

# Report of the Activities Conducted under Unnat Bharat Abhiyan at Amity University Haryana

**Project Coordinator-** Prof. Subhra Das, HoD, Solar Engineering Dept. Amity University Haryana

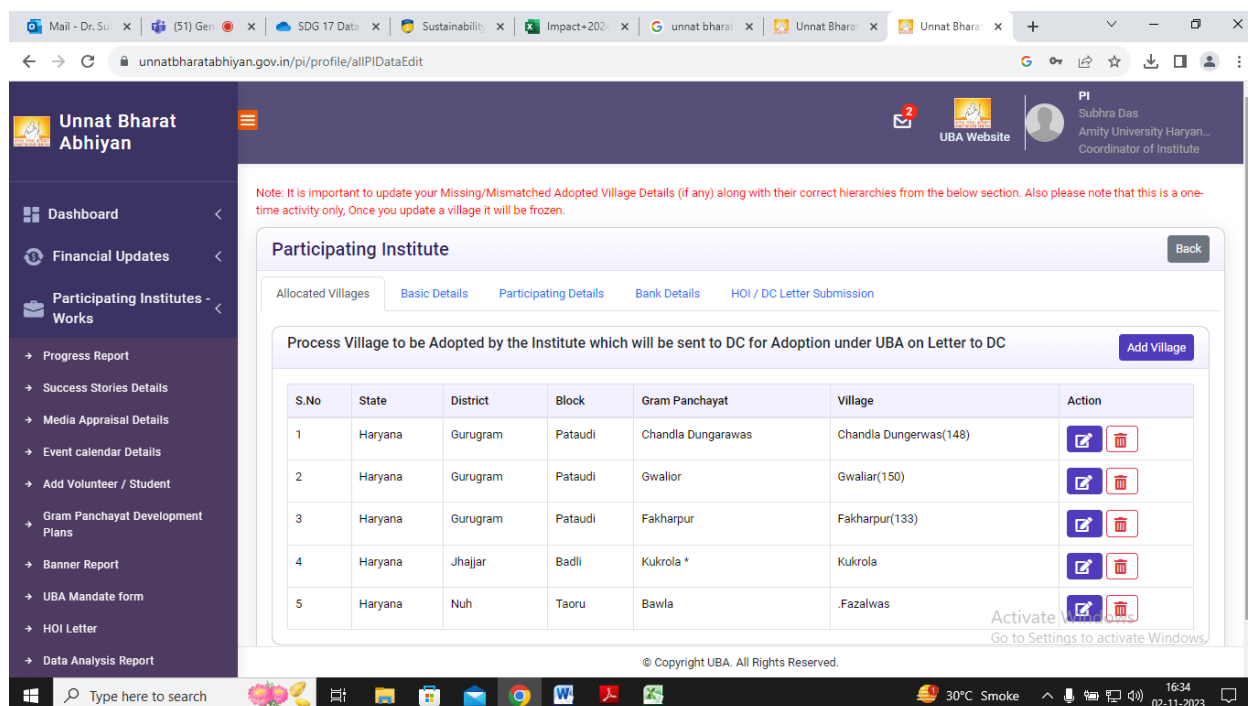
Ministry of Human Resources Development (MHRD), Government of India has launched the national program called Unnat Bharat Abhiyan (UBA), with the vision to involve professional and higher educational institutions in the development process of rural areas in the country to achieve sustainable development and better quality of life. Indian Institute of Technology, Hauz Khas, New Delhi has been designated to be the National Coordinating Institute by the Ministry.

**Amity University Haryana** has been selected to participate in UBA as a Participating Institute (PI) by MHRD. Under the UBA program AUH has selected the following five villages to conduct developmental activities:











1. Chandla
2. Fazalwas
3. Gwalior
4. Kukrola
5. Fakharpur

**Project Team:** Prof (Dr) Subhra Das (Project Coordinator), Dr Anil Yadav, Dr Luxita,

**Funding Organization:** Ministry of Human Resources Development (MHRD), Government of India



The screenshot shows the 'Participating Institute' profile page on the UBA website. The page includes a sidebar with navigation options like Dashboard, Financial Updates, and Participating Institutes - Works. The main content area displays a table of allocated villages for adoption, with columns for S.No, State, District, Block, Gram Panchayat, Village, and Action. The table lists five villages: Chandla, Gwalior, Fakharpur, Kukrola, and Fazalwas, all in Haryana. A note at the top of the table states: 'Note: It is important to update your Missing/Mismatched Adopted Village Details (if any) along with their correct hierarchies from the below section. Also please note that this is a one-time activity only. Once you update a village it will be frozen.'

S.No	State	District	Block	Gram Panchayat	Village	Action
1	Haryana	Gurugram	Pataudi	Chandla Dunganawas	Chandla Dunganwas(148)	 
2	Haryana	Gurugram	Pataudi	Gwalior	Gwalior(150)	 
3	Haryana	Gurugram	Pataudi	Fakharpur	Fakharpur(133)	 
4	Haryana	Jhajjar	Badli	Kukrola *	Kukrola	 
5	Haryana	Nuh	Taoru	Bawla	Fazalwas	 

Under UBA, Amity University Haryana has conducted the village survey and household survey of the five villages for building rapport with the Sarpanch, Panchayat members and understand the functioning of the village ecosystem, Anganwadi and Self-help groups. Interact with villagers and identify the problem areas for which we can provide some solution or support. Amity University Haryana propose to create awareness and provide solutions in the field of renewable energy, mental and physical health, nutrition, agriculture and skill development.

**The following activities were conducted in the five villages under Unnat Bharat Abhiyan:**

**ACTIVITY 1:**

**Title of the Activity: Meeting with Numberdaar & members of Panchayat of Gwalior village on 28<sup>th</sup> Sept, 2021**

**Need of the Activity:** To seek their approval for conducting development activities at Gwalior village

Meeting was attended by Mr Pope Singh, Numberdaar along with members of the Panchayat and faculty members Prof (Dr) Subhra Das, Dr Anil Yadav and seven staffs of Amity University Haryana.

**Impact:** Cooperation of Heads of Village for conducting household survey.

A positive attitude of the villagers towards the activity

Support from Anganbaari members in joining hands with Amity University Haryana for conducting development activities in the village.





**Meeting with Members of Panchayat**

## **ACTIVITY 2:**

**Title of the Activity: Household Survey at Gwalior**

**Need of the Activity: To understand the need of the villagers and the areas where Amity University Haryana can take up developmental activities.**

**Impact: Villagers are aware of UBA program and the role of Amity University Haryana**

Villagers are open to sharing their problems and, in some cases, they would personally call coordinators for help for their own personal issues.

Gain confidence of the villagers



## **ACTIVITY 3:**

**Title of the Activity: Meeting with Sarpanch & members of Panchayat of Fakharpur on 9<sup>th</sup> Nov, 2021**

**Need of the Activity: To seek their approval for conducting development activities at Fakharpur village**  
Meeting was attended by Mr Raj Singh, Sarpanch along with members of the Panchayat and faculty members Prof (Dr) Subhra Das, Dr Anil Yadav and seven staff members of Amity University Haryana.

**Impact: Cooperation of Heads of Village for conducting household survey.**

A positive attitude of the villagers towards the activity

Support from Anganbaari members in joining hands with Amity University Haryana for conducting development activities in the village.



**Meeting with Sarpanch and members of Panchayat of village Fakarpur**



**Members of Team UBA conducting the meeting**

**ACTIVITY 4:**

**Title of the Activity: Household Survey at Fakarpur Village**

**Need of the Activity: To understand the need of the villagers and the areas where Amity University Haryana can take up developmental activities.**

**Impact: Villagers are aware of UBA program and the role of Amity University Haryana**

Villagers are open to sharing their problems and, in some cases, they would personally call coordinators for help for their own personal issues.

Gain confidence of the villagers



#### **ACTIVITY 5:**

**Title of the Activity: Meeting with Sarpanch & members of Panchayat on 1<sup>st</sup> Oct, 2021**

**Need of the Activity:** To seek their approval for conducting development activities at Kukrola village Meeting was attended by Mr Ajay Kumar, Husband of Sarpanch Smt. Bala along with members of the Panchayat and faculty members Prof (Dr) Subhra Das and seven staff members of Amity University Haryana.

**Impact:** Cooperation of Heads of Village for conducting household survey.

A positive attitude of the villagers towards the activity

Support from Anganbaari members in joining hands with Amity University Haryana for conducting development activities in the village.

#### **ACTIVITY 6:**

**Title of the Activity: Meeting with Sarpanch & members of Panchayat on 4<sup>th</sup> Oct, 2021**

**Need of the Activity:** To seek their approval for conducting development activities at Fazalwas village

**Impact:** Cooperation of Heads of Village for conducting household survey.

A positive attitude of the villagers towards the activity

Support from Anganbaari members in joining hands with Amity University Haryana for conducting development activities in the village.

#### **ACTIVITY 7:**

**Title of the Activity: Meeting with Sarpanch & members of Panchayat on 27<sup>th</sup> Oct, 2021**

**Need of the Activity:** To seek their approval for conducting development activities at Chandla Dungerwas village

Meeting was attended by Mr Sube Singh, Sarpanch along with members of the Panchayat and faculty members Prof (Dr) Subhra Das and staffs of Amity University Haryana.

**Impact:** Cooperation of Heads of Village for conducting household survey.

A positive attitude of the villagers towards the activity

Support from Anganbaari members in joining hands with Amity University Haryana for conducting development activities in the village.



**Meeting with Sarpanch of Fazalwas**



**Meeting with Sarpanch of Fazalwas**



**Meeting with Family members of Numberdar of Chandla Dungerwas**

**ACTIVITY 8:**

**Title of the Activity:** Household Survey at Kukrola, Fazalwas and Chandla Dungerwas

**Need of the Activity:** To understand the need of the villagers and the areas where Amity University Haryana can take up developmental activities.

**Impact:** Villagers are aware of UBA program and the role of Amity University Haryana



Villagers are open to sharing their problems and, in some cases, they would personally call coordinators for help for their own personal issues.

Gain confidence of the villagers



**Interaction of AUH staff with Villagers**



**Interaction of AUH staff with Villagers**

**ACTIVITY 9:**

**Title of the Activity: Household Survey at Chandla Dunderwas.**

**Need of the Activity:** To understand the requirement of the villagers and rapport building.

**Impact:** Villagers got the confidence to share their problems with the team members and seek their guidance.

A positive attitude of the villagers towards the activity.

Support from Anganbaari members in joining hands with Amity University Haryana for conducting development activities in the village.



**ACTIVITY 10:**

**Title of the Activity: Household Survey at Fakarpur Village**

**Need of the Activity: To understand the need of the villagers and the areas where Amity University Haryana can take up developmental activities.**

**Impact:** Villagers are aware of UBA program and the role of Amity University Haryana

Villagers are open to sharing their problems and, in some cases, they would personally call coordinators for help for their own personal issues.

Gain confidence of the villagers



**ACTIVITY 11:**

**Title of the Activity: Social Awareness Program on Malnutrition in Children organized on 9<sup>th</sup> Dec 2021.**

**Need of the Activity:** Based on the household survey conducted by UBA team members it was observed that there is lack of awareness of the village women regarding the nutritional status of their children. In order to create awareness among the village women, children and men, the above stated program was conducted.



## ACTIVITY 12:

**Title of the Activity:** Solar Training Program organized on 2<sup>nd</sup> March 2022

**Need of the Activity:** Create awareness regarding solar PV systems, solar water heating systems and solar pumps.

Details of students, staff & faculty members who took part in this event are:

**B Tech 1<sup>st</sup> Year:** Anjan Ghosh, Saugat Chaudhury, Dheeraj Sharma, Jayesh Yadav, Bhupati Singh, Akshay Sharma

**M Tech SAE 1<sup>st</sup> Year-** Ms Twinkle Singhal

**M Sc RE 2<sup>nd</sup> year-** Ms. Shreya Bhattacharya

**B Tech 4<sup>th</sup> Year-** Mr Dalvir Singh

**Staff-** Mr Mohit, Mr Rakesh & Mr Himanshu

**Faculty-** Prof. Dr Subhra Das, Dr Anil Yadav

**Impact:** The villagers learnt about how they can meet the energy requirement for boiling water, electricity using solar systems.

Some of the ladies requested us to conduct such event at their parental villages so that the crisis of electricity can be met.



**Anganwadi workers, village women, students and faculty members who participated in the event**



**Mr Dalvir Singh, B Tech ECE Sem VIII describing the working of Rooftop solar PV**

### **ACTIVITY 13:**

**Title of the Activity: Nutritional Management in Malnutrition and Anemia among women and Children organized on 22<sup>nd</sup> March 2022 at Fakharpur village**

**Need of the Activity:** The objective of the event was to spread awareness about Malnutrition and Anemia in women & children and role of nutrition in prevention of the same.

**Impact:** Sarpanch of Fakharpur village Mr. Raj Singh provided full support by employing his peon to spread the news in the village. He provided support in gathering village women at the venue.

Women learnt about their BMI status and got counselling regarding their health issues. They were very satisfied.

Mr. Chaman Kishor, Numberdaar requested our team to conduct a program on drug abuse to save the young population from its bad effect.



**AUH Team of students and Faculty member during their journey to the venue.**



Ms Shivani & Ms Sanjana explaining the symptoms of malnutrition





**BMI Calculation Activity by students**

**ACTIVITY 14:**

**Title of the Activity: Prevention of Alcohol Addiction in Community organized on 3<sup>rd</sup> April 2022**

**Need of the Activity:** Create awareness regarding solar PV systems, solar water heating systems and solar pumps.

The following M. Phil. trainees participated in the program: Ms. Jesmeen , Ms. Pryanks, Ms. Divya, Ms. Sakshi, Ms. Vasudha, Ms. Pooja Jaiswal, Ms. Shefeen Jacob, Ms Ria Bhatia, Ms sheenu, Ms Vandana Hooda, Ms Kanak, Ms Pragya, Ms Parnika, Ms Steffi Jadhava, Ms Akanksha

**16 Participants from Fakharpur Village. Mr. Chaman Singh and about 30 community members**

**Impact:** Creating awareness about alcohol addiction

Strategies to prevent/cope with issues of alcohol addiction.



**Title of the Activity:** Speech and Hearing camp at Pt. Daulat Ram School, Pachgaon, near AUH Gurgaon on 18<sup>th</sup> May 2022

**Need of the Activity:** Camp for Hearing and Speech screening for students of primary school.

**Brief Description (Need/Impact/Action/Picture (if any)):**

The Department of Audiology and Speech-Language Pathology, Amity Medical School (AMS) organized Speech and Hearing camp at Pt. Daulat Ram School, Pachgaon, near AUH Gurgaon. The event was coordinated by Dr Vijay Kumar and Mr. Neelesh Benet (Assistant Prof. Audiology), AMS. Six students of BASLP namely Ms. Navya, Ms. Pratyusha, Mr. Aman, Mr. Nishant, Ms. Neha Sharma and Mr. Ziaul Mustufa participated in this event.

**Point wise highlights of the Event:**

1. Otoscopic Examination (Examination of outer ear) – 8 children, 12 adults (40 Ears)
2. Tuning fork Test based hearing screening - 6 children 12 adults
3. Impedance screening Audiometry - 8 children 12 adults
4. Pure tone Audiometry -8 children 12 adults
5. Number of children short listed for details assessment at AUH clinic. – 3 children, 2 adults

**Impact:** Free hearing check up for the school children and school staffs.

*They learn about their care and maintenance of ear, hearing and ear hygiene .*

**Photographs of the event**



# AMITY UNIVERSITY

GURGAON

Date: 11/05/22

To  
The Principal/Coordinator,

Pandit Daulat Ram  
Public School, Pachgaon, Manesar.

Subject: To conduct Hearing & Speech Screening Camp.

Dear Sir/Madam,

Department of Audiology & Speech-Language Pathology at Amity University Gurgaon Haryana propose to conduct a screening camp for hearing and speech problems such as a hearing loss, misarticulation, stammering, dyslexia (reading, writing deficit) etc. Generally, it has been reviewed that school children may suffer with these problems with relatively high prevalence rate. The screening will be conducted by the expert faculty/clinician of the AUH having experience of the same for more than 9-10 years. Post-screening intervention /counseling will be provided to the children in need.

You may allow conducting the same; by doing so we may ensure healthy hearing, speech & language in children which will assist in strengthening the essence of success.

Healthy regards,

Dr. Vijay Kumar  
HOD  
Department of Audiology & Speech-Language Pathology  
Amity Medical School  
Amity University Gurgaon



# Permitted on 18/5/2022.  
- Amal Pathi  
12/5/2022  
9312644101.  
PDRPS, Pachgaon.

Fig 1. Permission from School Principal



Fig2. Students and Faculty members at the Camp



**Fig 3:** Student taking part in the Hearing Check-up of the staffs



**Fig 4:** Student taking part in the Hearing Check-up of teachers



**Fig 5:** Student taking part in the Hearing Check-up of children



Fig:6 Student taking part in the Speech and Hearing Check-up of children



Fig 7: Student taking part in the Speech and Hearing Check-up of children



Fig8 : Group Photograph of the AUH students and faculty members with some of the school children



**Fig9:** Group Photograph of Faculty and students who participated from Amity University Haryana for the Hearing and Speech Checkup camp at Daultram School

**Title of the Activity: 3 Days Training for Solar Sales Representative organized by Solar Engineering Department and Department of Electronics and Communication Engineering in collaboration with Greenroots Renewable Energy Pvt Ltd. The event was conducted from 21<sup>st</sup>- 23<sup>rd</sup> Nov. 2022 at Amity University Haryana in Smart Classroom C 214**

**Need of the Activity:** Create business development executives for the solar industry which will lead to employment in solar industry.

**Brief Description (Need/Impact/Action/Picture (if any)):**

The Solar Engineering Department and Department of Electronics and Communication of Amity School of Engineering and Technology, Amity University Haryana, Gurgaon in collaboration with Greenroots Renewable Energy Pvt Ltd. Organized the 3 days solar technical sales representative training program at Amity University Haryana. The event was convened by Prof. Subhra Das and Prof. Anil Yadav (Associate Professor) and faculty from Engineering and Management School joined hand in delivering the lectures for the event. Ms. Twinkle Singhal (student of M Tech Solar and Alternate Energy, Sem III) and Ms. Anasooya Jayraman (student of M Sc Renewable Energy, Sem I) coordinated the training session.

The program started with an Opening Remarks by Prof. Subhra Das who explained the attendees the need and the objectives of the training program. Prof. H. P Yadav, HoD Civil Engineering delivered the Welcome address and emphasised the vision of Hon. Prime Minister's vision to achieve Net Zero by 2070 and the role of HEIs in achieving the ambitious target. Prof. Yadav welcomed the industry partner Mr. Anup Arora and felicitated him with a Tulsi sapling and flower bouquet. He was joined by Maj Gen (Dr) J S Dhull, Prof. Subhra Das and Dr Luxita Sharma to welcome the industry partner.

Technical session on Day1 started with Mr. Anup Arora's lecture on Solar PV design and installation. He discussed the different types of solar rooftop PV powerplants and the designing aspects. Field visit to 185kWp ground mounted solar PV power plant was conducted and Mr. Arora explained the design of the system and the functions of each of the components.

On the Day 2, Dr Anil Yadav delivered the lecture on Cost of Solar PV systems, Cost Benefit Analysis, Environmental Benefits. Dr Subhra Das delivered the lecture on Introduction to Solar PV, the various products, factors affecting its performance and working of the systems, Components of Solar Systems. At the end of day 2, the student had an understanding of solar photovoltaic systems, how it works and the performance of these systems under different conditions and the cost of these systems.

Day 3 started with a lecture by Dr Tanushree Purohit who discussed the traits of business development. The skills required for handling a customer, understanding the requirement, providing solution, methods of convincing the customer narrating success stories/ making him understand the benefits. This was followed by a lecture by Dr Ved Prakash who delivered a lecture on Site Requirement, Design & Installation requirements of solar PV systems.

Dr Subhra Das delivered a lecture on the Government Policies related to solar projects and products and showed them the official website which can be used to apply for subsidies. The technical session was followed by a quiz which was conducted by rearranging the entire class of students into mixed groups. Every member of the group was required to answer for scoring marks. This helped peer learning and building confidence among the trainees.

Hon. Pro Vice Chancellor Prof. Vikas Madhukar blessed the students and emphasized on the importance of 3 Es- Effectiveness, Efficiency and experience for business development and execution. Prof. Madhukar then distributed the certificates to the students and the faculty coordinators.

**There were 29 participants which included candidates from the nearby villages and students Sciences, Engineering and Architecture School of Amity University Haryana Village.**

**Impact:** After the completion of the training, the trainees were aware about the different solar energy systems Government Policies and Subsidies that are available for the installing RE systems.

Employment of one candidate at Greenroots Renewable Energy Pvt Ltd.

AUH students showed interest in adapting the clean sources of energy for meeting the energy requirement and also the considering these options while designing new projects.

**Attendance Sheet of the Participants**



# AMITY UNIVERSITY

HARYANA

**Amity School of Engineering & Technology**  
Solar Engineering Department & Department of Electronics & Communication Engineering

in Collaboration with  
**Greenroots Renewable Energy Pvt Ltd**  
Under Unnat Bharat Abhiyan is organizing  
**3 Days Training for Solar Technical Sales Representative**  
November 21-23, 2022  
Venue: Smart Classroom, C 214

S.No	Name	Phone	Day 1	Day 2		Day 3	
			21/11	22/11/22	TS4	TS5	
			TS1	TS2	TS3	TS4	TS5
1	Twinkle Singhal	8279728300	Twinkle	Twinkle	Twinkle	Twinkle	Twinkle
2	Anasooya Jayaraman	9388923163	An	An	An	An	An
3	Manan Kaur Ghai	9893984675					
4	Ibrahim Alam	7209009314	Ibrahim	Ibrahim	Ibrahim	Ibrahim	Ibrahim
5	Narender	9050823940	Narender	Narender	Narender	Narender	Narender
6	Ms. Ritu	9319951775	Ritu	Ritu	Ritu	Ritu	Ritu
7	Chandan	9958440374	Chandan	Chandan	Chandan	Chandan	Chandan
8	Kamal	7428084828	Kamal	Kamal	Kamal	Kamal	Kamal
9	Deepak	9350093128	Deepak	Deepak	Deepak	Deepak	Deepak
10	Shivendu Kumar	9199505399					
11	Rohit Kumar	9306038696	Rohit	Rohit	Rohit	Rohit	Rohit
12	Geetika Jangid	9138121911	Geetika	Geetika	Geetika	Geetika	Geetika
13	Sonia Rawat	6280897425					
14	Simran Singhal	8700893500					
15	Sonia	9992440854	Sonia	Sonia	Sonia	Sonia	Sonia
16	Durga	8168796024	Durga	Durga	Durga	Durga	Durga
17	Akshay	8708840035	Akshay	Akshay	Akshay	Akshay	Akshay
18	Geeta	9817565746	Geeta	Geeta	Geeta	Geeta	Geeta
19	Pooja	7011630200					
20	Sourab	8607660893					
21	Shubham Tyagi	8076082629	Shubham	Shubham	Shubham	Shubham	Shubham
22	Sahil Khan	7303220377	Sahil	Sahil	Sahil	Sahil	Sahil
23	Taksh Brar	8219881850	Taksh	Taksh	Taksh	Taksh	Taksh
24	Manasi Dixit	6389572327	Manasi	Manasi	Manasi	Manasi	Manasi
25	Meetha Kheri	9560112117	Meetha	Meetha	Meetha	Meetha	Meetha
26	Sonia	6280897425	Sonia	Sonia	Sonia	Sonia	Sonia
27	Simran	8700893500	Simran	Simran	Simran	Simran	Simran
28	Shubham	6280897425	Shubham	Shubham	Shubham	Shubham	Shubham
29	Aishwariya	979782753	Aishwariya	Aishwariya	Aishwariya	Aishwariya	Aishwariya

Scanned by CamScanner

Photographs with caption





Solar Engineering Department and Department of Electronics & Communication Engineering  
in Collaboration with  
Greenroots Renewable Energy Pvt Ltd  
Under Unnat Bharat Abhiyan is Organizing

3 days Training for Solar Technical Sales Representative from 21<sup>st</sup> -23<sup>rd</sup> Nov 2022

Topics that will be covered are:

- Product- Standalone system, Off grid solar PV, Rooftop solar PV
- Site Assessment, Customer Handling
- Cost of the Product
- Financial Benefits & Subsidies
- Government Policies

**Eligibility:** MBA, BBA, B Sc, BA, ITI/Diploma, 12<sup>th</sup> pass

**Age:** No age limit

**Fees:** Rs. 500/- . Free for AUH students.

**Duration:** 9.30AM - 1PM

**Resource Persons:** Dr. Subhra Das (Prof. & HoD, Solar Engg Dept), Dr Anil Yadav (HoD, ECE Dept.), Dr Ved Prakash (Asst. Prof., ECE Dept), Dr Tanushree Purohit (HoD, Amity Skills Institute) from Amity University Haryana  
Mr. Anup Arora, Founder & Director, Greenroots Renewable Energy Pvt. Ltd

Link for Registration:

<https://forms.gle/LeNUZ6ZVfaMJYCAo9>

Address Amity University Haryana, Gurugram,  
Manesar, Panchgaon, Haryana 122412

<https://goo.gl/maps/ta7zWZ277V95QwtTA>

Fig 1. Flyer of the Event



Fig2. Inaugural Session- Opening Remarks by Prof. Subhra Das



**Fig 3:** Technical Session 1- Lecture by Mr. Anup Arora, Director, Greenroots Renewable Pvt Ltd.



**Fig 4:** Field Visit to 185kWp Solar PV power plant at AUH



**Fig 5:** Group Photograph of all Trainees and faculty members and Staffs



Fig:6 Technical Session by Dr Anil Yadav

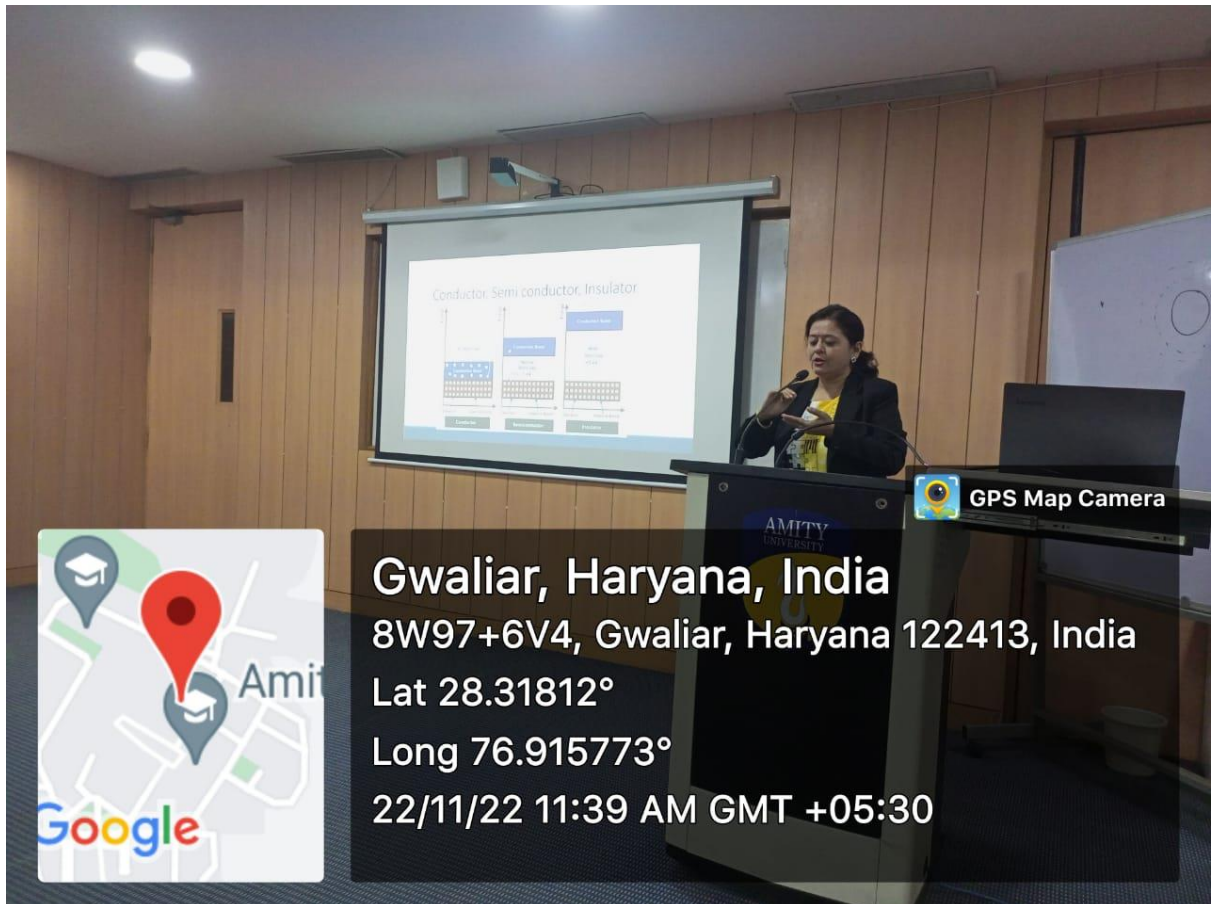


Fig 7: Technical Session by Prof. Subhra Das



**Fig8 :** Certificate Distribution by Prof. Vikas Madhukar, Hon. Prov Vice Chancellor, AUH to Ms. Durga. He is joined by the faculty coordinators of the event Dr Subhra Das, Dr Anil Yadav and Dr Tanushree Purohit



**Fig9:** Certificate Distribution by Prof. Vikas Madhukar, Hon. Prov Vice Chancellor, AUH to Mr. Deepak.. He is joined by the faculty coordinators of the event Dr Subhra Das, Dr Anil Yadav and Dr Tanushree Purohit.

He got placed in Greenroots Renewable Energy Pvt Ltd after completion of the training program.



Fig. 10: Group Photograph of the Trainees with Hon. Pro Vice Chancellor Prof. Vikas Madhukar, Prof. Subhra Das, Dr Anil Yadav, Dr Tanushree Purohit.



AMITY  
UNIVERSITY  
— GURUGRAM —

In  
Association  
with



LEED LAB  
CURRICULUM





## LEED LAB @ AMITY

Amity University being a leader in education has expanded his vision towards the sustainable and green building design and construction. Amity approach of education is to prepare students for 21st century careers by delivering competency-based education and innovative solutions by preparing the industry based syllabus and curriculum. Amity University Haryana Campus has three academic blocks which are certified as LEED PLATINUM for its green building design, operation and maintenance, the highest rating provided by LEED (Leadership in Energy and Environmental Design), USGBC (U.S. Green Building Council) in July 2017; very first educational Institute building in India and 2nd only in Asia. The LEED is the most widely used third party verification for green buildings incorporating highest levels of green parameters in use of materials, construction technology, use of natural light but are also operated and maintained with highest standards of energy efficiency. LEED is a framework to provide a life cycle of building from construction to operation by connecting our daily activities to the impacts they have on our planet. It also provides an opportunity to transform the built environment to green building.

Amity University has joined hand with GBCI to train and educate students to cater the upcoming industry need of green building by initiating an educational module; LEED Lab. 'LEED Lab' is a unique academic initiative which integrates a policy framework to classroom activity to get desired outcome in arena of sustainable built environment. Way forward the university has decided to start a 'LEED Lab' for this noble cause of ensuring sustainability. It is a key educational tool connecting students' passion for sustainability with their academic pursuits. It will help to equip next generation of sustainability advocates with the practical experience needed to differentiate them in today's job market. Through this programme students will be trained for Green building framework through class room activity along with project on existing building of AUH campus and their monitoring and assessment of existing building provide performance score of said building. At the end of the course students will be prepared for taking the exams of 'LEED Green Associate' and LEED Accredited Professional'.





# TEAM

## LEED LAB COACH:

- Prof. (Dr.) Padmakali Banerjee  
Pro Vice Chancellor  
Amity University Haryana

## LEED INSTRUCTORS:

- **Kushagra Rajendra, Ph.D (Team lead)**
- Ar. Nishant Nathani
- Ar. Geetika Verma
- Ar. Arun Bhandari
- Er. Hardik Saxena
- Dr. Praveen Kumar
- Ar. Meghna Vij
- Ar. Dilip Kushwaha
- Ar. Saloni Chadda

## ACADEMIC SUPPORT:

- Priyanka Kochhar  
Regional Manager  
Market Transformation, GBCI
- Prof. (Dr.) Bhavna Adhikari  
Dy. Dean, Academics  
Amity University Haryana
- Mr. Ravish Dhingra  
OSD  
Pro Vice Chancellor Office  
Amity University Haryana

## ELIGIBILITY:

UG/PG in Architecture, Planning, Civil Engineering, Environmental Sciences, Environmental Engineering and related disciplines





# COURSE MANUAL - LEED LAB

**Subject: LEED Lab    Credits: 3**

## **COURSE OVERVIEW**

Course Objective: LEED Lab is an attempt to train students for green building concepts and inculcate required skills for understanding of different aspect and parameters related to green building certification process. The teaching methodology is based upon, basic understanding of green building, followed by LEED requirements and processes of obtaining the LEED certification added with field/building based activities. Pedagogy is designed in a manner to utilize ICT tools to widen subjects understanding in an interactive manner. The curriculum is prepared in a way to give equal weightage to both theory and practical with adoption of continuous assessment through entire course period . Modules are planned to incorporate at least one live/case based demonstration as per requirement of LEED certification.

## **LEARNING OUTCOMES:**

This course is designed to produce the following outcomes:

1. The student will able to understand the technical aspects of green building, and national and international certification frameworks.
2. Student will able to assess and explore techniques to improve building exterior, site, water , energy consumption, remodeling, waste management, and procurement of materials for green building.
3. Recognize how improving building operation and maintenance lead to higher performance in green buildings.
4. Understand green building certification: pre-requisites, credits and the tools needed for implementation, and recognize synergies between multiple credits with special reference to LEED-EB: O+M
5. Students' ability to assess the performance of existing buildings and facilitate LEED for Existing Buildings: Operations and Maintenance (LEED EB: O+M) (through Arc performance pathway) process with the goal of certifying the facility such as registration, submission, and LEED online interface, will be strengthened.
6. At the end of the semester the students are prepared to appear for the LEED professional credential (i.e. LEED Green Associate and/or LEED Accredited Professional).



### COURSE PLAN:

The syllabus is well demarcated among ten different modules to cover basic concepts of green building with special emphasis on LEED certification for O & M (Existing Building). Each module is designed to cover fundamental information, followed by LEED requirements and practical activities such as site data collection and analysis, field visits, documentation and existing building based projects under heading of LEED live.

S.No.	Modules	Lectures Hours
1.	Module I Introduction to Green Building	3
2.	Module II Green Building Rating Systems	2
3.	Module III LEED Lab and Processes	5
4.	Module IV Site, Location and Transportation	3
5.	Module V Material and Resources	3
6.	Module VI Energy and Climate	5
7.	Module VII Water Efficiency/Environment	4
8.	Module VIII Indoor Environment & Human Comfort	3
9.	Module IX LEED Arc Platform	5
10	Module X Project Communication	3

### ASSESSMENT AND EVALUATION:

Based upon interactive pedagogy, students will be engaged in the continuous teaching-learning environment for an entire course period, including classroom lecture, discussions, guest lectures, field visit, outdoor activities, quiz and tutorials. Hence the evaluation is based upon their performance in every learning activity designed for the course curriculum.

Component Code	CA	PE	A	EE
Weightage Planned (%)	20	25	5	50



## SESSION PLAN: LEED Lab (Total No Sessions - 36)

Module	Content	LEED Live	Lecture Hours
<b>Introduction to Green Building</b>	<ul style="list-style-type: none"> <li>• Introduction to Course, Syllabus and assessment</li> <li>• Fundamental concepts of Green Building Design and Sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• Home Assignment: Importance of Green Building and its benefits</li> <li>• Comparison of green and conventional building</li> </ul>	1-3
<b>Green Building Rating Systems</b>	<ul style="list-style-type: none"> <li>• Green Rating regime and their scope (regional and global)</li> <li>• Policies and legislations</li> </ul>	<ul style="list-style-type: none"> <li>• Case study: Different rating systems</li> <li>• Green building Operations Guide</li> <li>• Field visit: Any green certified building</li> </ul>	4-5
<b>LEED Lab &amp; Processes</b>	<ul style="list-style-type: none"> <li>• LEED Systems: Organization, fundamentals &amp; Role USGBC/GBCI</li> <li>• Structure of LEED rating (credit, prerequisites and requirements) and Impact categories</li> <li>• LEED Certification &amp; registration process</li> <li>• What, How and where to collect data for LEED certification</li> </ul>	<ul style="list-style-type: none"> <li>• Survey format and questionnaire</li> <li>• Physical case study: existing LEED certified building</li> <li>• File preparation for a LEED project (Registration document collection)</li> <li>• Quiz</li> </ul>	6-10
<b>Site, location and Transportation</b>	<ul style="list-style-type: none"> <li>• Scope and criterion of sustainable site.</li> <li>• Transport and resource footprint</li> </ul>	<ul style="list-style-type: none"> <li>• Transport survey (Origin-Destination, Parking, mode of transport)</li> <li>• Group discussion on site suitability (site: AUH Campus)</li> </ul>	11-13
<b>Material and Resources</b>	<ul style="list-style-type: none"> <li>• Fundamental concepts (LCA, Waste management, 3Rs and Health)</li> <li>• Procurement, declarations and documentations of Materials according to requirement of LEED certification</li> </ul>	<ul style="list-style-type: none"> <li>• Tutorial: bills, collection and calculations of Material in resources in building</li> </ul>	14-16



<b>Energy and Climate</b>	<ul style="list-style-type: none"> <li>• Basic concepts I (Building loads, Energy efficiency, Environmental concerns)</li> <li>• Basic concept II (Electrical systems, Visual &amp; thermal comfort and other concepts)</li> <li>• Energy commissioning &amp; performance management</li> <li>• Energy audit process, equipment and tools</li> </ul>	<ul style="list-style-type: none"> <li>• Team exercise 1: Data collection, reporting, preparation of site energy audit</li> <li>• Team exercise 2: Comparison between Design based report (DBR) and Performance based report (PBR)</li> <li>• Field visit: LEED certified building</li> </ul>	17-21
<b>Water Efficiency/ Environment</b>	<ul style="list-style-type: none"> <li>• Water use pattern, source and conservation scope (including water harvesting and treatment)</li> <li>• Water flow, fixtures and plumbing networks and water efficient appliances</li> <li>• Water Audit: Performance management and monitoring</li> <li>• LEED requirement and documentation plan</li> </ul>	<ul style="list-style-type: none"> <li>• Tutorial: water based calculations for LEED pre-requisites</li> <li>• Team exercise: Data collection, reporting, preparation for Water audit</li> <li>• Field exercise: Visit to STP for data collection (Site: AUH)</li> </ul>	22-24
<b>Indoor Environment &amp; Human Comfort</b>	<ul style="list-style-type: none"> <li>• Fundamentals of Indoor environmental quality (ventilation, air quality, indoor emission, green cleaning)</li> <li>• Health and occupational comfort (Natural lighting, Thermal, Quality view &amp; assessment-survey)</li> </ul>	<ul style="list-style-type: none"> <li>• Project based assessment of existing building</li> <li>• Class activity: Micro-climate improvement scope and use of instruments to monitor air quality</li> </ul>	25-27
<b>Arc Platform: Data collection for LEED certification</b>	<ul style="list-style-type: none"> <li>• Basic concepts and pre-requisites.</li> </ul>	<ul style="list-style-type: none"> <li>• Outdoor activity: live ARC interface</li> <li>• Team Activity: Working on live interface by uploading data</li> </ul>	28-32
<b>Project Communication</b>	<ul style="list-style-type: none"> <li>• Environmental/Building codes</li> <li>• Impact of built environment, sustainable &amp; regional design</li> <li>• Project Documentation follow up</li> </ul>	<ul style="list-style-type: none"> <li>• Class quiz: Building codes</li> <li>• Project Report: Comparison and compilation of all case studies</li> </ul>	33-36



# READINGS

1. Energy-efficient buildings in India, The Energy and Resources Institute (TERI), 2001
2. GRIHA MANUAL: Five volume set, The Energy and Resources Institute (TERI), 2011
3. Green Building: Guidebook for Sustainable Architecture, Springer, ed 2010
4. Green Building A to Z: Understanding the Language of Green Building, New Society Publishers, 2007
5. U.S. Green Building Council. Green Building and LEED Core Concepts Guide. 3rd Edition. U.S. Green Building Council, 2014.
6. U.S. Green Building Council. Introductory and Overview Sections. LEED Building Design + Construction Reference Guide. v4 Edition. U.S. Green Building Council, 2013.
7. U.S. Green Building Council. LEED Operations and Maintenance Reference Guide. v4 Edition. U.S. Green Building Council, 2013.
8. Green Building Incentive strategies, US Green Building Council 2014
9. US Green Building Council LEEDv4 for operations and maintenance checklist. US Green Building Council, 2013
10. U.S. Green Building Council. LEED v4 Impact Category and Point Allocation Process, Overview. U.S. Green Building Council, 2013.
11. LEED Online: Register a project. US Green Building Council 2014
12. "Rating System Selection Guidance" U.S. Green Building Council 2014
13. U.S. Green Building Council. LEED v4 User Guide. U.S. Green Building Council, 2013.
14. U.S. Green Building Council. Guide to LEED Certification: Commercial. U.S. Green Building Council, 2014.
15. "Rating System Selection Guidance." U.S. Green Building Council, 2014.
16. "Addenda Database." U.S. Green Building Council.



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## 13208 M.Tech.- Solar and Alternate Energy (Total Credits-100)

### Programme Structure-2020

#### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
SAE4101	Renewable Energy Conversion Systems	3	-	-	3
SAE4102	Basics of Mechanical Engineering	4	-	-	4
SAE4103	Basics of Electronic Devices & Circuits	4	-	-	4
SAE4104	Instrumentation Techniques & Characterization	4	-	-	4
SAE4106	Biomass	4	-	-	4
<b>SAE4107</b>	<b>Basics of Mechanical Engg Lab</b>	-	-	<b>2</b>	<b>1</b>
<b>SAE4108</b>	<b>Electronics Lab</b>	-	-	<b>2</b>	<b>1</b>
<b>Open Electives</b>					<b>5</b>
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
	Foreign Business Language-I	3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I **				
<b>TOTAL</b>					<b>26</b>

\*\* Hindi as Foreign Language for Foreign National Students

#### SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
SAE4201	Solar Thermal Engineering: Conversion and Storage; Flat plate Collectors and Concentrators	4	-	-	4
SAE4202	Solar Photovoltaic cells: Physics & Fabrication Technique	4	-	-	4
SAE4203	Solar Energy Storage Systems	3	-	-	3
SAE4204	Energy Management related to Renewable Energy Systems	3	-	-	3
<b>SAE4206</b>	<b>Solar PV Lab</b>	-	-	<b>4</b>	<b>2</b>
SAE4210	Lab Project	-	-	-	2
	<b>Elective-I (Without Lab) Any One</b>				<b>4</b>
SAE4205	Financial Evaluation of Renewable Energy Technologies	3	1	-	4
SAE4207	Renewable Energy for Heat Applications	3	1	-	4
SAE4208	Wind Energy	3	1	-	4
SAE4209	Organic Photovoltaic	3	1	-	4
SAE4211	Energy Access and Planning	3	1	-	4
SAE4212	Risk Management in Renewable Energy Projects	3	1	-	4
SAE4213	Fundamentals of Nuclear Power Generation-I	3	1	-	4
	<b>Open Electives</b>				<b>5</b>
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication & Relationship Management	1	-	-	1
	Foreign Business Language-II	3	-	-	3
LAN4251	French-II				
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
LAN4259	Hindi-II				
	<b>TOTAL</b>				<b>27</b>



**SUMMER PROJECT  
THIRD SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per Week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
SAE4301	Modelling and Simulation of Solar Thermal Systems	4	-	-	4
SAE4302	Design & Engineering of Solar PV Cells and Panels	4	-	-	4
SAE4309	Large Scale Grid Integration of Renewable Energy Sources	4	-	-	4
SAE4310	Solar and Wind Energy Meteorology	3	-	-	3
<b>SAE4305</b>	<b>Solar Thermal Lab</b>	-	-	<b>4</b>	<b>2</b>
SAE4335	Summer Internship Evaluation	-	-	-	6
	<b>Elective-II (Without Lab) Any One</b>				<b>4</b>
SAE4306	Biofuels & Biomethanation	3	1	-	4
SAE4307	Wind Energy: Energy Conversion & Design of Turbines and Small Hydro Systems	3	1	-	4
SAE4311	Designing of Solar Projects	3	1	-	4
SAE4312	Thermoelectric Systems and Devices	3	1	-	4
SAE4313	Smart Grids and Renewable	3	1	-	4
SAE4314	Advanced Energy Systems	3	1	-	4
SAE4315	Fundamentals of Nuclear Power Generation-II	3	1	-	4
	<b>Open Electives</b>				<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	Foreign Business Language-III	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
LAN4359	Hindi-III				
	<b>TOTAL</b>				<b>31</b>

## FOURTH SEMESTER

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Self Study</b>	<b>Total Credits</b>
SAE4401	Energy Policy	3	-	-	-	3
SAE4402	Green Buildings	3	-	-	-	3
SAE4437	Dissertation /Seminar & Progress Report /Comprehensive Viva	-	-	-	-	10
	<b>TOTAL</b>					<b>16</b>

Master of Science Renewable Energy

**FLEXILEARN**

-Freedom to design your degree



Programme Structure

Curriculum & Scheme of Examination

2020-21

AMITY UNIVERSITY HARYANA

GURGAON

# M.Sc.-Renewable Energy (Total Credits-100)

## Programme Structure

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
RWE4101	Renewable Energy Conversion systems	3	-	-	3
RWE4102	Introduction to Solar Photovoltaics	3	1	-	4
RWE4103	Introduction to Solar Thermal Technology	3	1	-	4
RWE4104	Biomass	3	1	-	4
RWE4106	Field Work I/Seminar I				1
<b>RWE4107</b>	<b>Solar Radiation Measurement &amp; analysis Lab</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>2</b>
Open Electives					5
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self-Development and Interpersonal Skills	1	-	-	1
	Foreign Business Language-I	3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I**				
<b>TOTAL</b>					<b>23</b>

\*\*Hindi as Foreign Language for Foreign National Students

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
RWE4201	Solar Thermal Systems	4	-	-	4
RWE4202	Fabrication of Solar Cells: Material and designing aspects	4	-	-	4
RWE4203	Instrumental techniques and characterization	4	0	-	4
RWE4204	Energy Storage	3	-	-	3
RWE4205	Solar PV & Thermal Lab	-	-	4	2
Electives (without lab)					4
RWE4206	Financial Evaluation of Renewable Energy Systems	3	1	-	4
RWE4207	Energy access and planning	3	1	-	4
RWE4208	Wind Energy	3	1	-	4
RWE4209	Risk management in renewable energy projects	3	1	-	4
RWE4210	Fundamentals of Nuclear Power Generation I	3	1	-	4
Open Electives					5
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication and Relationship Management	1	-	-	1
	Foreign Business Language-II	3	-	-	3
LAN4251	French-II				
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
TOTAL					26

SUMMER INTERNSHIP – (8-10 WEEKS)

### THIRD SEMESTER

	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
RWE4301	Modelling and simulation of solar Thermal systems	4	-	-	4
RWE4302	Designing of Solar Rooftop Grid/Off-grid PV System	4	-	-	4
RWE4303	Large Scale Grid Integration of Renewable energy Sources on	3	1	-	4
RWE4304	Solar and wind energy meteorology	3	-	-	3
RWE4305	Solar Power generation Lab	1	1	4	2
RWE4335	Field Work II/ Minor Project II/Seminar II	-	-	-	1
RWE4306	Summer Internship Evaluation	-	-	-	6
	Electives (without lab)				4
RWE4307	Designing of Solar projects	3	1	-	4
RWE4308	Thermoelectric Systems and Devices	3	1	-	4
RWE4309	Biofuels and Biomethanation	3	1	-	4
RWE 4310	Smart grids and renewables	3	1	-	4
RWE4311	Wind Energy: Energy Conversion and Design of Turbines	3	1	-	4
RWE4312	Fundamentals of Nuclear Power Generation II	3	1	-	4
	Open Electives				4
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	Foreign Business Language-III	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
	TOTAL				32

### FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Self Study	Total Credits
RWE4401	Energy Management	3	-	-		3
RWE4402	Energy policy	3	-	-		3
RWE4403	Green Buildings	3	-	-		3
RWE4437	Dissertation /Seminar & Progress Report /Comprehensive Viva	-	-	-	-	10
	<b>TOTAL</b>					<b>19</b>

PSO1	PSO2			PSO3		PSO4	
Apply knowledge and understanding of the scientific principles, physics and engineering to analyze relevant current technologies, and applications of the key engineering principles and practices related to renewable energy technology and management.	Understand the advanced technical knowledge, current available software, modelling techniques, computational methods, management skills and other applications and using them to solve the real-world problems in renewable energy sector following the standard codes of practice.			Ability to understand and evaluate user needs, including considerations such as energy policy requirement, energy availability & management, associated risks, etc. and design of renewable energy power generation systems keeping in view the environmental issues, risk assessment, social, safety and sustainability by functioning in multidisciplinary teams.		Understanding the need of high level professional, management techniques including project management which can be used in technological and management practices in construction following the ethical code of conduct as well as understanding the impact of engineering practices on societal, global, commercial and economic scenario.	
Basic Engineering/ Renewable Energy Technology	Technology	Energy Management & Project Finance	Applications	Energy Planning & Risk Management	Designing Simulation	NTCC Courses	Value Added Courses
Renewable Energy Conversion systems	Solar Thermal Systems	Energy Management	Renewable energy for heat applications	Risk management in renewable energy projects	Modelling and simulation of solar thermal systems	Summer Internship	Basics of Communication

Introduction to Solar PV	Fabrication of solar cells: Material & Designing aspects	Financial Evaluation of renewable energy systems	Organic Photovoltaic	Energy Access and Planning	Designing of solar rooftop grid/off grid pv systems	Lab Project	Self Development & Interpersonal Skills
Introduction to Solar Thermal Technology	Solar Energy storage		Solar and wind energy meteorology	Energy policy	Large Scale Grid Integration of Renewable energy Sources	Dissertation /Seminar & Progress Report /Comprehensive Viva	Corporate Communication
Instrumental analysis	Wind Energy		Green Buildings		Wind energy: Energy Conversion & Design of turbines	Field work I & II	Behavioral Communication & Relationship Management
	Solar PV & thermal lab				Designing of Solar projects		Interpersonal Communication
	Solar Radiation Measure & Analysis Lab				Smart Grids and Renewables		Leading Through Teams
	Biofuels & Biomethanation				Fundamentals of Nuclear Power Generation II		
	Thermoelectric Systems and Devices				Solar Power Generation Lab		
	Advanced Energy Systems						
	Fundamentals of Nuclear Energy I						



**AMITY UNIVERSITY HARYANA**  
**AMITY SCHOOL OF APPLIED SCIENCES**  
**DEPARTMENT OF SOLAR ENGINEERING**

**PROPOSED TRACK: RENEWABLE ENRGY**

<b>Track</b>	<b>Track with details of courses/course code</b>	<b>No. of credits earned for getting a minor degree</b>	<b>Prerequisites if any</b>
<b>Renewable Energy</b>	<b>Semester I:</b> SAE 2151- Renewable energy conversion systems	<b>18</b>	<b>No prerequisites</b>
	<b>Semester II:</b> SAE 2251- Introduction to solar thermal engineering		
	<b>Semester III:</b> SAE 2351- Introduction to solar photovoltaic		
	<b>Semester IV:</b> SAE 2451- Energy from wastes		
	<b>Semester V:</b> SAE 2551- Renewable energy for heat applications		
	<b>Semester VI:</b> SAE 2651- Energy audit and energy management		

# Curriculum & Scheme of Examination

## RENEWABLE ENERGY CONVERSION SYSTEMS

**Course Code:** SAE 2151

**Credit Units: 03**

### **Course Objective:**

Course provides introduction to different renewable energy sources.

Analyze the full range of renewable energy supplies needed for modern economies. Course will include power from sunshine, wind, and biomass.

### **Course Content**

#### **Module I**

Principles of renewable energy, fundamentals, scientific principles of renewable energy, technical implications, social implications.

#### **Module II**

Solar radiation: Extraterrestrial solar radiation, components of radiation, geometry of earth and sun, geometry of collector and solar beam, measurements of solar radiation  
Solar water heating system, solar air heaters, solar concentrators

#### **Module III**

Photovoltaic generation: Introduction, silicon p-n junction, photon absorption, solar radiation input, photovoltaic circuit properties and loads, limits to cell efficiency

#### **Module IV**

Principles of Ocean thermal energy conversion, Principles of Geothermal energy conversion, suitable sites and criteria, Advantages and disadvantages.

### **Examination Scheme:**

<b>Components</b>	<b>CT</b>	<b>Assignment</b>	<b>V/Q</b>	<b>Attendance</b>	<b>EE(1)</b>
<b>Weightage (%)</b>	15	5	5	5	70

### **Text & References:**

- Renewable energy resources – J. W. Twidell
- Renewable energy engineering and technology-edited by V. V.N. Kishore
- Directory, Indian Windpower 2004, CECL, Bhopal.

# INTRODUCTION TO SOLAR THERMAL ENGINEERING

**Course Code:** SAE 2251

**Credit Units: 03**

## **Course Objective:**

To cover areas related with the fundamentals of solar energy, storage, and design of solar appliances.

## **Course Contents:**

### **Module I: Introduction**

Solar spectrum, solar radiation, instruments (pyrheliometers, pyranometers), solar radiation on horizontal surface (estimation of average solar radiation, estimation of clear sky radiation), solar thermal energy conversion.

### **Module II: Flat plate collector**

Flat plate collector (FPC) (glazing material, collector plates), classification (evacuated tubular collectors, Types of FPCs), testing of collectors,

### **Module III: Solar Concentrator**

Characteristic parameters, classification, types of concentrators (tracking concentrator, non-tracking concentrators), geometrical optics in concentrators, working principle of concentrating collectors.

### **Module IV: Applications**

Solar air heater, solar crop drying, solar cooker, solar water heating systems, heating of swimming pool by solar energy.

## **Examination Scheme:**

<b>Components</b>	<b>CT</b>	<b>Assignment</b>	<b>V</b>	<b>Attendance</b>	<b>EE(1)</b>
<b>Weightage (%)</b>	15	05	05	05	70

## **Text & References:**

- Solar Energy: Fundamentals, design, modeling and applications, Authored by G. N. Tiwari
- Renewable Energy Engineering and Technology, Edited by V.V. N. Kishore

# INTRODUCTION TO SOLAR PHOTOVOLTAIC

**Course Code:** SAE 2351

**Credit Units:** 03

## **Course Objective:**

This course covers the basic principles of Solar Photovoltaic energy systems, Grid and Off-grid connected PV systems and PV economics

## **Course Contents:**

### **Module I: Basics of Solar Photovoltaics**

Principle of photovoltaic conversion Photovoltaic generation: Introduction, silicon p-n junction, photon absorption, solar radiation input, photovoltaic circuit properties and loads

### **Module II: Review of Semiconductor Properties of Solar PV systems**

Crystal structures and orientations, forbidden energy gaps, dynamics of electrons and holes, carrier density, carrier transport, generation and recombination of carriers due to light, direct and in-direct band gap semiconductors, basic device physics, p-n junction diode, solar cell output parameters.

### **Module III: Solar Photovoltaic energy conversion and utilization**

Photovoltaic power generation systems, Off-grid systems, Grid connected systems, Organic solar cells, Electrochemical energy storage: Batteries

### **Module IV: Economic Benefits of Solar PV systems**

Solar energy benefits, environmental benefits, solar energy cost and economic impact, understanding the cost of solar energy, economics of installing solar panel

## **Examination Scheme:**

<b>Components</b>	<b>CT(2)</b>	<b>Assignme nt</b>	<b>V(1)</b>	<b>Attendan ce</b>	<b>EE(1)</b>
<b>Weightage (%)</b>	15	5	5	5	70

## **Text & References:**

1. G.N.Tiwari Solar Energy, Fundamentals design, modeling and Applications. Narosa, 2002
2. Martin A. Green, Solar Cells-Operating Principles, Technology, and System Applications M.
3. S. Tyagi, Introduction to Semiconductor Materials and Devices

# ENERGY FROM WASTES

**Course Code:** SAE 2451

**Credit Units: 03**

**Course Objective:** The objectives of this course are as follows:

- a) To provide a thorough understanding of various renewable feedstocks, their availability and attributes for biofuels production.
- b) To provide a thorough understanding of the broad concept of second and third generation biofuel production from biomass and other low-cost agri-residues and biowastes.
- c) To provide students with tools and knowledge necessary for biofuel facility operations.
- d) To teach our students to analyze and design processes for biofuel production.

## Course Content

### Module 1: Biomass

Properties of biomass, sources of biomass, photosynthesis, broad classification, agro and forestry residues utilization through conversion routes: biological, chemical and thermochemical

### Module 2: Bio conversion mechanism

Bioconversion mechanism, source of waste undergoing bio-treatment, energetic and rate processes of major biological significance

### Module 3: Thermo chemical Conversion

Thermochemical conversion of biomass, energy balance, conversion to solid, liquid and gaseous fuels

### Module 4: Chemical Conversion

Chemical conversion process, hydrolysis, pretreatments and hydrogenation, solvent, extraction of hydrocarbons

### Examination Scheme:

Components	CT	HA	S/V/Q	Attendance	EE
Weightage%	10	8	7	5	70

CT – Class Test, S/V/Q – Seminar/Viva/Quiz, HA – Home Assignment, EE – End Semester Examination

### Text & References:

1. Biomass for renewable energy, fuels and chemicals by Donald L. Klass
2. Biorenewable Resources: Engineering New Products from Agriculture. Robert C. Brown. Wiley-Blackwell Publishing (2003).
3. Renewable Energy Resources: Basic principles & applications. G.N.Tiwari and M.K.Ghosal

# RENEWABLE ENERGY FOR HEAT APPLICATIONS

Course Code: SAE 2551

Credits Units: 03

## Course Objective:

At the end of the course the students should be able to: Understand the factors that influence the use of solar radiation as an energy source; know the various active and passive technologies that are available for collecting solar energy; have the ability to apply design principles to selection of an appropriate solar energy installation to meet requirements.

## Course Contents:

### Module I: Passive Solar Heating Systems

Choosing the Type of Passive System, Advantages and Disadvantages of Passive Solar Systems, Direct Gain Systems, Thermal storage, Sizing Thermal Storage.

### Module II: Active Solar Heating Systems

Space Heating- Liquid and Air Systems, System Design Principles, Sizing of Collectors and Thermal Storage. Domestic Hot Water Heating- Thermo-siphoned and Pumped Circulation Systems, Domestic Hot Water Heating Loads,

### Module III: Green Buildings

Introduction, factors affecting climate, Climatic zones and their characteristics, Implications of climate on building design, Principles of energy conscious buildings, Building Envelope, Passive Heating, Passive Cooling, Daylighting, Building Materials

## Examination Scheme:

Components	CT(2)	Assignment	V(1)	Attendance	EE(1)
Weightage (%)	15	5	5	5	70

## Text & References:

- i) Principle of Solar Engineering” by D. Yogi Goswami, Frank Kreith and Jan F. Kreider, 2<sup>nd</sup> ed. Taylor & Francis, 2000, ISBN-10: 1-56032-714-6, ISBN -13:978-156032-714-1.
- ii) Fundamentals of Heat and Mass Transfer” by Frank P. Incropera and David P. DeWitt, John Wiley & Sons, Inc., 6<sup>th</sup> Ed., 2006
- iii) Solar Heating and Cooling” by John F. Kreider and Frank Kreith, 2<sup>nd</sup> ed., Hemisphere Publishing Corp, 1982
- iv) The Passive Solar Energy Book” by Edward Mazria, Rodale Press, 1979
- v) Solar Radiation Data Manual for Flat-Plate and Concentrating Collectors” National Renewable Energy Laboratory, 1994,
- vi) Modeling Daylight Availability and Irradiance Components from Direct and Global Irradiance” by R. Perez, P. Ineichen, R. Seals, J. Michalsky and R. Stewart, Solar Energy 44 (5) pp. 271-289
- vii) 2009 ASHRAE Handbook – Fundamentals (Inch-Pound Edition), American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (Stevens E-book on line)

# ENERGY AUDIT AND ENERGY MANAGEMENT

**Course Code:** SAE 2651

**Credit Units: 03**

## **Course Objective:**

This course covers the basic principles of energy management, energy auditing ,economics of Renewable energy systems.

## **Course Contents:**

### **Module I: Renewable Energy Economics**

Energy scenario, environmental policies, energy policies, economics of energy infrastructure, rural renewable energy economics.

### **Module II: Energy Audit**

Energy Audit concepts, Elements, Measurements, Mass and energy balances, Evaluation of energy conserving opportunities, case study.

### **Module III: Economic Benefits of Solar Energy**

Solar energy benefits, environmental benefits, solar energy cost and economic impact, understanding the cost of solar energy, economics of installing solar panel

### **Module IV: Solar Industrial Economics**

Solar power plants, integration with industrial process, integration with grid, storage of energy, economics.

## **Examination Scheme:**

<b>Components</b>	<b>CT(2)</b>	<b>Assignme nt</b>	<b>V(1)</b>	<b>Attendan ce</b>	<b>EE(1)</b>
<b>Weightage (%)</b>	15	5	5	5	70

## **Text & References:**

1. Renewable Energy: Power For A Sustainable Future, Second Ed. Edited By Godfrey Boyle
2. Solar Engineering Of Thermal Processes - J. A. Duffie, W. A. Beckman, Solar Energy Laboratory Lecture Notes

## Bachelor of Architecture

**FLEXILEARN**

-Freedom to design your degree



### Programme Structure

Curriculum & Scheme of Examination

2020

**AMITY UNIVERSITY HARYANA**

**GURUGRAM**



## Overview

B.Arch. (Bachelor of Architecture) is a 5 years long undergraduate level Degree course. This professional course is related to the field of Architecture. Architecture deals with design, planning and construction of buildings and other physical structures. Usually buildings and physical structures are said to be the product of architectural work. Sometimes, other than buildings, even construction of non-building structures becomes a part of architecture. We have comfortable homes where we live. We go to schools and colleges to study. We go for shopping to the nearest shopping mall. We go to hospital to avail treatment. These different types of buildings are creations of architects. Each type of building has its own design and distinctive style. It is the task of an architect to create such designs and bring those plans to reality. In short, architecture plays a huge role in the design and construction of humble homes and buildings to imposing dams, bridges and tunnels! An architect is a professional, who through his/her skills, is able to perform the tasks of planning, designing and constructing buildings, physical structures and non-building structures.

## Programme Objectives (PO's)

The graduates will

- PO 1**            **Architecture knowledge:** Apply the knowledge of humanities, science, architecture fundamentals to the solution of complex architectural problems.
- PO 2**            **Problem analysis:** Identify, formulate, research literature and analyze complex architectural problems reaching substantiated conclusions using principles and elements of design.
- PO 3**            **Design/ Development of Solutions:** Ability to identify social, economic, environmental and cultural issues related to architectural design process.
- PO 4**            **Conducting Investigations of complex problems:** use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
- PO 5**            **Modern tool usage:** Create, select and apply appropriate techniques, resources and modern software with an understanding of the limitations.

- PO 6**      **The architect and society:** Apply reasoning informed by the contextual knowledge to assess social, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional architectural practice.
- PO 7**      **Environment and sustainability:** Understand the impact of the professional architectural solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
- PO 8**      **Ethics:** Apply ethical and professional responsibilities of the architectural practice.
- PO 9**      **Individual and team work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
- PO 10**     **Communication:** Ability to communicate effectively on complex architectural activities with the architectural community and with society at large, such as, being able to comprehend and write reports and design documentation, make effective presentations and give and receive clear instructions.
- PO 11**     **Project management and finance:** Demonstrate knowledge and understanding of the architecture and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12**     **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

## **Programme Specific Outcomes (PSOs)**

On completion of the Bachelor of Architecture, the student will be able to:

- PSO1**      Create and evaluate architectural designs and represent designs through different manual and digital mediums.
- PSO2**      Apply technical knowledge to demonstrate a comprehensive application of life safety, accessibility and sustainability issues in making sound design decisions across varying scales and levels of complexity.

**PSO3** Relate the architectural knowledge to historical and contemporary context of theories, practices, movements, styles and environmental practices existing globally through different eras.

**PSO4** Work professionally by using leadership and communication skills or to identify specialized fields of architecture and pursue higher studies.

## Supporting document for PSOs (Programme Specific Outcomes)

PSO 1			PSO 2			PSO 3			PSO 4		
Create and evaluate architectural designs and represent designs through different manual and digital mediums.			Apply technical knowledge to demonstrate a comprehensive application of life safety, accessibility and sustainability issues in making sound design decisions across varying scales and levels of complexity			Relate the architectural knowledge to historical and contemporary context of theories, practices, movements, styles and sustainable environmental practices existing globally through different eras.			Work professionally by using leadership and communication skills or to identify specialised fields of architecture and pursue higher studies		
1	2	3	4	5	6	7	8	9	10	11	12
Architectural Design	Software Knowledge	Design Representation	Building Construction	Structural Design	Architectural Services	Theory of Architecture	Professional Practice	Environmental Issues	Courses for Higher Studies	NTC	Value added Course
Architectural Design - I	Computer Applications - I	Architectural Graphic Skills - I	Building Materials & Construction Technology - I	Structure - I	Building Services - I	History of Architecture - I	Professional Practice	Environmental Studies - I	Town Planning	Seminar	Foreign Languages
Architectural Design - II	Computer Applications - II	Architectural Graphic Skills - II	Building Materials & Construction Technology - II	Structure - II	Building Services - II	History of Architecture - II	Specification, Estimation & Valuation	Environmental Studies - II	Understanding Cultural Landscapes for Urban Renewal & Conservation	Research Methodology	Understanding for Self Effectiveness
Architectural Design - III	Computer Application & Advanced Technologies - I	Architectural Graphic Skills - III	Building Materials & Construction Technology - III	Structure - III	Building Services - III	History of Architecture - III	Site Planning & Landscape	LEED Lab - I		Dissemination	Problem Solving & Creative Thinking
Architectural Design - IV	Computer Application & Advanced Technologies - II	Visual Arts - I	Building Materials & Construction Technology - IV	Structure - IV	Building Services - IV	History of Architecture - IV	Career Development	LEED Lab - II		Thesis	Group Dynamics & Team Building
Architectural Design -	Computer Application &	Visual Arts - II	Building Materials & Construction Technology -	Structure - V		Theory of Architecture - I		People Culture & Built Environ		Practical Traini	Presentation Skills



# 13040 Bachelor of Architecture (Total Credits-279)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2101	Architectural Design-I	1	1	3	1	6
ARC2102	Building Materials & Construction Technology-I	1	-	2	2	5
ARC2104	Architectural Graphics Skills-I	1	-	1	1	3
ARC2105	Visual Arts-I	1	-	1	1	3
ARC2106	History of Architecture-I	2	-	-	-	2
ARC2109	Structure-I	2	-	-	-	2
ARC2111	Model Making	1	-	1	1	3
<b>Open Electives</b>						<b>7</b>
	Foreign Language-I	3	-	-	-	3
LAN2151	French- I					
LAN2152	German-I					
LAN2153	Spanish-I					
LAN2154	Russian-I					
LAN2155	Chinese-I					
LAN2156	Portuguese-I					
LAN2157	Korean-I					
LAN2158	Japanese-I					
LAN2159	Hindi-I **					
CSS2152	English-I*	1	-	-	-	1
BEH2151	Understanding For Self Effectiveness*	1	-	-	-	1
ENV2151	Environmental Studies-I	2	-	-	-	2
<b>TOTAL</b>						<b>31</b>

\*\* Hindi as Foreign Language for Foreign National Students

(i) 1 Lecture period/ hour shall have 1 credit

(ii) 2 lab/workshop/ studio exercises/ seminar periods/ hours shall have 1 credit and

(iii) 1 Design studio/ construction studio/ project/ thesis period/ hours shall have 1.5 credits as per the COA guidelines.

(iv) For practical training total number of credits shall be specified for the one semester.

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2201	Architectural Design-II	1	1	3	1	6
ARC2202	Building Materials & Construction Technology-II	1	-	2	2	5
ARC2204	Architectural Graphics Skills-II	1	-	1	1	3
ARC2205	Visual Arts-II	1	-	1	1	3
ARC2206	History of Architecture-II	2	-	-	-	2
ARC2209	Structure-II	2	-	-	-	2
ARC2212	Surveying & Leveling	1	-	1	1	3
<b>Open Electives</b>						<b>7</b>
LAN2251	Foreign Language-II French- II	3	-	-		3
LAN2252	German-II					
LAN2253	Spanish-II					
LAN2254	Russian-II					
LAN2255	Chinese-II					
LAN2256	Portuguese-II					
LAN2257	Korean-II					
LAN2258	Japanese-II					
LAN2259	Hindi-II					
CSS2252	English-II	1	-	-		1
BEH2251	Problem Solving & Creative Thinking	1	-	-		1
ENV2251	Environmental Studies-II	2	-	-		2
<b>TOTAL</b>						<b>31</b>

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2301	Architectural Design-III	1	1	3	1	6
ARC2302	Building Materials & Construction Technology-III	1	-	2	2	5
ARC2304	Architectural Graphics Skills-III	1	-	1	1	3
ARC2305	Visual Arts-III	1	-	1	1	3
ARC2307	History of Architecture-III	2	-	-	-	2
ARC2308	Structure-III	3	-	-	-	3
ARC2311	Architectural Climatology	2	-	-	-	2
ARC2312	Building Services-I	2	-	-	-	2
<b>Open Electives</b>						<b>4</b>
LAN2351	Foreign Language-III French-III	2	-	-		2
LAN2352	German-III					

LAN2353	Spanish-III					
LAN2354	Russian-III					
LAN2355	Chinese-III					
LAN2356	Portuguese-III					
LAN2357	Korean-III					
LAN2358	Japanese-III					
LAN2359	Hindi-III					
CSS2151	Effective Listening	1	-	-		1
BEH2351	Group Dynamics & Team Building	1	-	-		1
	<b>TOTAL</b>					<b>30</b>

#### FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2401	Architectural Design-IV	1	1	4	2	8
ARC2402	Building Materials & Construction Technology-IV	1	-	2	2	5
ARC2409	Structure-IV	3	-	-	-	3
ARC2413	Computer Applications-I	1	-	1	1	3
ARC2414	Visual Arts-IV	1	-	1	1	3
ARC2415	History of Architecture-IV	2	-	-	-	2
ARC2416	Building Services-II	2	-	-	-	2
	<b>Open Electives</b>					<b>4</b>
LAN2451	Foreign Language-IV French-IV	2	-	-		2
LAN2452	German-IV					
LAN2453	Spanish-IV					
LAN2454	Russian-IV					
LAN2455	Chinese-IV					
LAN2456	Portuguese-IV					
LAN2457	Korean-IV					
LAN2458	Japanese-IV					
LAN2459	Hindi-IV					
CSS2251	Presentation Skills	1	-	-		1
BEH2451	Stress & Coping Strategies	1	-	-		1
	<b>TOTAL</b>					<b>30</b>

#### FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2501	Architectural Design-V	1	1	4	2	8
ARC2502	Building Materials & Construction Technology-V	1	-	2	2	5



ARC2509	Structure-V	3	-	-	-	3
ARC2513	Computer Applications-II	1	-	1	1	3
ARC2517	Theory of Architecture-I	2	-	-	-	2
ARC2518	Building Services-III	2	-	-	-	2
<b>Electives (Any One)</b>						<b>3</b>
ARC2519	People Culture & Built Environment-I	3	-	-	-	3
ARC2520	Ecology, Environment & Sustainable Development-I	3	-	-	-	3
ARC2521	Computer Applications & Advance Technologies-I	3	-	-	-	3
<b>Open Electives</b>						<b>4</b>
LAN2551	Foreign Language-V French-V	2	-	-		2
LAN2552	German-V					
LAN2553	Spanish-V					
LAN2554	Russian-V					
LAN2555	Chinese-V					
LAN2556	Portuguese-V					
LAN2557	Korean-V					
LAN2558	Japanese-V					
LAN2559	Hindi-V					
CSS2351	Reading & Comprehension	1	-	-		1
BEH2552	Personality, Nationalism and Human Values	1	-	-		1
<b>TOTAL</b>						<b>30</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2601	Architectural Design-VI	1	1	4	2	8
ARC2602	Building Materials & Construction Technology-VI	1	-	2	2	5
ARC2609	Structure-VI	3	-	-	-	3
ARC2617	Site Planning & Landscape	1	-	1	1	3
ARC2618	Theory of Architecture-II	2	-	-	-	2
ARC2619	Building Services-IV	2	-	-	-	2
ARC2638	Seminar	2	-	-	-	2
<b>Electives (Any One)</b>						<b>3</b>
ARC2620	People Culture & Built Environment-II	3	-	-	-	3
ARC2621	Ecology, Environment & Sustainable Development-II	3	-	-	-	3
ARC2622	Computer Applications & Advance Technologies-II	3	-	-	-	3
<b>TOTAL</b>						<b>28</b>

## SEVENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2701	Architectural Design-VII	1	1	4	2	8
ARC2702	Building Materials & Construction Technology-VII	1	-	2	2	5
ARC2703	Structure-VII	3	-	-	-	3
ARC2705	Research Methodology	2	-	-	-	2
ARC2717	LEED Lab-I	2	-	-	-	2
ARC2718	Interior Design	1	-	1	1	3
ARC2720	Specification, Estimation & Valuation	3	-	-	-	3
<b>Electives (Any One)</b>						<b>3</b>
ARC2721	People Culture & Built Environment-III	3	-	-	-	3
ARC2722	Ecology, Environment & Sustainable Development-III	3	-	-	-	3
ARC2723	Computer Applications & Advance Technologies-III	3	-	-	-	3
<b>TOTAL</b>						<b>29</b>

## EIGHTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2801	Building Materials & Construction Technology-VIII	1	-	2	2	5
ARC2809	Architectural Design-VIII	1	1	4	2	8
ARC2815	Structure-VIII	3	-	-	-	3
ARC2816	Town Planning	2	-	-	-	2
ARC2817	LEED Lab-II	2	1	-	-	2
ARC2837	Dissertation	2	1	3	-	6
<b>Electives (Any One)</b>						<b>3</b>
ARC2818	People Culture & Built Environment-IV	3	-	-	-	3
ARC2819	Ecology, Environment & Sustainable Development-IV	3	-	-	-	3
ARC2820	Computer Applications & Advance Technologies-IV	3	-	-	-	3
<b>TOTAL</b>						<b>29</b>

## NINTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2937	Practical Training	-	-	-	-	14
	<b>TOTAL</b>					<b>14</b>

## TENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Studio (S) Hours Per Week	Practical (P)Hours Per Week	Total Credits
ARC2037	Architectural Thesis	2	6	10	-	18
ARC2001	Professional Practice	4	-	-	-	4
ARC2002	Career Development	2	-	-	-	2
	<b>Electives (Any One)</b>					<b>3</b>
ARC2003	Understanding Cultural Landscapes for Urban Renewal & Conservation	3	-	-	-	3
ARC2004	Smart Cities and Smart Technologies	3	-	-	-	3
ARC2005	Transit Oriented Development	3	-	-	-	3
	<b>TOTAL</b>					<b>27</b>

## Syllabus - First Semester

	<b>ARCHITECTURAL DESIGN – I (ARC2101)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	1	3	1	6
Pre-requisites/Exposure	NA					
Co-requisites	Visual Arts – I					

### Catalog Description

The aim of this subject is to familiarize students with visual grammar, elements of design and methods of visual composition with various mediums and color. In addition to the earlier, the intention of space design activity will be limited to the level of visual composition of architectural spaces considering human activity and anthropometry. There would be several studio/ design thinking exercises based on the module contents as is described below. The module may be taken up by the faculty in order of preference. The order should be common in both the sections of the same year. The faculty may achieve stated minimum outcome using various strategies and approaches.

*Design Exercise: Small living space, Home stay, Small showroom, Shop, Small Activity space*

### Course Objectives

The objective of this course is

- To understand the application of visual grammar in the domain of Visual design
- To create composition with various 2D and 3D media with various mediums.
- To develop the ability to translate abstract principles of design into architectural solutions for simple problems.

### Course Outcomes

On completion of this course, students will be able to

**CO1:** Define principles of design and architectural aesthetics

**CO2:** Evaluate the human activities in built environment

**CO3:** Measure drawings of simple objects

**CO4:** Evaluate and analyze 3D form with visual grammar.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Study and Application of Elements and Principles of Design in Basic Composition</b>            Elements of design in basic composition, Application of principles of design, Positive and Negative spaces, Additive and Subtractive spaces, Exercises primarily through 2-D &amp; 3-D models of simple geometric.</p>	L1, L2	10
<p><b>MODULE 2: Anthropometry</b>            Anthropometrical study of various spaces, Application of Anthropometrics, Design of Anthropometrics Cell with minimum space requirements of single unit for a single person, Study the interior spaces by making 3-D views (axonometric and isometric)</p>	L1, L2, L3	20
<p><b>MODULE 3: Measured Drawing</b>            Introduction to fundamentals of measured drawing, line value, lettering, drawing representation, format for presentation methods and technique of measuring buildings and their details.            Measured drawing of simple objects like furniture, detailing in terms of construction, ornamentation, measured drawing of building components like column, door, window, cornice, etc.</p>	L3, L4	24
<p><b>MODULE 4: Scale and Order in Architecture</b>            Analyzing single activity, anthropometrical data, designing the elements of building e.g. entrance gate design, floor design, door design, Table-Chair, Drafting table etc.            Living space, Home stay, Shop, Small Activity space, etc</p>	L4, L5, L6	18

\**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### **Text Books/ References**

- Chiara, J. D., & Callender, J. (1983). *Time-Saver Standards for Building Types. McGraw-Hill International Edition.*
- Do, E. Y. L., & Gross, M. D. (2001). *Thinking with diagrams in architectural design. Artificial Intelligence Review, 15(1–2), 135–149.* <https://doi.org/10.1023/A:1006661524497>
- Hakim, B. S., & von Meiss, P. (1994). *Elements of Architecture: From Form to Place. Journal of Architectural Education (1984-), 47(3), 182.* <https://doi.org/10.2307/1425121> Architecture: Form, Space and Order, Francis D.K. Ching
- Hencke, D. G. (1978). *Architectural graphics. Building Operating Management, 25(6), 24–26.*
- Janson, H. W., Hitchcock, H.-R., & Giedion, S. (1941). *Space, Time and Architecture; The Growth of a New Tradition. Parnassus, 13(5), 179.* <https://doi.org/10.2307/772093>
- Ormiston, R. (2009). *Understanding Architecture through Drawing by Brian Edwards. The Art Book, 16(4), 68–68.* [https://doi.org/10.1111/j.1467-8357.2009.01064\\_2.x](https://doi.org/10.1111/j.1467-8357.2009.01064_2.x)

- Quinan, J., & Alexander, C. (1981). *A Pattern Language: Towns, Buildings, Construction*. *Leonardo*, 14(1), 80. <https://doi.org/10.2307/1574526>
- Roaf, S., & McGill, G. (2018, September 3). *Place, time and architecture: the growth of new traditions*. *Architectural Science Review*, 61(5), 267–271. <https://doi.org/10.1080/00038628.2018.1502156>
- Yin, X., Wonka, P., & Razdan, A. (2009). *Generating 3D Building Models from Architectural Drawings: A Survey*. *IEEE Computer Graphics and Applications*, 29(1), 20–30. <https://doi.org/10.1109/mcg.2009.9>

### Modes of Evaluation: Assignment/ Presentation/ Literature Study/ Sheet Work

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	6	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	--	--	1	--	--	--	--	--	--	1	-	--	--
CO2	1	2	--	--	2	--	--	--	--	--	--	--	1	-	--	--
CO3	1	1	--	--	--	--	--	--	--	--	--	--	1	-	--	--
CO4	1	1	--	--	--	--	--	--	--	--	--	--	1	-	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING MATERIALS &amp; CONSTRUCTION TECHNOLOGY – I (ARC2102)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	2	2	5
Pre-requisites/Exposure	NA					
Co-requisites	Architectural Design – I					

### Catalog Description

The aim of this subject is to familiarize the students with basic concepts of building materials and construction techniques in the field. This subject will enable students to familiarize with building elements of superstructure and Sub-Structure, to apply the construction techniques involved in masonry work with different materials like brick, stone and composite materials in different locations like T- junctions, independent piers and corner junctions.

### Course Objectives

The objective of this course is

- To make students familiar with basic building elements.
- Students will understand the importance of various bonds through brick models and the assembling of these brick models in the form of courses and bonds.
- To introduce brick as building material for super and sub structure construction.
- To know and understand the basic characteristics and classification of timber as a construction material.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define basic building elements

**CO2:** Recognize the various types of masonry made up of suitable materials

**CO3:** Explain the types and necessity of timber as building material

**CO4:** Explain the principles of construction.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to Super- Structure, Sub- Structure and Building</b>	L1, L2	15

<p><b>materials</b></p> <p>Introduction to basic elements of buildings and their importance;  Brief introduction to Bricks, different types of bricks, stone, glass, R.C.C., asbestos, paints and varnishes, Fiber Reinforced Plastic (FRP),  <b>Lime:</b> Sources of lime, Classification and manufacturing process of lime, Fat and hydraulic lime – properties and use, tests on lime, etc.  <b>Cement:</b> Composition of ordinary cement, function of cement ingredients, properties of cement – soundness, setting time, strength, etc. Grade of cement and different types of cement used in construction.  <b>Mortar:</b> Sand, sources of sand and its classification, tests on sand, classification of mortar – lime mortar, mud mortar, surkhi mortar, cement mortar, preparation of mortar and its properties, use and selection of mortar for different construction work, etc.</p>		
<p><b>MODULE 2: Introduction to different types of Masonry, Brick Masonry and Stone Masonry</b></p> <p>Introduction to bonds, principle and applications, Brick walls in different bonds, ends, corners and junctions. Composition of brick earth and their properties, manufacturing process of bricks, classification of bricks, test for bricks, special type of bricks, substitutes for bricks, etc  Rubble work: Random Rubble, built-to-course and coursed masonry, miscellaneous, Classification, characteristics and properties of stones, quarrying of stone, artificial stones</p>	<p>L1, L2, L3</p>	<p>20</p>
<p><b>MODULE 3: Timber</b></p> <p>Types of timber, defects, seasoning and preservation of timber. Ecological impact due to use of wood, deforestation etc. Study of engineered wood used in buildings, i.e., Plywood, block boards, particleboards, and other types.  Application of timber in building components.</p>	<p>L1, L3,L4</p>	<p>10</p>
<p><b>MODULE 4: Principles of Construction and Building Elements</b></p> <p>Foundations, Footings, D.P.C., flooring, sills, lintel, roofing, parapets, coping, cladding expansion joints, waterproofing of roofs, external wall sections with details, beams, columns, slabs, retaining walls, etc. External Wall Section.</p>	<p>L1, L3,L4</p>	<p>15</p>

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

#### Text Books:

- Barry, R. (1999). *The Construction of Buildings Vol. 2*. 5th Ed. New Delhi: East-West Press.
- McKay, W. B. (2005). *Building Construction Metric Vol. I-IV*. 4th Ed. Mumbai: Orient Longman.
- Rangwala, S. C. (1963). *Building Construction: Materials and types of Construction*. 3rd Ed. New York: John Wiley and Sons

#### References:

- Clayton, C. R. (1987). Materials science and engineering: An introduction. *Materials Science and Engineering*, 94, 266–267. [https://doi.org/10.1016/0025-5416\(87\)90343-0](https://doi.org/10.1016/0025-5416(87)90343-0).



- Fernandes, F. M., Lourenço, P. B., & Castro, F. (2010). Ancient Clay Bricks: Manufacture and Properties. In *Materials, Technologies and Practice in Historic Heritage Structures* (pp. 29–48). Springer Netherlands. [https://doi.org/10.1007/978-90-481-2684-2\\_3](https://doi.org/10.1007/978-90-481-2684-2_3)

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	5	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	-	1	-	-	-	-	-	-	2	2	1	-	-
CO2	1	1	2	-	1	-	-	-	-	-	-	2	2	1	-	-
CO3	1	1	2	-	1	-	-	-	-	-	-	2	2	1	-	-
CO4	1	1	2	-	1	-	-	-	-	-	-	2	2	1	-	-

1: strongly related, 2: moderately related and 3: weakly related

	<b>ARCHITECTURAL GRAPHICS SKILLS-I (ARC2104)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Architectural Design- I					
Co-requisites	Basic Design & Visual Arts					

### Catalog Description

The aim of this course is to provide the students with the basic tools and techniques for free hand drawing and technical drawings. The subject covers concept of scales and lettering and familiarize them with planar and solid geometry to conceptualize the 3D forms in to 2D with the help of Orthographic Projections of Planes and Solids including sections of solids as well.

### Course Objectives

The objective of this course is

- To familiarize the students with various drawing tools and accessories used in drafting and lettering techniques to produce and visualize geometrical composition and form.
- To provide a clear understanding about the scale measurement; plane geometry, solid geometry and projections used as drawing technique.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Draw free hand drawing and lettering.

**CO2:** Project points, lines and planes in different positions in 1<sup>st</sup> angle projection system.

**CO3:** Project regular rectilinear and circular solids in different positions.

**CO4:** Apply their knowledge in making sections, intersections and interpretations of solids.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Free Hand Drawing and Lettering</b> Free hand and mechanical lettering cycle.	L1	6
<b>MODULE 2: Basic Technical Drawing</b>	L1, L2	6

Concept and types of line, Division of lines and angles, Drawing polygons, Inscribing and circumscribing circles in polygons, Drawing geometrical curves helix, Conoid etc.		
<b>MODULE 3:Orthographic Projections- Planes and Solids</b> Definition, Meaning and concept, Planes of Projections, First angle projections, Projection of points, Lines and planes in different positions. Projection of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in different positions. Sections of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc) in varying conditions of sectional plane.	L1, L2, L3	18
<b>MODULE 4: Solid Geometry</b> Construction of section, Intersection and interpenetration of solid.	L1, L2, L3	6

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books:**

- Bhatt, N.D. (53<sup>rd</sup> Edition 2014). *Engineering Drawing*: Charotar Publishing House Pvt. Ltd.
- Dhawan, R.K.(3<sup>rd</sup> Revised Edition 2006). *A textbook of Engineering Drawing (In First Angle Projection)*: S Chand & Company.
- Ramsey & Sleeper. (Sixth Edition 1970). *Architectural Graphic Standards*: John Wiley & Sons.
- Shah, P.J. (Revised Edition 2013). *Textbook of Engineering Drawing*: S Chand (G/L) & Company Ltd.

#### **References:**

- Ching, Francis D.K. (6<sup>th</sup> Edition 2015). *Architectural Graphics*: John Wiley & Sons.
- Ganesan, R., & Devarajan, V. (1998). Intersecting features extraction from 2D orthographic projections. *CAD Computer Aided Design*, 30(11), 863–873. [https://doi.org/10.1016/S0010-4485\(98\)00043-8](https://doi.org/10.1016/S0010-4485(98)00043-8)
- Williams, E. (2001). Lettering. *Eurostitch Magazine*, 9(51), 28–29. [https://doi.org/10.1007/978-94-010-2948-3\\_17](https://doi.org/10.1007/978-94-010-2948-3_17)

#### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

#### **Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	--	--	--	1	--	--	2	--	--	--	-	1	2	-	--
CO2	3	--	--	--	1	--	--	2	--	--	--	-	1	2	-	--
CO3	2	--	--	--	2	--	--	1	--	--	--	-	1	2	-	--
CO4	2	--	--	--	2	--	--	1	--	--	--	-	1	2	-	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>VISUAL ARTS-I (ARC2105)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Architectural Design- I					
Co-requisites	Carpentry & Model Making					

### Catalog Description

The aim of this course is to provide practical learning in creative thinking. The course intends to build student interest in think creative and express freedom of expression in Art, Paintings, and model making. The design and creative thinking course helps analyse complex shapes, design and application of colour.

### Course Objectives

The objective of this course is

- To understand the elements and principles of Basic Design as the building blocks of creative design through exercises that will develop the originality, expression, skill and creative thinking.
- To familiarize with principles and theories of arts and architectural composition
- To develop presentation skills, visual expression and representation, imaginative thinking and creativity through free hand sketching and painting on various mediums and materials.
- To familiarize students with the grammar of art by involving them in a series of free hand exercises both indoor and outdoor to understand form, proportion, scale, etc.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Create 2d, 3D Graphic forms, size, and their proportions

**CO2:** Create object based painting and develop creative art forms

**CO3:** Apply architectural graphics skills and improve presentation skills

**CO4:** Create life-long connection in one's pursuit for painting and other art forms

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Free Hand Sketching</b> Warm-up module for students to gain exposure to the importance of sketching and drawings in architecture. Free hand still life sketching of composition of solids, cubes, cylinders etc. Study of light, shade and shadow. Free hand sketching in pencil of elements of scale like trees, shrubs, human, figures, vehicles etc. Indoor and Outdoor Sketching.	L1, L2, L3	9
<b>MODULE 2: Live Sketching</b> Live sketching in pencil of elements of scale like trees, shrubs, human, figures, vehicles etc. Indoor and Outdoor Sketching.	L1, L2, L3	9
<b>MODULE 3: Colour Theory and Colour Wheel</b> Properties of colour – Colour schemes – Types of colours -primary, secondary and tertiary colours. Application and visual effects of colour.	L1, L2, L3, L4	9
<b>MODULE 4: Color Course</b> Introduction to Hue, Tint, Tone and Shades. Exercises for the same to study their impacts on still objects, buildings, etc	L1, L2, L3, L4	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Pen & Ink Drawing: A Simple Guide by Book by Alphonso Dunn

### Reference Books

- Ching, F. (1975). *Architectural Drafting*. In *Architectural Graphics* (pp. 15–19). Elsevier. <https://doi.org/10.1016/b978-0-85139-066-6.50005-5>
- Guptill, a L., & Meyer, S. E. (1997). *Rendering in Pen and Ink*. *Proceedings of the 23rd annual conference on Computer graphics and interactive techniques SIGGRAPH 96* (Vol. 30, pp. 469–476). Retrieved from <http://portal.acm.org/citation.cfm?doid=237170.237287>
- Pencil Points reader: a journal for the drafting room, 1920-1943. (2004). *Choice Reviews Online*, 42(02), 42-0757-42–0757. <https://doi.org/10.5860/choice.42-0757>
- The American Institute of Architects. (2010). *Architectural Graphic Standards for Residential Construction*, 2nd Edition. *American Institute of Architects*, 1–720.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	75	5	100	0	0	0	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	2	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	2	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO4	2	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-

1: strongly related, 2: moderately related and 3: weakly related

	<b>HISTORY OF ARCHITECTURE - I (ARC2106)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	NA					
Co-requisites	Visual Arts – I					

### **Catalog Description**

The aim of this course is to make students aware of different style of architecture of various regions. The architecture of the world can be categorized as per the timeline of the respective regions of the world with the rock shelters and ancient civilizations of the world with a theoretical framework and the prominent people of architecture who have significantly contributed in the establishment of major distinct architectural styles and features thereby, resulting in a holistic approach and comprehensive and exhaustive analysis of the Indian architecture. The course covers Pre-historic period, Dravidian Style, Indo-Aryan Style, etc.

### **Course Objectives:**

The objective of this course is:

- To introduce Architectural elements, forms, development trends, characteristics of construction techniques and technologies, buildings, civilization transformation over the time period.
- To familiarize socio-economic, historical, political influences of time period in Architectural development.
- To identify the buildings and the major works of the period.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate
- To gain knowledge of the development of architectural form with reference to technology, style and character in the prehistoric world and in ancient Egypt, West Asia, Greece and Islamic Period

### **Course Outcomes:**



On completion of this course, the students will be able to

**CO1:** Identify and define the world’s earliest civilizations, including the Neolithic, Paleolithic, Mesolithic and Iron Age.

**CO2:** Identify prominent historic buildings by their components of design.

**CO3:** Describe prominent historic buildings of Indo-Aryan Style

**CO4:** Analyze prominent historic buildings of Dravidian Style.

<b>.Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: History of Civilizations</b></p> <p>The type of Architectural development during the period taking few building examples of the different periods –Paleolithic, Neolithic, Mesolithic and Iron age.</p> <p><b>Indus Valley Civilization:</b> Town planning principles, cultural ethos, and economy exemplified with examples from Mohenjodaro and Harappa.</p>	L1, L2	5
<p><b>MODULE 2: Buddhist and Jain Architecture</b></p> <p>The techniques used for rock-cut spaces and free-standing built masses. The spatial and functional connotations. The Buddhist philosophy and its imprint in built space. The temple cities of Palitana, Mount Abu and Girnar. The Jain philosophy and its imprint in built form. The Jain mandalas.</p>	L1, L2	5
<p><b>MODULE 3: Hindu Architecture- Indo-Aryan</b></p> <p>The evolution of the temple form, evolution of the shikhara in north India. The three schools of architecture - the Gujarat, the Khajuraho, and the Orrisan styles. Comparison in spatial attributes, scale and detail.</p>	L1, L2	6
<p><b>MODULE 4: Hindu Architecture-Dravidian</b></p> <p>The evolution of the vimana and the contributions of the Chalukyas, the Pallavas, the Pandyas and the Cholas. The contributions of the Nayaks to the temple cities. The city morphology, spatial diversity and planning criteria. Hindu philosophy and its imprint in temples/traditional houses and other built structures. Mandala and the geometric grid in temple plans. The proportional theory in temple elevation.</p>	L1, L2	8

*\*Bloom’s Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books:**

- Fergusson, J. (2013). *History of Indian and Eastern Architecture. History of Indian and Eastern Architecture*. Cambridge University Press. <https://doi.org/10.1017/cbo9781139814638>

**References:**

- Architect, J., Prize, P., Yamasaki, M., Khan, L., & Tange, K. (1987). *History of architecture 1*, 4–6.

- Eaton, L. K. (1988). A History of Architecture: Settings and Rituals Spiro Kostof. *Journal of the Society of Architectural Historians*, 47(1), 75–76. <https://doi.org/10.2307/990258>
- Hancock, J. E., & Kostof, S. (1986). A History of Architecture: Settings and Rituals. *Journal of Architectural Education (1984-)*, 39(3), 31. <https://doi.org/10.2307/1424785>
- Hartoonian, G., & Hartoonian, G. (2018). On history. In *Time, History and Architecture* (pp. 14–29). Routledge. <https://doi.org/10.4324/9781315270210-2>
- McMahon, A. P., & Fletcher, B. (1938). A History of Architecture on the Comparative Method. *Parnassus*, 10(5), 31. <https://doi.org/10.2307/771691>
- Roth, L. M., & Roth Clark, A. C. (2018). *Understanding architecture: Its elements, history, and meaning. Understanding Architecture: Its Elements, History, and Meaning* (pp. 1–745). Taylor and Francis. <https://doi.org/10.4324/9780429495588>

### Modes of Evaluation: Quiz/ Assignment/ Seminar/ Presentation/ Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	-	2	--	--	--	--	--	--	--	--	-	--	--	1	--
CO2	1	-	3	--	--	--	--	--	--	--	--	-	--	--	1	--
CO3	1	-	2	--	--	--	--	--	--	--	--	-	--	--	1	--
CO4	1	-	2	--	--	--	--	--	--	--	--	-	---	--	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>STRUCTURE - I (ARC2109)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure						
Co-requisites	Building Materials & Construction Technology – I					

### Catalog Description

The aim of this course is to enable students to understand various principles of strength of materials. The course covers Engineering mechanics, stress and strain of beams, shear force and bending moment theory. The subject will be taught in congruence with the Design studio, and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same.

### Course Objectives

The objective of this course is

- To introduce the structural system in a building with all the basic components.
- To understand the functions of various elements and building technologies used in various types of buildings.
- To study of stresses and strains and their effect in various elements.
- To give an introduction to the basic principles governing structural systems.
- To introduce basic prefabricated and high-rise structure.

### Course Outcomes

On completion of this course, the students will be able to

- CO1:** Explain basics of engineering mechanics  
**CO2:** Define stresses and strains with their effects in various elements  
**CO3:** Explain force and bending moment diagrams.  
**CO4:** Understand prefabricated and high-rise building structure.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Engineering mechanics</b> Introduction , force, resultant force, parallelogram ,triangle, and polygon law of forces, system of forces, Lami's theorem, moment of forces, parallel forces , couple , center of gravity , moment of inertia, friction , angle of friction, angle of repose, basics of pulley centripetal and centrifugal force, super elevation ,work,	L1, L2	06

power, energy. Frame- perfect and imperfect frame, motion of a lift, lifting machine		
<b>MODULE 2: Stress and strain</b> Introduction, direct stress and strain , shear stress and strain, stress strain diagram for mild steel, young's modulus , poisson's ratio, shear modulus, bending equation for beam in simple bending volumetric strain, bulk modulus, stress in bass of varying section, shear stress diagram, stresses in composite bass, flinched beams, stresses due to change in temperature, principal of superposition, principal stress and strain , Mohr's circle of stresses , resilience.	L1, L2	06
<b>MODULE 3: Shear Force and bending moment diagram, theory of yielding and failure</b> Types Of Beams, Supports, Loadings, Assumption Of Theory Of Bending ,SFD And BMD, Material Failure, Structural Failure, Max Principal Stress (Rankine's theory), Max Principle Stress (Saint-Venant's principle), Maximum Shear Stress , Total Strain Energy Theory , Shear And Distortion Strain (von Mises and Hencky)	L1, L2	06
<b>MODULE 4: Design principles and elementary concept for building construction systems</b> Design principles of RCC beams and slabs. Construction system: reinforced concrete, pre-stressed concrete and prefab system and modular co-ordination. Load action and high-rise buildings, various structural systems for high rise buildings.	L1, L2	06

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### Text Books

- Arya, C. (2009). Eurocode 3: Design of steel structures. In Design of Structural Elements (pp. 375–433). CRC Press. <https://doi.org/10.1201/b18121-13>
- Emmitt, S., & Gorse, C. (2014). Barry's Advanced Construction Of Buildings Third edition. John Wiley & Sons, Ltd (Vol. 28, p. 581).
- Salvadori, M., & Heller, R. (1986). Structure In Architecture: The Building Of Buildings, Third Edition. Struct in Archit, The Build of Build, Third Ed. Prentice-Hall Inc.

### References

- Oppermann, R. H. (1941). Strength of materials, part I, elementary theory and problems. Journal of the Franklin Institute, 231(1), 96. [https://doi.org/10.1016/s00160032\(41\)90378-](https://doi.org/10.1016/s00160032(41)90378-)
- Von Glasersfeld, E. (2009). A model for the construction of elementary concepts (pp. 45– 50). AIP Publishing. <https://doi.org/10.1063/1.58258>

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	2	-	-	1	-	-	-	1	-	-	-	2	2	1	-	-
<b>CO2</b>	2	-	-	1	-	-	-	1	-	-	-	2	2	1	-	-
<b>CO3</b>	2	-	-	1	-	-	-	1	-	-	-	2	2	1	-	-
<b>CO4</b>	2	-	-	1	-	-	-	1	-	-	-	2	2	1	-	-

1: strongly related, 2: moderately related and 3: weakly related

	<b>MODEL MAKING (ARC2111)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Basic Drawing and Sketching					
Co-requisites	Basic Design & Visual Arts					

### Catalog Description

The aim of this course is to provide the foundation, knowledge and skills needed to work in Carpentry & Model Making. The course covers modelling aspects with the focus on understanding the scale and proportions. The modelling making can be taught using various materials in a workshop-based activity. The students would produce/create several 3D, Architectural Designs and experimental innovative aspects to create unique visual presentation of specializing in the subject.

### Course Objectives

The objective of this course is

- To teach the modeling aspects with the focus on understanding the scale and proportions.
- To guide students in modeling making can be taught using various materials in a workshop-based activity.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Sketching and developing 2D, 3D Graphical forms in scales, size, and their proportions

**CO2:** Create object based models and develop creative art forms

**CO3:** Applying architectural graphics skills in model making presentations

**CO4:** Create life-long connection in one's pursuit for model making and other art forms

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction</b> Introduction to the art of model making and its allied tools, techniques and	L1, L2, L3	9

materials.		
<b>MODULE 2: Design Evolution</b> Conceptual sketching/ planning, design and developing various three-dimensional geometries in the model making; in context of understanding the scale and proportion.	L1, L2, L3	9
<b>MODULE 3: Workshop</b> The workshop based activity will help in understanding the qualities of different materials, different types of joints and model making to relevant scales and proportions. Students may use different materials such as – Paper, Thermocol, Clay, Wood, Plaster of Paris, metals, and use of different colors in model making.	L1, L2, L3, L4	9
<b>MODULE 4: Presentation</b> Teaching and developing the presentation skills of the models, using various techniques and materials. The students may also incorporate the same for their Architectural Design studio problem	L1, L2, L3, L4	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Congdon, R.T. (First Edition 2010). *Architectural Model Building: Tools, Techniques and Materials*: Fairchild Books

### Reference Books

- Janke, Rolf. (First Edition 1968). *Architectural Models*: Frederick A. Praeger.
- Taylor, J.R. (1971). *Model Building for Architects and Engineers*: McGraw-Hill Inc.
- Werner, Megan. (First Edition 2011). *Model Making*: Princeton Architectural Press.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

#### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ				Total
I	II									
10	10	75	5	100	0	0	0	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	--	--	--	1	--	--	--	2	--	--	--	1	3	2	--
CO2	1	--	--	--	2	--	--	--	1	--	--	--	1	3	2	--
CO3	1	--	--	--	2	--	--	--	1	--	--	--	1	3	2	--
CO4	3	--	--	--	1	--	--	--	1	--	--	--	1	3	2	--

1: strongly related, 2: moderately related and 3: weakly related



## Syllabus – Second Semester

	<b>ARCHITECTURAL DESIGN – II (ARC2201)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	1	3	1	6
Pre-requisites/Exposure	Architectural Design – I					
Co-requisites	Building Materials & Construction Technology - I					

### Catalog Description

The aim of this subject is to familiarize the students with architectural design process through small scale projects of human habitat. The design activity will be limited to the level of visual composition of architectural spaces considering human activity and anthropometry, building material exploration, colour etc. The projects would connect horizontal circulation reflecting their creative approach drawn from data analysis and climatic consideration to the physical setting.

*Examples of project: Clinic, Residence, Bank, Canteen, Studio Apartment, etc.*

### Course Objectives

The objective of this course is

- To involve students in a design project(s) that will involve simple space planning and the understanding of the functional aspects of good design.
- To involve students in a small scale building project(s) which will sensitize them to intelligent planning that is responsive to the environmental context.
- To involve students in building case study by choosing appropriate examples to enable them to formulate and concretize their concepts
- To enable the presentation of concepts through various modes and techniques that will move constantly between 2D representation and 3D modeling

## Course Outcomes

On completion of this course, the students will be able to

**CO1:** Understand the application of the architectural design process for small scale projects of human habitat.

**CO2:** Transform the human behavioral needs into architectural program requirements.

**CO3:** Analyze the information on context and the human space relationship.

**CO4:** Compose the architectural spaces in a design project.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Design Process and Human as user of space</b> Study and differentiate human needs, wants and desire, study of cases for different user's requirements, Transform the behavioural requirements into space form, Study of relationship among spaces with proximity chart, Storytelling etc.	L1, L2,	10
<b>MODULE2: Human Activity and Context</b> Study if a context and its surroundings and collect information, Analyse the above information in favour of the usage perspective, Understanding of human scale to the context.	L!, L2	10
<b>MODULE 3: Planning of Spaces</b> Distribution of the human activity spaces along the context considering the context as visual background, Analyse the relationship among the spaces. Verbal presentation on planning of built environment with different mediums.	L4, L5, L6	20
<b>MODULE 4: Detail Design of Interior Spaces with a theme</b> Detail planning and design of interior spaces considering human needs and human anthropometric data with a theme. Application of building materials with colour and texture in detail design. Verbal presentation of Interior Spaces.	L4, L5, L6	20

\**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

## Text Books/References:

- Béjar, R., Latre, M. Á., Nogueras-Iso, J., Muro-Medrano, P. R., & Zarazaga-Soria, F. J. (2009). *An architectural style for spatial data infrastructures*. International Journal of Geographical Information Science, 23(3), 271–294. <https://doi.org/10.1080/13658810801905282>
- Chiara, J. D., & Callender, J. (1983). *Time-Saver Standards for Building Types* Fourth Edition. McGraw-Hill International Edition.
- Givoni, B. (2004). *Time Saver Standards for Urban Design: Urban Design and Climate*. Digital Engineering Library @ McGraw-Hill.
- Head, A. J. (2017). *Planning and Designing Academic Library Learning Spaces: Expert Perspectives of Architects, Librarians, and Library Consultants*. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.2885471>

- USACE. (1997). *Human Behavior and the Interior Environment*. In Design Guide for Interiors.
- Wolfenden, A., & Chusid, M. (1991). *Time-Saver Standards for Building Types*: (3rd Edition). Journal of Testing and Evaluation, 19(4), 347. <https://doi.org/10.1520/jte12583j>

### Modes of Evaluation: Literature Study/ Case Study/ Presentation/ Written Examination

#### Examination Scheme

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	5	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	2	--	--	--	--	--	--	-	1	2	--	--
CO2	1	1	1	1	2	--	--	--	--	--	--	-	1	2	--	--
CO3	1	1	2	2	1	-	-	-	-	-	-	-	-	1	-	3
CO4	3	-	2	1	1	-	-	-	-	-	--	-	-	1	-	-

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING MATERIALS &amp; CONSTRUCTION TECHNOLOGY – II (ARC2202)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	2	2	5
Pre-requisites/Exposure	Building Materials & Construction Technology – I					
Co-requisites	Architectural Design – II					

### **Catalog Description**

The aim of this course is to make students familiar with basic concepts of building materials and construction techniques in the field. The study in the semester increases in complexity from shallow and spread foundations to deep foundations. Study of openings will proceed to the study of Arches and its classification, to familiarize the students with the temporary supporting structures required for construction.

### **Course Objectives**

The objective of this course is

- To introduce students to details of shallow and deep foundations.
- To understand openings and the use and construction details of doors and windows with timber shutters and frames.
- To understand the use of construction building materials like clay and timber.
- Students will also learn about arches.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** To develop understanding about foundations and the constructions techniques involved.

**CO2:** To recognize the various types of temporary supporting structures used in different locations in the building industry

**CO3:** To understand the importance of wooden carpentry joinery details used in openings

**CO4:** To evaluate the best suitable Joinery in openings and become aware of conventional and new clay products used.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Foundations: Shallow, spread &amp; Deep</b></p> <p>Shallow foundation: Types, Isolated, combined and raft foundations and their construction techniques. Deep Foundation: Grillage foundations, Piles foundations, Caisson foundations, etc.</p>	L1, L2, L3	15
<p><b>MODULE 2: Temporary Supporting Structures</b></p> <p>Form work and shuttering for different types of RCC elements, trench timbering, scaffolding, shoring and underpinning.</p>	L1, L2	10
<p><b>MODULE 3: Timber Doors and Windows</b></p> <p>Timber: Structure and timber trees, varieties of timber, defects in timber, decay of timber, Qualities of timber for construction, seasoning, storage and preservation of timber, properties and strength of manufactured products, veneers, plywood, block boards, fiber board, etc.</p> <ul style="list-style-type: none"> <li>• Doors: classification of doors; (a) paneled doors. (b) ledged and battened doors, (c) ledged, braced and battened doors, (d) framed, ledged, braced, and battened doors (e) flush doors</li> <li>• Windows: Timber windows; Casement window and its details</li> </ul>	L1, L3, L4	20
<p><b>MODULE 4: Arches and Clay Product</b></p> <p>Classification of Arches on the basis of geometrical shape, materials, construction techniques, viz. flat, segmental, semi-circular, Tudor, circular, elliptical, semi-elliptical, venetian, Florentine arches, etc. Illustration of terminology for arches, construction detailing and methods of centring.</p> <p>Clay Products: Flooring and roofing tiles, their properties, manufacturing process, laying of tiles, etc.. Clay products like terra-cotta, earthenware, stoneware, porcelain, mud – its stabilization and uses, etc.</p>	L1, L3, L4	15

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

#### **Text Books:**

- Barry, R. (1999). *The Construction of Buildings Vol. 2*. 5th Ed. New Delhi: East-West Press.
- Chudley, R. (2008). *Building Construction Handbook*. 7th Ed. London: Butterworth-Heinemann.
- McKay, W. B. (2005). *Building Construction Metric Vol. I-IV*. 4th Ed. Mumbai: Orient Longman.

- Rangwala, S. C. (1963). *Building Construction: Materials and types of Construction*. 3rd Ed. New York: John Wiley and Sons

**References:**

- Clayton, C. R. (1987). Materials science and engineering: An introduction. *Materials Science and Engineering*, 94, 266–267. [https://doi.org/10.1016/0025-5416\(87\)90343-0](https://doi.org/10.1016/0025-5416(87)90343-0).
- Fernandes, F. M., Lourenço, P. B., & Castro, F. (2010). Ancient Clay Bricks: Manufacture and Properties. In *Materials, Technologies and Practice in Historic Heritage Structures* (pp. 29–48). Springer Netherlands. [https://doi.org/10.1007/978-90-481-2684-2\\_3](https://doi.org/10.1007/978-90-481-2684-2_3)
- Freidin, K., & Erell, E. (1995). Bricks made of coal fly-ash and slag, cured in the open air. *Cement and Concrete Composites*, 17(4), 289–300. [https://doi.org/10.1016/0958-9465\(95\)00017-7](https://doi.org/10.1016/0958-9465(95)00017-7)
- Saikia, N., & De Brito, J. (2012, September). Use of plastic waste as aggregate in cement mortar and concrete preparation: A review. *Construction and Building Materials*. <https://doi.org/10.1016/j.conbuildmat.2012.02.066>

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	5	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO2	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO3	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO4																

1: strongly related, 2: moderately related and 3: weakly related

	<b>ARCHITECTURAL GRAPHICS SKILLS-II (ARC2204)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Architectural Graphics Skills-I					
Co-requisites	Architectural Design-II, Basic Design and Visual Arts-II					

### **Catalog Description**

The aim of this course is to provide the theoretical, practical and pictorial aspect of the architectural drawings to the students. The subject covers concepts of metric drawings and development surfaces familiarize them with isometric and axonometric views and development of the surfaces of basic forms. The subject will be taught in congruence with the design studio, and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same.

### **Course Objectives**

The objective of this course is:

- To familiarize the students with theoretical, practical and pictorial aspects of architectural drawings.
- To develop the perception and presentation of simple architectural forms and buildings.
- To introduce the development of the basic forms in architecture.
- To equip the students with visualization and surface development of complex forms.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Recognize the need to combine the use of manual drawing tools and techniques for drafting and freehand drawing for architectural design communication.

**CO2:** Produce 3- Dimensional Architectural drawings and forms by using drawings/sketching and manual techniques.

**CO3:** Produce surface development of the simple geometric forms.

**CO4:** Produce and visualize the surface development of the complex architectural forms.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to Metric Drawing</b> Types, uses and advantages, Isometric, Axonometric and Pictorial views, Metric Drawing and projection and their Dimensioning, Metric of plane figures composed of straight lines, Metric of circles, Metric of simple and complex block.	L1, L2, L3	06
<b>MODULE 2: Isometric and Axonometric Drawings</b> Preparation of Isometric and Axonometric views of the 3d composition of simple geometric forms, architectural manifestation and exploded Isometric of furniture and architectural plans.	L2, L3, L4	12
<b>MODULE 3: Development of Surfaces of simple form</b> Development of surfaces of cubes, prisms, cylinders, pyramids, cones and spheres.	L1, L2, L3	12
<b>MODULE 4: Development of Surfaces of complex composition of form</b> Development of surfaces of composition of cubes, prisms, cylinders, pyramids, cones and spheres.	L3, L4, L5	6

\**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Bhatt, N.D. (53<sup>rd</sup> Edition 2014). *Engineering Drawing*: Charotar Publishing House Pvt. Ltd.
- Dhawan, R.K.(3<sup>rd</sup> Revised Edition 2006). *A textbook of Engineering Drawing (In First Angle Projection)*: S Chand & Company.
- Ramsey & Sleeper. (Sixth Edition 1970). *Architectural Graphic Standards*: John Wiley & Sons.
- Shah, P.J. (Revised Edition 2013). *Textbook of Engineering Drawing*: S Chand (G/L) & Company Ltd.

### References

- Ching, Francis D.K. (6<sup>th</sup> Edition 2015). *Architectural Graphics*: John Wiley & Sons.
- Ganesan, R., & Devarajan, V. (1998). Intersecting features extraction from 2D orthographic projections. *CAD Computer Aided Design*, 30(11), 863–873. [https://doi.org/10.1016/S0010-4485\(98\)00043-8](https://doi.org/10.1016/S0010-4485(98)00043-8)
- Williams, E. (2001). Lettering. *Eurostitch Magazine*, 9(51), 28–29. [https://doi.org/10.1007/978-94-010-2948-3\\_17](https://doi.org/10.1007/978-94-010-2948-3_17)



**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	--	2	--	1	--	--	3	3	--	--	-	1	2	--	--
CO2	3	--	2	--	1	--	--	3	3	--	--	-	1	2	--	--
CO3	2	--	2	--	1	--	--	3	3	--	--	--	1	2	--	--
CO4	2	--	2	--	1	--	--	3	3	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>VISUAL ARTS – II (ARC2205)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Visual Arts – I					
Co-requisites	Architectural Design - II					

### **Catalog Description**

The aim of this course is to provide practical learning in creative thinking. The course intends to build student interest in think creative and express freedom of expression in Art, Paintings, and model making. The design and creative thinking course helps analyze complex shapes, design and application of colour.

### **Course Objectives**

The objective of this course is to

- To introduce Art and appreciation its philosophies.
- To develop sensitivity towards sculpture and mural as an integral part of architecture.
- To familiarize with principles and theories of arts and architectural composition.
- To utilize the skills for rendering and paintings.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Create 2d, 3D Graphic forms, size, and their proportions

**CO2:** Create art forms with different mediums

**CO3:** Apply rendering techniques for indoor and outdoor painting.

**CO4:** Create life-long connection in one's pursuit for painting and other art forms

Modules	Blooms level*	Number of hours
<b>MODULE 1: Art and Philosophy</b> An introduction to the basic formal concepts in the two-dimensional arts and the principles of aesthetic organization. Using Shapes to construct aesthetically pleasing compositions	L1, L2, L3	9
<b>MODULE 2: 2D Compositions</b> An introduction to the basic formal concepts in the two-dimensional arts and the principles of aesthetic organization. Using Shapes to construct aesthetically pleasing composition	L1, L2, L3	9
<b>MODULE 3: Rendering</b> Rendering techniques, dot rendering, point rendering of still and live objects	L1, L2, L3, L4	9
<b>MODULE 4: Painting</b> Different types of painting styles and their masters and philosophy, Indoor and outdoor painting – Exercise involving Water colour – Water soluble colour pencil – Tempura – Acarali – Water soluble oil colour – Oil colour – Pen and ink – Brush – Air brush – Mixed mediums – Study of multi-colour and 3D effects from nature and built environment	L1, L2, L3, L4	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Pen & Ink Drawing: A Simple Guide by Book by Alphonso Dunn

### Reference Books

- Ching, F. (1975). *Architectural Drafting*. In *Architectural Graphics* (pp. 15–19). Elsevier. <https://doi.org/10.1016/b978-0-85139-066-6.50005-5>
- Guptill, a L., & Meyer, S. E. (1997). *Rendering in Pen and Ink. Proceedings of the 23rd annual conference on Computer graphics and interactive techniques SIGGRAPH 96* (Vol. 30, pp. 469–476). Retrieved from <http://portal.acm.org/citation.cfm?doid=237170.237287>
- Pencil Points reader: a journal for the drafting room, 1920-1943. (2004). *Choice Reviews Online*, 42(02), 42-0757-42–0757. <https://doi.org/10.5860/choice.42-0757>
- The American Institute of Architects. (2010). *Architectural Graphic Standards for Residential Construction*, 2nd Edition. *American Institute of Architects*, 1–720.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

### Examination Scheme:

Evaluation Scheme		Total Marks	Credits	Duration of Exam (hr)
Internal Assessment	External Assessment			

CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	75	5	100	0	0	0	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
CO2	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
CO3	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
CO4	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>HISTORY OF ARCHITECTURE - II (ARC2206)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	History Of Architecture – I					
Co-requisites	Visual Arts – II					

### **Catalog Description**

The aim of this course is to make students familiar with the characteristics of the history of World and Indian Architecture, Urbanism, and the built environment from pre-history to the present; this course explores buildings and cities in their cultural, social, political, and religious contexts. This course will introduce the development of Indian architecture styles, provinces of India to cities and citadels to Mughal architecture and Islamic cities and monuments. The understanding of space development and structural quality based design approach would enable students to design smaller basic structures / houses with applicable structural principles and construction techniques in mind. Innovation in the use of conventional material in non-conventional way, as portrayed in the landmark historic buildings, would also help students to think out of the box.

### **Course Objectives**

The objective of this course is:

- To introduce architectural elements, forms, development trends, characteristics of construction techniques and technologies, buildings, civilization transformation over the time period.
- To familiarize the students with the socio-economic, historical, political influences of time period in Architectural development and identify the buildings and the major works of the period.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate
- To familiarize the students with the development of architectural form with reference to technology, style and character in Islamic Architecture, Provincial Architecture, Mughal Architecture, Islamic cities & Monuments.

## Course Outcomes

On completion of this course, the students will be able to

**CO1:** Analyze the contributing factors for the design development of the Islamic Architecture.

**CO2:** Identify and analyze the development of Sultanate Period.

**CO3:** Critically analyze the development of colonial styles in various provinces of India.

**CO4:** Identify and analyze the features of Mughal Period.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to Islamic Period</b> Introduction and understanding of ‘Islam’s’ philosophy and its consequent rituals and their interpretation in building type e.g. mosque, tomb, fort and their elements like domes, minarets, arch, squinch, landscape, motif, calligraphy, directionality, symmetry, geometry, material, court, water, patterns etc. <b>Islamic cities &amp; Monuments:</b> Concepts of city Planning of various Islamic towns example- Shahajahanabad, Fatehpur Sikri etc. Monuments – Qutab Complex, Tughlakabad, Taj Mahal, Gol Gumbaj, Golconda Fort, Jami Masjid etc.	L1,L2	3
<b>MODULE 2: The Sultanate Style</b> With reference to the Slave, Khalji, Tughlaq, Lodi and ShershahSuri (who ruled from Delhi), architecture at Punjab, Gujrat, Bijapur and deccan.	L1,L2	3
<b>MODULE 3: Provincial Architecture</b> Development of colonial styles in various provinces of India like Punjab, Jaunpur, Gujrat, Bengal, Bijapur, Bidar and Deccan.	L1,L2	3
<b>MODULE 4: Mughal Architecture</b> The architecture of the Timuris in India-Babur, Hamayun, Akbar, Jahangir and Shahjahan, which was the culmination of the Indo-Islamic paradigm. The proportions, structure systems, landscape, materials, scale and distinct features.	L1,L2	3

\**Bloom’s Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

## Text Books

- Gosta,E.Samdstrp.(1962) *Man the Builder*, Mc.Graw Hill Book Company, New York.
- Hoag, J. D. (2002). *Islamic architecture. History of world architecture* (pp. 203 p., 24 p. of plates).
- Pier Luigi Nervi.(1972). *History of World Architecture - Series*, Harry N.Abrams, Inc.Pub., New York, 1972.
- Sir Banister Fletcher.(1996).*A History of Architecture*, University of London, The Antholone Press.

- S.Lloyd and H.W.Muller.(1986).*History of World Architecture - Series, Faber and Faber Ltd.*, London,.
- Webb and Schaeffer; *Western Civilisation Volume I*; VNR: NY:

### References

- Hancock, J. E., & Kostof, S. (1986). *A History of Architecture: Settings and Rituals*. Journal of Architectural Education (1984-), 39(3), 31. <https://doi.org/10.2307/1424785>
- Roth, L. M., & Roth Clark, A. C. (2018). *Understanding architecture: Its elements, history, and meaning. Understanding Architecture: Its Elements, History, and Meaning* (pp. 1–745). Taylor and Francis. <https://doi.org/10.4324/9780429495588>
- Spiro Kostof.(1985). *A History of Architecture: Setting and Rituals*, Oxford University Press, London.
- Vincent Scully: *Architecture; Architecture – The Natural and the Man Made*: Harper Collins Pub: 1991

### Modes of Evaluation: Literature Study/ Case Study/ Presentation/ Written Examination

#### Examination Scheme

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	--	--	--	--	--	--	--	--	--	--	--	--	1	2
CO2	1	2	--	--	--	--	--	--	--	--	--	--	--	--	1	2
CO3	1	2	--	--	--	--	--	--	--	--	--	--	--	--	1	2
CO4	1	2	--	--	--	--	--	--	--	--	--	--	--	--	1	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>STRUCTURE – II (ARC2209)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Structure – I					
Co-requisites	Building Materials & Construction Technology – II					

### Catalog Description

The aim of this course is to enable students to understand various principles of strength of materials especially in case of beams, columns and trusses. The course covers deflection of beams, forces in members of truss, condition of equilibrium and displacement methods. The subject will be taught in congruence with the Design studio, and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same.

### Course Objectives

The objective of this course is

- To understand the basic principles of structural system so that it forms the basis for study of structural design.
- To help students to understand the basic principles of structural behavior and requirements of buildings with emphasis laid on the principles of various load distribution in beams and columns.
- To understand the basic principles of structural mechanics that would be pertinent to simple design elements and understanding the structural behavior of buildings.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Calculate deflection of beams through analytical method.

**CO2:** Analyze the resolution of forces as well as various study of various theorem related to equilibrium.



**CO3:** Explain force and bending moment diagrams.

**CO4:** Calculate deflection in beams and trusses through graphic and conjugate method.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Deflection of Beams</b> Equation for deflection of beams, formula for maximum deflection under various loading conditions, shear stress in shaft, stiffness of a spring- leaf and helical spring. Column and struts – effective length, buckling load, short or long column, slenderness ratio, Rankine's formula, Euler's formula, dams and retaining walls, Rankine's theory for active earth pressure	L1, L2	09
<b>MODULE 2: Forces in Members Of Trusses</b> Types of Trusses, Method of Section, Method of Joint, Analytical Method, Graphical Method, Analysis of Plane Trusses and Space Trusses	L1, L2	09
<b>MODULE 3: Statically Determinate and In-determinate Structures</b> Condition of equilibrium, compatibility conditions, simple and compound systems, linear and nonlinear systems, sway and sinking, analysis of statically determinate formulas.	L1, L2	09
<b>MODULE 4: Displacements – Geometric Methods</b> Deflected shapes, moment area method, conjugate beam method, deflection of trusses – graphical method.	L1, L2	09

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### **Text Books**

- Arya, C. (2009). Eurocode 3: Design of steel structures. In Design of Structural Elements (pp. 375–433). CRC Press. <https://doi.org/10.1201/b18121-13>
- Emmitt, S., & Gorse, C. (2014). Barry's Advanced Construction Of Buildings Third edition. John Wiley & Sons, Ltd (Vol. 28, p. 581).
- Salvadori, M., & Heller, R. (1986). Structure In Architecture: The Building Of Buildings, Third Edition. Struct in Archit, The Build of Build, Third Ed. Prentice-Hall Inc.

### **References**

- Oppermann, R. H. (1941). Strength of materials, part I, elementary theory and problems. Journal of the Franklin Institute, 231(1), 96. [https://doi.org/10.1016/s00160032\(41\)90378-](https://doi.org/10.1016/s00160032(41)90378-)
- Von Glasersfeld, E. (2009). A model for the construction of elementary concepts (pp. 45– 50). AIP Publishing. <https://doi.org/10.1063/1.58258>

### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
CO2	--	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
CO3	--	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
CO4	--	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SURVEYING AND LEVELLING (ARC2212)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Structure – II					
Co-requisites	Structure – III					

### **Catalog Description**

The aim of this subject is to make students understand the ground situation before preparing an architectural design of any type of structure. The survey maps will be foundation documents for selection of technique of design based on ground elevation and contour pattern of proposed site. This subject covers the conceptual theory and practical application of surveying and leveling on ground with help of various survey concepts, techniques, methods and instruments. The subject will be taught is congruence with the Design studio, and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same.

### **Course Objectives**

The objective of this course is

- To understand the role of surveying and leveling in architecture
- To introduce the techniques and equipment for land surveying.
- To understand the practical surveying in the field.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Enable the students to understand land topography and its connection with surveying & leveling exercises.

**CO2:** Enable the students to understand the primary basic surveying techniques adopted in past years.

**CO3:** Enable the students to understand essentials parameters (basic and advanced) of leveling with various instruments & methods and concept of contouring.

**CO4:** Enable to do contour and slope analysis for a building.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Introduction to surveying</b> Introduction to surveying, its practicality in the profession. Classification of various survey instruments, techniques &amp; equipment. Reading of survey maps, understanding of features and undulations of ground. Scaling of survey measurements and errors in surveying. Concept of trigonometry, traversing &amp; tachometry in surveying.</p>	L1, L2	04
<p><b>MODULE 1: Measurements</b> Measurements in horizontal plane, linear measurements with chain &amp; tape, setting-out &amp; survey stations, survey accessories, survey lines, open &amp; closed traverse, chaining &amp; offsetting, direct &amp; indirect ranging, log-books, field boundaries, field area estimation. Chain Surveying: Principles of survey, equipment required selection of station, methods of taking offsets. Compass Surveying: The prismatic compass, its construction and uses and other types of compasses.</p>	L1, L2	09
<p><b>MODULE 3: Basic and advanced surveying techniques</b> Plane table surveying (equipment, methods, advantage &amp; disadvantage, errors etc.), Theodolite Surveying (temporary &amp; permanent adjustment, measuring of magnetic bearings, horizontal &amp; vertical angles and Theodolite traverse &amp; balancing closing error). Tachometric surveying (general instruments, different systems of tachometric measurements, stadia method). The concept of total station survey and its multi-functioning in surveying. Introduction to Use of DGPS, automated &amp; digital surveying, G.P.S, Aerial Photography, etc.</p>	L1, L2	14
<p><b>MODULE 4: Contours and Slope Analysis</b> Contouring methods &amp; equipment, contour intervals, direct &amp; indirect methods of contouring, block contour surveys, profile levelling, longitudinal &amp; traverse cross sections, and gradients. Measurements along sloping landforms, principles, definitions, methods, instruments required for simple &amp; differential levelling.</p>	L1, L2	09

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation

### **Text Books & References**

- Clancy, J. (2013). Site Surveying and Leveling. Site Surveying and Leveling. Routledge. <https://doi.org/10.4324/9780080928487>.
- Ježko, J. (2014). Calibration of Surveying Instruments and Tools – Means to the Quality Increase of Deformation Measurements. Journal of Sustainable Mining, 13(4), 17–22. <https://doi.org/10.7424/jsm140404>
- Zhang, L., Mao, Q., Li, Q., & Zhang, P. (2014). An accuracy-improvement method for GPS/INS kinematic leveling for use in linear engineering surveying projects. Measurement: Journal of the

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	0	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	2	--	3	--	--	--	2	1	--	2	--	2	1	3	--
CO2	--	2	--	3	--	--	--	2	1	--	2	--	2	1	3	--
CO3	--	2	--	3	--	--	--	2	1	--	2	--	2	1	3	--
CO4	--	2	--	3	--	--	--	2	1	--	2	--	2	1	3	--

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus – Third Semester

	<b>ARCHITECTURAL DESIGN – III (ARC2301)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	1	3	1	6
Pre-requisites/Exposure	Architectural Design –II					
Co-requisites	Architectural Climatology					

### Catalog Description

The aim of this course is to involve formulation of design concepts and developing simple single storied load bearing structure. The semester focuses on the understanding of context and elements of built form in an existing setting. The projects would connect horizontal circulation reflecting their creative approach drawn from data analysis and climatic consideration to the physical setting. The subject will be integrated with Visual Arts, History of Architecture, Structure, Climatology, Water Supply and Sanitation.

***Design Exercise: Primary School, Restaurant, Nursing Home, Primary Health Centre, etc.***

### Course Objectives

The objective of this course is

- To develop sensitivity towards existing informal settings and elements of built space.
- To critique the materials, construction techniques and structural system used in the elements of built forms.
- To create an understanding of the inter relationships amongst various elements of architecture – form, function, space planning, user perception and behavior and culture.
- To understand the relationship between form and spaces and the importance of aesthetics.
- To enable the presentation of concepts through sketches and models and drawings.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Collect data from standards, case studies for the current project.

**CO2:** Analyze data collected with relevance to the current project.

**CO3:** Integrate learning from other allied subjects to the design proposal.

**CO4:** Complete the architectural project with all given requirements for the given project.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction to the Design Problem</b> Introduction to the design problem. Case studies. Collecting relevant data for the given design problem. Synthesising and analysing the collected data.	L4.L5,L6	16
<b>MODULE 2: Site study and Area Programming</b> Site visit and Site analysis. Driving area requirements for the design exercise.	L4.L5,L6	16
<b>MODULE 3: Design Development</b> Relation to various functional aspects of the design problem. Use of bubble diagram, flow diagrams, zoning of site, etc. conceptual design. Finalization of design proposals – schematic 2D/3D single line/conceptual level site plan, floor plan, elevations, sections.	L4.L5,L6	20
<b>MODULE 4: Final design Proposals</b> Final developed to the scale drawings of Site Plan, Floor Plans, Elevations, Sections, Views. Detailed site plan with built and un-built spaces and landscaping features. Model of the proposed design	L4.L5,L6	20

\**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books/References:**

- Béjar, R., Latre, M. Á., Nogueras-Iso, J., Muro-Medrano, P. R., & Zarazaga-Soria, F. J. (2009). An architectural style for spatial data infrastructures. *International Journal of Geographical Information Science*, 23(3), 271–294. <https://doi.org/10.1080/13658810801905282>
- Chiara, J. D., & Callender, J. (1983). *Time-Saver Standards for Building Types*. McGraw-Hill International Edition.
- Givoni, B. (2004). *Time Saver Standards for Urban Design: Urban Design and Climate*. Digital Engineering Library @ McGraw-Hill, 1–14.
- Head, A. J. (2017). Planning and Designing Academic Library Learning Spaces: Expert Perspectives of Architects, Librarians, and Library Consultants. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2885471>

- Julius, P., & Zelnik, M. (1979). Human Dimension & Interior Space. *Vasa*. Retrieved from <http://medcontent.metapress.com/index/A65RM03P4874243N.pdf>
- Wolfenden, A., & Chusid, M. (1991). Time-Saver Standards for Building Types: 3rd Edition. *Journal of Testing and Evaluation*, 19(4), 347. <https://doi.org/10.1520/jte12583j>
- Head, A. J. (2017). Planning and Designing Academic Library Learning Spaces: Expert Perspectives of Architects, Librarians, and Library Consultants. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2885471>

## Modes of Evaluation: Literature Study/ Case Study/ Presentation/ Written Examination

### Examination Scheme

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	00	50	50	100	6	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	2	--	--	--	--	--	--	-	1	2	--	--
CO2	1	1	1	1	2	--	--	--	--	--	--	-	1	2	--	--
CO3	2	1	2	2	1	-	-	-	-	-	-	-	1	2	-	-
CO4	2	1	1	1	2	-	-	-	-	-	-	-	1	2	-	-

1: strongly related, 2: moderately related and 3: weakly related



	<b>BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY - III (ARC2302)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	2	2	5
Pre-requisites/Exposure	Building Materials & Construction Technology – II					
Co-requisites	Architectural Design – III					

### **Catalog Description**

The aim of this subject is to introduce students with the classification, types and details of construction of roofs. And to give complete knowledge about the various types of flooring and its construction details. To familiarize students with different types of vertical circulation possibilities. Types and construction details of all vertical circulation elements will be dealt with in detail. Students will also learn about water proofing methods and techniques at all building levels.

### **Course Objectives**

The objective of this course is

- To understand timber single and double roofs and timber floors.
- To comprehend the various modes of vertical circulation through live examples.
- To learn properties of various construction materials like waterproofing materials, clay used as flooring materials and timber used in the building industry.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** To understand timber single and double roofs.

**CO2:** To understand timber floor and partition

**CO3:** Make students aware of various types of staircases with reference to its placement, geometry and material used.

**CO4:** To understand importance, stages, methods and techniques of waterproofing,

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Timber: Roofs</b></p> <p>Classification of roofs: (a) Single roofs; flat roofs, lean-to roofs, double lean-to, couple, close couple and collar roofs (b) Double or Purlin Roofs. (c) Trussed rafter roofs (d) Triple or framed roofs (e) Common roof coverings with its laying</p> <p>Waterproofing, rainwater gutter details.</p> <p>King post and Queen post roof trusses</p>	L1, L2	15
<p><b>MODULE 2: Timber- Floor &amp; Partitions</b></p> <p>Timber floors: construction techniques, types of timber floors: single, double and triple joist timber floors,</p> <p>Furnishing of floors with different floor finishes like cement, coloured cement, mosaic, terrazzo, tiles etc. special consideration for rubber and PVC flooring, methods of laying</p> <p>Types of timber partitions: Single, double and flushed timber partitions</p>	L1, L2, L3	20
<p><b>MODULE 3: Introduction to Vertical transportation and Staircases</b></p> <p>Description of staircases, technical terminology involved, classification of staircases based on shape, material and its construction details.</p> <ul style="list-style-type: none"> <li>• Vertical section through staircases with detailing at various levels of staircases-Dog legged, Circular, Open Well, Spiral, Elliptical, etc.</li> </ul> <p>Classification also based on materials like wooden, steel and RCC</p> <ul style="list-style-type: none"> <li>• Staircase layout and its construction details, different elements of staircases, etc.</li> <li>• Design and details of construction of staircases in timber, stone, RCC and steel.</li> <li>• Cladding materials using traditional and contemporary materials</li> </ul>	L1, L3, L4	10
<p><b>MODULE 4: Water Proofing Materials</b></p> <ul style="list-style-type: none"> <li>• Waterproofing details in different levels: details in simple foundations, walls, roofs, sills, lintels and roofs in RCC, RB and steel, damp proof details of plinth, sill, lintel, and roof level.</li> <li>• Water proofing materials and systems for basement</li> </ul>	L1, L3, L4	15

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Barry, R. (1999). *The Construction of Buildings Vol. 2*. 5th Ed. New Delhi: East-West Press.
- McKay, W. B. (2005). *Building Construction Metric Vol. I-IV*. 4th Ed. Mumbai: Orient Longman.
- Rangwala, S. C. (1963). *Building Construction: Materials and types of Construction*. 3rd Ed. New York: John Wiley and Sons

### References

- Clayton, C. R. (1987). Materials science and engineering: An introduction. *Materials Science and Engineering*, 94, 266–267. [https://doi.org/10.1016/0025-5416\(87\)90343-0](https://doi.org/10.1016/0025-5416(87)90343-0).
- Fernandes, F. M., Lourenço, P. B., & Castro, F. (2010). Ancient Clay Bricks: Manufacture and Properties. In *Materials, Technologies and Practice in Historic Heritage Structures* (pp. 29–48). Springer Netherlands. [https://doi.org/10.1007/978-90-481-2684-2\\_3](https://doi.org/10.1007/978-90-481-2684-2_3)

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	5	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO2	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO3	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO4	1	1	1	-	2	-	-	-	-	-	-	2	2	1	-	-

1: strongly related, 2: moderately related and 3: weakly related

	<b>ARCHITECTURAL GRAPHICS SKILLS-III (ARC2304)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Architectural Graphic Skills – II					
Co-requisites	Architectural Design – III					

### **Catalog Description**

The aim of this course is to develop essential manual skills such as proficiency in drawing, largely used as primary mode of communication of ideas in architectural design. Students will be introduced to a variety of tools and techniques for visual expression with emphasis on manual drawing. Architectural Graphics-II introduces advanced techniques for architectural drawing such as perspective projection, mix-media renderings etc. The course would help students identify suitable methods of representation and methods in different built environment scenarios.

### **Course Objectives**

The objective of this course is

- To familiarize the students with One Point Perspective visualization of architectural drawing.
- To familiarize the students with Two Point Perspective visualization of architectural drawing.
- To introduce a variety of tools and techniques for visual expression with emphasis on manual drawing.
- To introduce the geometrical method of producing shadows in Architectural Drawings.

### **Course Outcomes**

On completion of this course, the students will be able to

- CO1:** Recognize the need to combine the use of manual drawing tools and techniques for drafting architectural design communication.
- CO2:** Apply the projected drawing method of exterior and interior perspective
- CO3:** Render the drawings in different mediums.
- CO4:** Draw views demonstrating the play of light and shadows.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: One Point Perspective Drawing</b> One perspectives of combination of geometrical forms, Building exterior and interior perspectives.	L3, L4	12
<b>MODULE 2: Two Point Perspective Drawing</b> Two perspectives of combination of geometrical forms, Building exterior and interior perspectives. Introduction to three-point perspective and basic exercises based on the same	L3, L4	12
<b>MODULE 3: Rendering</b> Rendering perspectives in different media (Dry and water based color and ink etc.). Presentation techniques in different types of rendering and materials. Variation in color/ ink, as per light position. Use of basic plantation, vehicles etc to introduce scale to building perspectives.	L4,L5	6
<b>MODULE 4: Sciography</b> Values in shades and shadows, constructing plan shadows (point, line and plane), Constructing shadows in elevations (Point, line and Plane). Short- cut methods for constructing shadows. Introduction of sciography in perspective drawings.	L4,L5	6

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books:**

- N D Bhatt,(2014).*Engineering Drawing,(Plane and solid geometry)*,Delhi, Charotar Publishing house.

#### **References**

- Francis D.K. Ching (1979),*Architecture: Form, Space and Order*, John Wiley& Sons Publication
- Heller Robert and Salvadori Mario (1975),*Structure in Architecture*, Englewood Cliffs, N.J.Prentice-Hall
- Parmar V.S.(1973), *Design Fundamental in Architecture*, Somaiya Publications

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	3	--	--	--	2	--	--	--	--	--	1	2	--	--
CO2	1	--	2	--	--	--	--	--	--	--	--	--	1	2	3	--
CO3	1	--	2	--	--	--	--	--	--	--	--	--	1	2	3	--
CO4	1	--	3	--	--	--	--	--	--	--	--	--	1	2	3	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>VISUAL ARTS – III (ARC2305)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Visual Arts – II					
`	Architectural Design - III					

### Catalog Description

The aim of this course is to provide practical learning in creative thinking. The course intends to build student interest in think creative and express freedom of expression in Art, Paintings, and model making. The design and creative thinking course helps analyse complex shapes, design and application of colour.

### Course Objectives

The objective of this course is

- To introduce the concept of perspectives and perspective drawings.
- To develop architectural skills of perspectives
- To familiarize with principles and theories of arts and its appreciation techniques.
- To introduce the concept of shades and shadows in architecture drawing.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Appreciate art and art works and re-create them in form of logos, symbols, etc.

**CO2:** Create perspectives for surroundings and buildings

**CO3:** Understand the importance of shading devices in architecture

**CO4:** Understand the role of shades and shadows in building construction

Modules	Blooms level*	Number of hours
<b>MODULE 1: Art Appreciation</b> Graphic representations – Visual composition and Abstraction- Exercises involving Logo design, collage, calligraphy and printing.	L1, L2, L3	9
<b>MODULE 2: Perspective (Free-Hand)</b> Free-hand perspective drawing and rendering of imagined objects, in pencil and pen/ink. One and two point perspective drawings of solids and of different room	L1, L2, L3	9

interiors.		
<b>MODULE 3: Perspective (Free-Hand)</b> Free-hand perspective drawing of complex composition of solids. One and two point perspective view of the exterior of the building with understanding of the basic human proportion and scale. Introduction to three point perspective.	L1, L2, L3, L4	9
<b>MODULE 4: Sciography</b> Values in shades and shadows, Constructing plan shadows (point, line and plane), Constructing shadows in elevations (Point, line and Plane). Short- cut methods for constructing shadows Presentation techniques in different types of rendering techniques and materials.	L1, L2, L3, L4	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Pen & Ink Drawing: A Simple Guide by Book by Alphonso Dunn

### Reference Books

- Ching, F. (1975). *Architectural Drafting*. In *Architectural Graphics* (pp. 15–19). Elsevier. <https://doi.org/10.1016/b978-0-85139-066-6.50005-5>
- Guptill, a L., & Meyer, S. E. (1997). *Rendering in Pen and Ink. Proceedings of the 23rd annual conference on Computer graphics and interactive techniques SIGGRAPH 96* (Vol. 30, pp. 469–476). Retrieved from <http://portal.acm.org/citation.cfm?doid=237170.237287>
- Pencil Points reader: a journal for the drafting room, 1920-1943. (2004). *Choice Reviews Online*, 42(02), 42-0757-42–0757. <https://doi.org/10.5860/choice.42-0757>
- The American Institute of Architects. (2010). *Architectural Graphic Standards for Residential Construction*, 2nd Edition. *American Institute of Architects*, 1–720.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

#### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ				Total
I	II									
10	10	75	5	100	0	0	0	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping



	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>
<b>CO1</b>	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
<b>CO2</b>	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
<b>CO3</b>	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
<b>CO4</b>	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>HISTORY OF ARCHITECTURE – III (ARC2307)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	History of Architecture – II					
Co-requisites	Architectural Design – III					

### Catalog Description

The aim of this course is to make students aware of different style of architecture of various regions. The architecture of the world can be categorized as per the timeline of the respective regions of the world with the ancient civilizations of the world with a theoretical framework and the prominent people of architecture who have significantly contributed in the establishment of major distinct architectural styles and features thereby, resulting in a holistic approach and comprehensive and exhaustive analysis of the world architecture.

### Course Objectives

The objective of this course is

- To identify different styles of historic architecture.
- To familiarize with the socio-economic, historical, political influences of time period in Architectural development.
- To identify prominent / important historic buildings by their components / style of design

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Describe prominent / important historic buildings

**CO2:** Analyze the contributing factors for the design development of different styles

**CO3:** Identify and describe the characteristics of the Roman Kingdom, Roman Empire, and Imperial Rome.

**CO4:** Design buildings in the historic architectural styles.

Modules	Blooms level*	Number of hours
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<p><b>MODULE 1: Introduction to Mesopotamian and Egyptian Architecture</b>  Introduction to Mesopotamian civilizations, their social systems and cultures</p> <ul style="list-style-type: none"> <li>• Salient building types – Mesopotamian: <ul style="list-style-type: none"> <li>• Ziggurats and their development – White Temple, Ziggurat of Ur, Urnammu and Khorsabad</li> <li>• Generic Temple Layout - Temple Oval and Khafaje</li> <li>• Palace Complex/Citadel of Khorsabad, Nebuchadnezzar’s Babylon, Persepolis</li> </ul> </li> <li>• Introduction to Egyptian civilization, their social systems and cultures • Salient building types – Egyptian: <ul style="list-style-type: none"> <li>• Temples &amp; temple complexes - Cult Temple and Mortuary Temple</li> <li>• Mastaba – development and typical components</li> <li>• Pyramids – Complex of Zoser, Pyramid of Cheops and Cephren, Standard mortuary complex layout of pyramids</li> </ul> </li> </ul>	L1, L2	6
<p><b>MODULE 2: Greek Architecture</b>  • Introduction to Greek civilization, their social systems and cultures  • Classical Order – Doric, Ionic, Corinthian  • Salient building types:</p> <ul style="list-style-type: none"> <li>• Temple types on basis of column layout – case example of Acropolis, Athens</li> <li>• Discussion of Hellenic Temple (Parthenon, Athens) versus Hellenistic Temple (Athena Polias, Priene)</li> <li>• Public Buildings and Square – Agora, Stoa, Prytaneum, Bouleuterion, Tholos, Gymnasium, Theatre</li> </ul>	L1, L2	6
<p><b>MODULE 3: Roman Architecture</b>  • Introduction to Roman civilization, their social systems and cultures  • Contribution in new materials and new construction/structural systems, eg, Pozzolana, Cementae, Stone Blocks, Stone Masonry, Arch, Vault, Dome  • Salient buildings:</p> <ul style="list-style-type: none"> <li>• Forums of Rome,</li> <li>• Pantheon</li> <li>• Aqueduct</li> <li>• Colosseum</li> <li>• Bath of Caracalla</li> <li>• Basilica of Trajan</li> </ul>	L1, L2	6
<p><b>MODULE 4: Early Christian &amp; Romanesque Architecture</b>  • Introduction to society and culture of 400 -1150 AD in Europe  • Early Christian Architecture</p> <ul style="list-style-type: none"> <li>• Development of Early Christian Church from Roman Basilica</li> <li>• Salient building – St. Peter’s Basilica</li> </ul>	L1, L2	6

<ul style="list-style-type: none"> <li>•Romanesque Architecture <ul style="list-style-type: none"> <li>• Development of Romanesque architecture from Early Christian architecture</li> </ul> </li> </ul>		
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*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Sir Banister Fletcher, A History of Architecture, University of London, The AntholonePress, 1996.
- Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford UniversityPress, London, 1985.
- Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
- Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams,Inc.Pub., New York, 1972

### Reference Books

- S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd.,London, 1986.
- Gosta,E.Samdstp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
- Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
- Vincent Scully: Architecture; Architecture – The Natural and the Man Made: Harper Collins Pub: 1991.
- Christian Norberg-Schulz, Meaning in Western Architecture, Praegur, 1975
- Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, Ltd. 2007

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total	100	2	3
I	II									
10	10	25	5	50	50	0	50			

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO4	1	1	--	--	--	--	--	--	--	--	--	--	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>STRUCTURE - III (ARC2308)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Structure – II					
Co-requisites	Building Materials & Construction Technology – III					

### Catalog Description

The aim of this course is to understand the ground situation before preparing an architectural design of any type of structure. In this course basic principles of structural mechanics that would be pertinent to simple design elements and understanding the structural behavior of buildings. The survey maps will be foundation documents for selection of technique of design based on ground elevation and contour pattern of proposed site. This subject covers the conceptual theory and practical application of surveying and leveling on ground with help of various survey concepts, techniques, methods and instruments.

### Course Objectives

The objective of this course is

- To understand an informal choice regarding the most appropriate structural system for the building design due to different types of loading.
- To provide a basic understanding about the structural modeling and research techniques in the field of Architecture.
- To understand the role of surveying and leveling in architecture and will be introduced to the techniques and equipment's for land surveying.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the calculation of concentrated loads

**CO2:** Define the basis of arches and cables

**CO3:** Analyze Frame – With Lateral Translation and With No Lateral Translation of Joints by Slope deflection method and Moment deflection method

**CO4:** Explain frames with and without lateral translation of joints

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Loads and spans</b> Introduction, single concentrated load, udl longer than the span, UDL shorter than the span, two concentrated spans, series of concentrated loads, equivalent UDL	L1, L2	06
<b>MODULE 2: Arches and Cables</b> Basis of arches, cables and suspension in bridges, basic concept, frames with and without lateral translations of joints, general case – 1 story column slender in height and bases fixed or hinged.	L1, L2	08
<b>MODULE 3: Slope deflection method and Moment distribution Method</b> Slope Deflection Method and Moment Distribution Method, Development of Slope Deflection, Equation, Analysis Of Frame – With Lateral Translation And With No Lateral Translation Of Joints. MDM- Development of Method, Analysis Of Frames With Lateral Translation And With No Lateral Translation Of Joints, Symmetrical Frames, Multi Storey Frames, No Shear Moment Distribution	L1, L2	14
<b>MODULE 4: Kani's Method</b> Basic concept, frames with and without lateral translation of joints, general cases, story column unequal in height and bases fixed or hinged	L1, L2	08

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### **Text Books**

- Arya, C. (2009). Eurocode 3: Design of steel structures. In Design of Structural Elements (pp. 375–433). CRC Press. <https://doi.org/10.1201/b18121-13>
- Emmitt, S., & Gorse, C. (2014). Barry's Advanced Construction Of Buildings Third edition. John Wiley & Sons, Ltd (Vol. 28, p. 581).
- Salvadori, M., & Heller, R. (1986). Structure In Architecture: The Building Of Buildings, Third Edition. Struct in Archit, The Build of Build, Third Ed. Prentice-Hall Inc.
- Oppermann, R. H. (1941). Strength of materials, part I, elementary theory and problems. Journal of the Franklin Institute, 231(1), 96. [https://doi.org/10.1016/s00160032\(41\)90378-](https://doi.org/10.1016/s00160032(41)90378-)
- Von Glasersfeld, E. (2009). A model for the construction of elementary concepts (pp. 45– 50). AIP Publishing. <https://doi.org/10.1063/1.58258>

### **References**

- Guo, Y., Du, Q., Luo, Y., Zhang, W., & Xu, L. (2008). Application of augmented reality GIS in architecture. In The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences (Vol. XXXVII, pp. 331–336). ISPRS.

- Kilford, W. K. (1979). SURVEYING FOR ENGINEERS. Survey Review, 25(192), 94–96.  
<https://doi.org/10.1179/sre.1979.25.192.94>

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	00	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	--	--	1	2	--	--	1	--	--	--	3	2	1	--	--
CO2	--	--	--	1	2	--	--	1	--	--	--	3	2	1	--	--
CO3	--	--	--	1	2	--	--	1	--	--	--	3	2	1	--	--
CO4	--	--	--	1	2	--	--	1	--	--	--	3	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>ARCHITECTURAL CLIMATOLOGY (ARC2311)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Architectural Design -II					
Co-requisites	Architectural Design – III					

### **Catalog Description**

The aim of this course is to obtain knowledge required for understanding the influence of climate on architecture. This course helps to acquaint students to various concepts of climate and its use in architecture and makes them understand the concept of human thermal comfort as an essential function of the buildings in accordance with climate responsive architecture, ventilation and air movement. The students are exposed to the various design strategies for building in different types of climatic zones. The subject will be taught in congruence with the Design studio, and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same.

### **Course Objectives**

The objective of this course is

- To acquaint the students to various concepts of climate analysis and its use in Architecture.
- To familiarize students with human thermal comfort as an essential function of building.
- To familiarize students with the design and settings for buildings for daylight and factors that influence temperature.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Analyze factors affecting climate and its elements.

**CO2:** Analyze different climatic zones and their characteristics and design shelters in response to various climate zones. And analyze relation between transfer of heat between buildings and environment and design buildings for thermal comfort.

**CO3:** Analyze movement of sun in relation to earth and design shading devices. And analyze how to avoid sun's heat but utilize maximum daylight.

**CO4:** Analyze the effect of water bodies, vegetation and topography on micro urban climate. And Determine orientation of the building with respect to sun and wind for passive cooling and heating techniques for energy efficient, green and sustainable architecture.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Introduction to climate</b> Importance of climate in architecture, factors affecting climate, elements of climate- Solar radiation, temperature, wind, humidity and precipitation and their measurement.</p>	L1, L2	3
<p><b>MODULE 2: Climatic zones and human thermal comfort</b> Climatic zones, macro and micro climate, elements of climate and climatology data required for design of buildings in different climatic zones, Characteristics of tropical climate, macroclimate and microclimate. Study of various shelters in response to various climate zones in the tropical belt of India. Study of body's heat production and heat loss, comfort zone, bio-climatic chart and effective temperature, Isopleths.</p>	L1, L2, L3, L4	6
<p><b>MODULE 3: Solar chart, shading devices and Daylight</b> Method of recording the position of sun in relation to earth, solar chart, azimuth, altitude, incidence, using shadow angle protractor for designing shading devices. Apparent movement of sun, solar radiation and intensity on surfaces and buildings in different latitude, sun path diagram, shading device and its design, heliodon and its use; Opaque building and heat transfer through its multi-layered envelope; Transparent surface and solar radiation on it, absorbance, reflectance, transmittance and remittance. Fenestration, lighting level and glare, amount of light, sky as a source of light and daylight factor, effect of different types of fenestrations, their size, shape in different planes with and without obstructions, Principles of day lighting in Tropics.</p>	L1, L2, L3, L4	8
<p><b>MODULE 4: Site climate and passive design strategies</b> Microclimate, site climate data, local factors, presence of water body and vegetation, topography, special characteristics, urban climate cooling degree days and heating degree days. Orientation-sitting of building with respect to sun, wind and view, use of evaporative cooling, ground cooling-earth air tunnel, thermal mass-cavity wall, natural ventilation of attic space, night time cooling, reflective surfaces and radiant barrier, cool roof and green roof, solar radiation and sun space. Introduction to ECOTECT and Design Builder software.</p>	L1, L2, L3, L4	7

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

**Text Books**

- Koenigsberger, O. H. (1975). *Manual of Tropical Housing and Building Climatic Design*: University Press.
- Krishan, Arvind. (1st Edition 2017). *Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings*: Tata McGraw-Hill Education.

**Reference Books**

- Altan, H., Hajibandeh, M., Tabet Aoul, K. A., & Deep, A. (2016). Passive design. In *Springer Tracts in Civil Engineering* (pp. 209–236). Springer. [https://doi.org/10.1007/978-3-319-31967-4\\_8](https://doi.org/10.1007/978-3-319-31967-4_8)
- 2. Mohamed, S. (2002, September). Safety climate in construction site environments. *Journal of Construction Engineering and Management*. [https://doi.org/10.1061/\(ASCE\)07339364\(2002\)128:5\(375\)](https://doi.org/10.1061/(ASCE)07339364(2002)128:5(375))
- 3. Rind, D. (2002, April 26). Climatology: The Sun’s role in climate variations. *Science*. <https://doi.org/10.1126/science.1069562>
- 4. Rupp, R. F., Vásquez, N. G., & Lamberts, R. (2015, August 17). A review of human thermal comfort in the built environment. *Energy and Buildings*. Elsevier Ltd. <https://doi.org/10.1016/j.enbuild.2015.07.047>
- 5. Taleghani, M., Tenpierik, M., Kurvers, S., & Van Den Dobbelen, A. (2013). A review into thermal comfort in buildings. *Renewable and Sustainable Energy Reviews*. <https://doi.org/10.1016/j.rser.2013.05.050>

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

## CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	3	--	--	--	--	1	--	--	--	--	--	2	3	1	--
CO2	--	3	--	--	--	--	2	--	--	--	--	--	2	--	1	--
CO3	--	--	2	--	--	--	1	--	--	--	--	--	2	3	1	--
CO4	--	--	2	--	--	--	1	--	--	--	--	--	2	3	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING SERVICES – I (ARC2312)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Building Materials And Construction Technology –II					
Co-requisites	Architectural Design – III					

### **Catalog Description**

The aim of this subject is to give architects an overview and introduction to Plumbing systems and architectural considerations and their co-ordination with other services and architectural designs. Architectural services are the systems installed in buildings to make them comfortable, functional, efficient and safe. The course covers Water Supply and Sanitation system design in the buildings

### **Course Objectives**

The objective of this course is

- To understand the need and importance of building services.
- To understand the water supply system at urban level.
- To understand the importance of sanitation and sewerage system.
- To understand the treatment process of waste water.

### **Course Outcomes**

On completion of this course, the students will be able to

- CO1:** Apply knowledge gained on water supply system in small buildings.  
**CO2:** Design sewage system for a residential building.  
**CO3:** Design drainage system at urban level.  
**CO4:** Prepare and understand principles of waste water management.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Water Supply</b> Need to protect water supply, Requirements of water supply to different types of buildings. Sources of water supply, Quantity and quality of water as per NBC. Conveyance and distribution of water, Overhead tank, Underground tanks, Pipe appurtenances. Hot and cold water supply system in a low rise and high rise buildings. Distribution system in campus, Pipes their size, Jointing and different fittings.	L1, L2	6
<b>MODULE 2: Sanitary Engineering</b> Purpose and principles of sanitation, Collection and conveyance of waste matter. Quantity and Quality of refuse, Design and construction of sewer's and sewer appurtenances. Garbage and sewage disposal. Sanitary appliances, Traps their variety, Pipes and joints, Sanitary pipes works below and above ground level.	L1, L2	6
<b>MODULE 3: Road and Drainage systems</b> Introduce to the basic concepts of municipal drainage system, road pattern at city level. Roof and surface water drainage. Rain water storage and water harvesting principles and methods.	L4, L5, L6	6
<b>MODULE 4: Waste Management System</b> Introduction of different type of wastes produced at Urban level. Its management skills and criteria's for collections, Disposal and treatment of wastes. Reduce–Reuse–Recycle, Waste collection, Treatment & disposal. Thermal treatment Dumps and Landfills. Biological waste treatment. Waste water treatment	L4, L5, L6	6

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- Walter T. Gondzik (2000) Mechanical And Electrical Equipment For Building
- Punmia, B.C. (2005). Building Construction, New Delhi: Laxmi Publishers
- Rangawala, (2017). Water supply and sanitary engineering, Gujrat: Charotar publisher
- National Building codes of India.

### **Reference Books**

- Anon. (1984). Water Supply. Civil Engineering New York, N.Y., 54(7), 40–41. <https://doi.org/10.31729/jnma.916>
- Hoekstra, A. (2010). The water footprint : water in the supply chain. Water, (93), 12–13.
- WHO, & Unicef. (2000). Global Water Supply and Sanitation Assessment 2000 Report. Water\_Supply,87.
- [https://doi.org/http://www.who.int/water\\_sanitation\\_health/monitoring/globalassess/en/](https://doi.org/http://www.who.int/water_sanitation_health/monitoring/globalassess/en/)

### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

#### **Examination Scheme:**

Evaluation Scheme								Total marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	--	1	--	--	--	--	--	--	--	--	2	2	1	--	--
CO2	2	--	1	--	--	--	--	--	--	--	--	2	2	1	--	--
CO3	2	--	1	--	--	--	--	--	--	--	--	2	2	1	--	--
CO4	2	--	1	--	--	--	--	--	--	--	--	2	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Fourth Semester

	<b>ARCHITECTURAL DESIGN – IV (ARC2401)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	1	4	2	8
Pre-requisites/Exposure	Architectural Design – III					
Co-requisites	Building Materials & Construction Technology, Architectural Graphic Skills-IV					

### **Catalog Description**

The aim of this course is to make students familiar with the characteristics of site and the importance of site planning which includes built form and open space and context. This course will introduce methods of site analysis and research, new generative drawing techniques as well as architectural and disciplinary conventions associated with site work. The course is important as it will familiarize the students with architecture, landscape architecture, planning, structural and electrical engineering and the related issues that contribute to the built environment for our society. The projects would connect horizontal circulation reflecting their creative approach drawn from data analysis and climatic consideration to the physical setting.

***Design Exercise: Informal Market area, Haat, Showrooms, Museums, Library, etc.***

### **Course Objectives**

The objectives of this course are:



- To develop sensitivity towards existing informal settings and elements of built space.
- To critique the materials, construction techniques and structural system used in the elements of built forms.
- To create an understanding of the inter relationships amongst various elements of architecture – form, function, aesthetics, space planning, user perception and behavior and culture.
- To enable the presentation of concepts through sketches and models and drawings.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Collect data from standards, case studies for the current project.

**CO2:** Analyze data collected with relevance to the current project.

**CO3:** Integrate learning from other allied subjects to the design proposal.

**CO4:** Complete the architectural project with all given requirements for the given project.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to the Design Problem</b> Introduction to the design problem. Case studies. Collecting relevant data for the given design problem. Synthesising and analysing the collected data.</p>	L4.L5,L6	20

<b>MODULE 2: Site study and Area Programming</b> Site visit and Site analysis. Driving area requirements for the design exercise.	L4.L5,L6	20
<b>MODULE 3: Design Development</b> Relation to various functional aspects of the design problem. Use of bubble diagram, flow diagrams, zoning of site, etc. conceptual design. Finalization of design proposals – schematic 2D/3D single line/conceptual level site plan, floor plan, elevations, sections.	L4.L5,L6	28
<b>MODULE 4: Final design Proposals</b> Final developed to the scale drawings of Site Plan, Floor Plans, Elevations, Sections, Views. Detailed site plan with built and un-built spaces and landscaping features. Model of the proposed design	L4.L5,L6	28

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books/References:**

- Béjar, R., Latre, M. Á., Nogueras-Iso, J., Muro-Medrano, P. R., & Zarazaga-Soria, F. J. (2009). An architectural style for spatial data infrastructures. *International Journal of Geographical Information Science*, 23(3), 271–294. <https://doi.org/10.1080/13658810801905282>
- Chiara, J. D., & Callender, J. (1983). *Time-Saver Standards for Building Types. McGraw-Hill International Edition.*
- Givoni, B. (2004). *Time Saver Standards for Urban Design: Urban Design and Climate. Digital Engineering Library @ McGraw-Hill*, 1–14.
- Head, A. J. (2017). Planning and Designing Academic Library Learning Spaces: Expert Perspectives of Architects, Librarians, and Library Consultants. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2885471>
- Julius, P., & Zelnik, M. (1979). *Human Dimension & Interior Space. Vasa*. Retrieved from <http://medcontent.metapress.com/index/A65RM03P4874243N.pdf>
- Wolfenden, A., & Chusid, M. (1991). *Time-Saver Standards for Building Types: 3rd Edition. Journal of Testing and Evaluation*, 19(4), 347. <https://doi.org/10.1520/jte12583j>

#### **Modes of Evaluation: Literature Study/ Case Study/ Presentation/ Written Examination**

#### **Examination Scheme**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	8	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	2	3	--	--	3	--	--	-	1	2	--	--
CO2	1	1	1	1	2	3	--	--	3	--	--	-	1	2	--	--
CO3	1	1	1	1	1	2	-	-	2	-	-	-	1	2	-	-
CO4	1	1	1	1	2	3	-	-	2	-	-	-	1	2	-	-

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING MATERIALS &amp; CONSTRUCTION TECHNOLOGY – IV (ARC2402)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	2	2	5
Pre-requisites/Exposure	Building Materials & Construction Technology – III					
Co-requisites	Architectural Services					

### **Catalog Description**

The aim of this course is to develop understanding with RCC elements like column, beam etc. The knowledge about RCC is also enhanced through comprehension of RCC framed structures and reinforcement details in building elements like columns, beams, slab and lintels. The course gives complete knowledge about the various types of Cladding, false ceiling and surface finishes. Market survey and site visit studies shall be an essential part of the teaching – learning strategy.

### **Course Objectives**

The objective of this course is

- To make students aware of joining details of columns, beams and slabs.
- To develop the ability to analyze the building construction methods and their applications.
- To equip students about the methods of designing various structural members using reinforced cement concrete.

### **Course Outcomes**

On completion of this course, the students will be able to

- CO1:** Apply basic information about construction procedures and reinforcement detailing about RCC elements like Columns, Beams and Slabs.
- CO2:** Apply various materials and fixing details of surface cladding
- CO3:** Explain joinery and fixing details of false ceiling.
- CO4:** Describe uses of different surface finished in interior and exterior surfaces.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction to RCC elements like Columns, Beams and Slabs</b> Reinforcement detailing of RCC building elements like columns, beams and slabs through sketches and site visits.	L1, L2	15
<b>MODULE 2: Cladding and Panelling</b> • Details of cladding of wall with stone, tiles, timber and steel framing • Construction of cavity wall with different thermal and acoustical system • Various types of panelling (glazed, wooden etc.), details for panelling	L1, L2, L3	20
<b>MODULE 3: False Ceiling</b> Advantages and disadvantages of False Ceiling, Detail understanding of Reflected Ceiling Plan, joinery and fixing details.	L1, L3, L4	10
<b>MODULE 4: Finishing Materials</b> SURFACE FINISHES: Paints and surface finishes; Composition, properties and methods of application of different types of paints: Oil, synthetic enamels, acrylic and other plastic emulsions and formulations, interior and exterior grade paints. Natural and synthetic clear varnishes, French polish. Cement based paints • FLOOR FINISHES: PCC, terrazzo, stone slabs, brick and terracotta tiles, Synthetic materials (PVC, Timber). Floors of industrial buildings & warehouses. Ceramic wall & floor tiles. • PLASTIC: Classification of plastic, moulding and fabrication, properties of plastic, use of plastic, PVC. Fiber glass. • MISCELLANEOUS MATERIALS: Cork, rubber, Gypsum, sealants, heat and sound insulation materials. • GLASS AND GLASS PRODUCTS: Plain, sheet, plate, textured, laminated, wired and shock resistant glass. Glass blocks, glass tiles, mirrors, heat reflecting glasses and Glass wool.	L1, L3, L4	15

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### **Text Books**

- Barry, R. (1999). *The Construction of Buildings Vol. 2*. 5th Ed. New Delhi: East-West Press.
- Chudley, R. (2008). *Building Construction Handbook*. 7th Ed. London: Butterworth-Heinemann.
- McKay, W. B. (2005). *Building Construction Metric Vol. I-IV*. 4th Ed. Mumbai: Orient Longman.
- Rangwala, S. C. (1963). *Building Construction: Materials and types of Construction*. 3rd Ed. New York: John Wiley and Sons

## References

- Clayton, C. R. (1987). Materials science and engineering: An introduction. *Materials Science and Engineering*, 94, 266–267. [https://doi.org/10.1016/0025-5416\(87\)90343-0](https://doi.org/10.1016/0025-5416(87)90343-0).
- Fernandes, F. M., Lourenço, P. B., & Castro, F. (2010). Ancient Clay Bricks: Manufacture and Properties. In *Materials, Technologies and Practice in Historic Heritage Structures* (pp. 29–48). Springer Netherlands. [https://doi.org/10.1007/978-90-481-2684-2\\_3](https://doi.org/10.1007/978-90-481-2684-2_3)
- Freidin, K., & Erell, E. (1995). Bricks made of coal fly-ash and slag, cured in the open air. *Cement and Concrete Composites*, 17(4), 289–300. [https://doi.org/10.1016/0958-9465\(95\)00017-7](https://doi.org/10.1016/0958-9465(95)00017-7)
- Saikia, N., & De Brito, J. (2012, September). Use of plastic waste as aggregate in cement mortar and concrete preparation: A review. *Construction and Building Materials*. <https://doi.org/10.1016/j.conbuildmat.2012.02.066>

## Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	5	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO2	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO3	1	1	2	--	1	--	--	-	-	-	--	2	2	1	-	--
CO4																

1: strongly related, 2: moderately related and 3: weakly related

	<b>STRUCTURE - IV (ARC2409)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Structure –III					
Co-requisites	Structure – V					

### **Catalog Description**

The aim of this course is to enable students to understand various principles of strength of materials especially in case of beams, columns and trusses. The course covers deflection of beams, forces in members of truss, condition of equilibrium and displacement methods.

### **Course Objectives**

The objective of this course is

- To understand rational basis of the design of reinforced concrete members and structures through advanced materials and structural behavior.
- To enable students to undertake problems, identify, formulate and solve the critical thought, rational inquiry and self-directed learning.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Describe the building materials used in construction such as cement, fine and coarse aggregate, reinforcement, etc.

**CO2:** Design a slab for given building floor for different end support conditions.

**CO3:** Design a column for given axial load and moments.

**CO4:** Develop understanding about complex foundations and the construction techniques involved.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Material and Design Method</b> Cement, Fine and Coarse Aggregate, Water, Admixtures, Reinforcements, Properties and Tests For Concrete, WSM Vs LSM, Soil Mechanics, Basis Of Soil Properties, Soil Type, Bearing Capacity, Terzaghi's And Skempton's Formula.	L1, L2	09
<b>MODULE 2: Beams and Slabs Using LSM and WSM</b> Singly Beam, Doubly Beams, T, L Beams, Slabs – Rectangle, Circular, One Way, Two Way, Flat. Using IS 456:2000 And SP -16, Continuous Beams and Slabs.	L1, L2	09
<b>MODULE 3: Column and Footing</b> Short column and long column, minimum eccentricity, column subjected to combined axial load, uniaxial bending and biaxial bending, design of footing.	L1, L2	09
<b>MODULE 4: Pile and Raft Foundation</b> Design Of RCC Piles, Pile Caps, Raft Foundation (Theory)	L1, L2	09

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### **Text Books**

- Arya, C. (2009). Eurocode 3: Design of steel structures. In Design of Structural Elements (pp. 375–433). CRC Press. <https://doi.org/10.1201/b18121-13>
- Emmitt, S., & Gorse, C. (2014). Barry's Advanced Construction Of Buildings Third edition. John Wiley & Sons, Ltd (Vol. 28, p. 581).
- Salvadori, M., & Heller, R. (1986). Structure In Architecture: The Building Of Buildings, Third Edition. Struct in Archit, The Build of Build, Third Ed. Prentice-Hall Inc.

### **References**

- Oppermann, R. H. (1941). Strength of materials, part I, elementary theory and problems. Journal of the Franklin Institute, 231(1), 96. [https://doi.org/10.1016/s00160032\(41\)90378-](https://doi.org/10.1016/s00160032(41)90378-)
- Von Glasersfeld, E. (2009). A model for the construction of elementary concepts (pp. 45– 50). AIP Publishing. <https://doi.org/10.1063/1.58258>

### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**



**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	2	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
<b>CO2</b>	2	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
<b>CO3</b>	2	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
<b>CO4</b>	2	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>COMPUTER APPLICATION - I (ARC2413)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Architectural Graphic Skills					
Co-requisites	Architectural Design –IV					

### **Catalog Description**

The aim of this course is to understand the available software technologies and their applications in Architectural Designs. In order to enable students to use computer systems, software's and hardware, teaching necessary digital skills are important aspect of the course. This course will help learners to prepare presentation drawings, generating 2D and rendered views in a short time. This would finally help them in Design studio to develop conceptual as well as final Plan.

### **Course Objectives**

The objective of this course is

- To introduce the students with the Photo editing software.
- To develop theoretical understanding of AutoCAD and its relevance in Architecture.
- To practice various commands of the Autocad.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Develop understanding of minimum system requirements and computer aided drafting

**CO2:** Comprehend Photoshop and its parameter as tools and its application in architecture

**CO3:** Comprehend computer aided drafting and its parameter as tools and its application in architecture

**CO4:** Evaluate CAD techniques for quicker methods and presentation skills

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction to Use of Photo Editing Software</b> Introduction to Photo editing, montaging as well as preparation of 2-D presentations.	L1, L2	2
<b>MODULE 2: Workshop on Photo Editing Software</b> Practice on Photo editing as well as preparation of 2-D presentations on Photoshop.	L1, L2	6
<b>MODULE 3: Introduction to Auto Cad (2-D) Software</b> Introduce to the drafting software for the graphic design, building planning. Explain the various ways to deal with the graphic drawings. Introduce to 2D-3D drawing concepts. Students learn the ability to Drafting, Editing and modification work to be done in the graphic presentation. Practice on the various AutoCAD commands through software User Interface. Conduct 2D Skills Workshop to train the students. Introduce to the draft skills and minimize errors in the presentation skills.	L1, L2, L3	8
<b>MODULE 4: Workshop on 2D drafting</b> Practice on the various Auto Cad commands through software User Interface. Conduct 2D Skills Workshop to train the students. Introduce to the Modelling skills and minimize errors in the presentation skills.	L4, L5, L6	20

\**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Texts

- George Omura, Brian C. Benton. (2018). *Mastering AutoCAD 2019 and AutoCAD LT 2019*. Syvex.

### References

- Byrnes, D. (2010). *AutoCAD 2011 for Dummies*. Wiley Publishing, Inc (pp. 1–512).
- Finkel, R. (2005). Operating systems. In *Computers, Software Engineering, and Digital Devices* (pp. 18-1-18–18). CRC Press. <https://doi.org/10.5117/mab.47.21471>
- Lampson, B. W. (1983). Hints for computer system design. In *Proceedings of the 9th ACM Symposium on Operating Systems Principles, SOSP 1983* (pp. 33–48). Association for Computing Machinery, Inc. <https://doi.org/10.1145/800217.806614>
- Subscribe to various Microsoft online free services, <https://www.microsoft.com/en-in>

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

## Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

## CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	3	--	1	--	--	--	--	--	--	-	1	2	-	--
CO2	1	--	1	--	1	--	--	--	--	--	--	-	1	2	-	--
CO3	2	--	1	--	1	--	--	--	3	2	--	-	1	2	-	--
CO4	2	--	1	2	1	--	--	--	3	2	--	-	1	2	-	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>VISUAL ARTS – IV (ARC2414)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Visual Arts – III					
Co-requisites	Architectural Design - IV					

### **Catalog Description**

The aim of this course is to provide practical learning in creative thinking. The course intends to build student interest in think creative and express freedom of expression in Art, Paintings, and model making. The design and creative thinking course helps analyse complex shapes, design and application of colour.

### **Course Objectives**

The objective of this course is

- To Create 2d, 3D Graphical forms in form of sculptures, murals, etc.
- To study the principles and understand the importance of audio visuals and photography in presenting architectural drawings.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Create 2d, 3D Graphic forms, size, and their proportions

**CO2:** Create sculptural art forms with different mediums

**CO3:** Apply photography techniques for better presentations

**CO4:** Understand the importance of ergonomics in designing

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: 3D Compositions</b> Basic components of 3-dimensional art, including subject, form, and content. Discussions centered on 3-dimensional design and concepts	L1, L2, L3	9
<b>MODULE 2: Sculpture</b> Different types of Sculpture, their masters and philosophy. Live scale murals and their uses in building with examples.	L1, L2, L3	9
<b>MODULE 3: Photography and Audio-Visual Presentation</b> Importance of photography, angles, views in field of art and architecture. Techniques to combine photography and audio into audio-visual presentations using softwares or in form of animated magazine.	L1, L2, L3, L4	9
<b>MODULE 4: Ergonomics and Furniture Design</b> Golden mean ratio, Principles of ergonomics and its importance in history of architecture. Studying furniture design through examples from Schools of Architecture. Exercises incorporating both terminologies.	L1, L2, L3, L4	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Photography and audio-visual book; available on [http://www.easdvalencia.com/download/international/incoming/educational\\_offer/Photography\\_and\\_audiovisual.pdf](http://www.easdvalencia.com/download/international/incoming/educational_offer/Photography_and_audiovisual.pdf)

### Reference Books

- Of visual and audiovisual aids in the foreign language; by Englewood. Cliffs, N. J.: Prentice Hall, 1966. Fenton, D. X.. Better Photography for Amateurs. 3rd ed. New York;
- Ching, F. (1975). *Architectural Drafting*. In *Architectural Graphics* (pp. 15–19). Elsevier. <https://doi.org/10.1016/b978-0-85139-066-6.50005-5>
- Guptill, a L., & Meyer, S. E. (1997). *Rendering in Pen and Ink. Proceedings of the 23rd annual conference on Computer graphics and interactive techniques SIGGRAPH 96* (Vol. 30, pp. 469–476). Retrieved from <http://portal.acm.org/citation.cfm?doid=237170.237287>
- Pencil Points reader: a journal for the drafting room, 1920-1943. (2004). *Choice Reviews Online*, 42(02), 42-0757-42-0757. <https://doi.org/10.5860/choice.42-0757>
- The American Institute of Architects. (2010). Architectural Graphic Standards for Residential Construction, 2nd Edition. *American Institute of Architects*, 1–720.

**Modes of Evaluation: Quiz/Assignment/ Seminar/Practical**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	75	5	100	0	0	0	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
CO2	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
CO3	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--
CO4	2	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>HISTORY OF ARCHITECTURE - IV (ARC2415)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	History of Architecture - III					
Co-requisites	Visual Arts – IV					

### **Catalog Description**

The aim of this course is to make students familiar with the characteristics of the history of World and the built environment from pre-history to the present; this course explores buildings and cities in their cultural, social, political, and religious contexts. This course will introduce the development of World architecture styles from the early Christian era to the Gothic era. The understanding of space development and structural quality based design approach would enable students to design smaller basic structures / houses with applicable structural principles and construction techniques in mind.

### **Course Objectives**

- To introduce architectural elements, forms, development trends, characteristics of construction techniques and technologies, buildings, civilization transformation over the time period.
- To familiarize the students with the socio-economic, historical, political influences of time period in Architectural development and identify the buildings and the major works of the period.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate
- To familiarize the students with the development of architectural form with reference to technology, style and character in Byzantine Architecture, Romanesque Architecture, Gothic Architecture, Renaissance and Baroque Architecture.

### **Course Outcomes**

On completion of this course, the students will be able to



**CO1:** Identify and analyze the construction of domes and pendentives in Byzantine Architecture.

**CO2:** Identify and analyze the various Gothic churches and their important architectural features.

**CO3:** Identify prominent historic building of Renaissance period.

**CO4:** Identify and analyze Baroque architecture and their important architectural features.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Byzantine Architecture</b>            Contribution of Byzantine architecture in the development of structural system – dome construction over square plan, Adoption of Greek cross in church layout, Use of mosaic and mural in interior. Salient buildings – Santa Sophia, Istanbul; St. Mark’s Cathedral, Venice.</p>	L1, L2	6
<p><b>MODULE 2: Gothic Architecture</b>            Introduction to society and culture of 1150 – 1350 AD in Europe. Development of Gothic church and its new elements: Pointed Arch window, Different arch types – lancet, equilateral, depressed, Trefoil arch, Cluster column and intersecting vault roof, Clerestory window and triforium, Flying buttress, Glazed window, stone and metal trellis, flamboyant window, rose window, Entrance of church. Salient buildings: Cathedrals of St. Dennis, Cathedrals of Chartres, , Cathedrals of Notre Dame (Paris), Cathedrals of Reims.</p>	L1, L2	6
<p><b>MODULE 3: Basic Introduction to Renaissance Architecture and its Classical Revivalism, Neo-Classicism</b>            Introduction to society and culture of 1400 -1800 AD, Division of Renaissance architecture into Early, Mature and Late periods. Contribution in structural system, e.g., ribbed dome, lantern dome. Revival of classical orders an principles – Neo-Classicism</p>	L1, L2	6
<p><b>MODULE 4: Baroque Architecture</b>            Dynamism and systemization of Baroque architecture vitality and spatial richness with underlying systematic organization. Space as constituent element of architecture, as a complex totality and indivisible figure, comprising of interacting spatial elements based on inner and outer forces. Sensitivity to effects of texture, color, light and water. Study of important urban spaces and churches in Italy and Germany</p>	L1, L2	6

*\*Bloom’s Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books**

- Sir Banister Fletcher, A History of Architecture, University of London, The AntholonePress, 1996.

- Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford University Press, London, 1985.
- Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
- Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams, Inc. Pub., New York, 1972

**Reference Books**

- S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd., London, 1986.
- Gosta, E. Samdstrp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
- Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
- Vincent Scully: Architecture; Architecture – The Natural and the Man Made: Harper Collins Pub: 1991.
- Christian Norberg-Schulz, Meaning in Western Architecture, Praeger, 1975
- Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, Ltd. 2007

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO4	1	1	--	--	--	--	--	--	--	--	--	--	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING SERVICES – II (ARC2416)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Building Materials And Construction Technology –III, Architectural Services- I					
Co-requisites	Architectural Design – IV					

### **Catalog Description**

The aim of this course is to give an overview and introduction of Noise Control, Acoustics, Gas installation and fire-fighting systems. In today’s architectural environment, good acoustical design isn’t a luxury – it’s a necessity. This course deals with the science behind sound and its application to achieve desired acoustical performance in a specific building by using different building materials, systems and technologies.

### **Course Objectives**

The objective of this course is

- To introduce to the theory and practices of Acoustics and Noise reduction.
- To introduce various building elements and their application in the built environment.
- To get familiarized with Gas installation techniques and requirements
- To understand the importance of Fire safety in a building.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Describe the theory of acoustics and its implementations in buildings like Auditorium, Lecture halls, etc.

**CO2:** Describe the different types of noise, their transmission and the measure to isolate and control them.

**CO3:** Design Gas installation system at residential and non-residential buildings.

**CO4:** Describe the installation of Fire safety measures in a building.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Building Acoustics</b> Terminology and unit. Characteristics of audible sound – Propagation, Velocity, Frequency, Pitch, Quality/timbre, Loudness and Intensity. Behavior of audible sound in enclosures – Reflection, Absorption, Diffraction and Transmission of sound. Common acoustical defects and recommended remedies– Echo, Sound foci, Dead spots, Sound shadows, Resonance, Insufficient loudness, External noise and Reverberation. Sabine’s expression for calculation of Reverberation time. Absorbents and absorption coefficient. Acoustical requirements as per NBC	L1, L2	6
<b>MODULE 2: Noise Control</b> Noise and its types, Noise pollution. Sources of indoor noise, Indoor noise levels, Planning and design against indoor noise. Sources of outdoor noise, Traffic noise levels, Planning and design against outdoor (traffic & buildings in built-up area) noise. Identification of various sources of noise and recommendations to control them in various types of buildings e.g. – Residential, Educational, Hospital, Office, Hotels & Hostels, Industrial, Laboratories & Test houses, Miscellaneous buildings etc.	L1, L2	6
<b>MODULE 3: Gas Installation</b> L.P.G / Bio-gas installations, their location and layouts in residential and non-residential buildings	L4, L5, L6	6
<b>MODULE 4: Fire Safety System</b> Causes and spread of fire. Fire triangle/ tetrahedron. Classes of fire. Combustibility of materials and fire resistance. Building Plans, Drawings, and Schematics. Fire Detection Equipment- Heat &Smoke sensors. Fire Alarm Systems. Firefighting pump and water storage, Hose and hose fittings, Dry and wet risers, Automatic sprinklers. Fire Extinguishers - Portable fire extinguisher and other firefighting equipments. Means of escape, Fire escape, Fire doors and Water curtain. Passive means of fire fighting and building design criteria as per NBC.	L4, L5, L6	6

*\*Bloom’s Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- John E. Traister (1995), Security/Fire Alarm Systems: Design, Installation, and Maintenance.
- An Introduction to Acoustics. (1952). Physics Today, 5(11), 24. <https://doi.org/10.1063/1.3067395>
- Bruneau, M. (2010). Fundamentals of Acoustics. Fundamentals of Acoustics. Wiley-ISTE. <https://doi.org/10.1002/9780470612439>

- Springer handbook of acoustics. (2008). Choice Reviews Online, 45(05), 45-2674-45-2674. <https://doi.org/10.5860/choice.45-2674>
- S. Kandaswamy (2005), Architectural Acoustics and Noise Control, Allied publishers Pvt. Ltd.,
- National Building Code of India

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	--	1	--	--	--	--	--	--	--	--	--	2	1	--	--
CO2	--	--	1	--	--	--	--	--	--	--	--	--	2	1	--	--
CO3	2	--	1	--	--	--	--	--	--	--	--	--	2	1	--	--
CO4	--	--	1	--	--	--	--	--	--	--	--	-	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Fifth Semester

	<b>ARCHITECTURAL DESIGN – V</b>	L	T	S	P	C
	<b>(ARC2501)</b>					
Version 1.1	Date of Approval:	1	1	4	2	8
Pre-requisites/Exposure	Architectural Design – IV					
Co-requisites	Architectural Graphic Skills - V					

### **Catalog Description**

The aim of this subject is to emphasize be on creative and rational skills for problem solving in architectural buildings on real site. Design-problem may focus on form follows function and horizontal and vertical zoning. The first step of the design phase is the schematic design. The schematic design is where the student will gathers information on the needs, style, and wants for the project and from there they will create design options. Then second phase will be Design Development In the design development, the students will take the schematic designs and develop them to an approved design concept. Design focuses to create a space that flows with its surroundings. Also it merges with the aesthetic and function of the structure.

*Design Exercises: Sports Complex, Exhibition hall, Interpretation Centre, Showrooms, Cultural Centre, etc.*

### **Course Objectives**

The objective of this course is to

- To explore the design of buildings addressing the socio – cultural & economic needs of contemporary society.
- To enable the students to understand the importance of spatial planning within the constraints of Development Regulations in force for urban areas.
- To enable the students to design for large groups of people in a socially and culturally sensitive manner, taking into account aspects such as user perception, crowd behavior, large scale movement of people and identity of buildings.
- To emphasis on the importance of understanding the relationship between open space and built form, built form to build form and site planning principles involving landscaping circulation network and parking.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Design a Project involving multiple space utilization like Sports Complex, Exhibition hall, Interpretation Centre, Showrooms, Cultural Centre, etc.

**CO2:** Build with precision block models, study models, site models

**CO3:** Demonstrates architectural and composite structural system and services.

**CO4:** Communicate through drawings or models.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction</b> Design problem may be introduced, Site visit, Site analysis, Designing the design programme.	L4, L5, L6	15
<b>MODULE 2: Development of Concept</b> Collecting and analysing data of various spaces, Area programming, Flow diagram, Single line graphics and study models.	L4, L5, L6	15
<b>MODULE 3: Design Development</b> Integrate the knowledge gained from previous theory based subjects like Building services, Building materials and Construction Technology, Structure, etc., and apply to detail out their design proposal.	L4, L5, L6	30
<b>MODULE 4: Final Design Proposal</b>	L4, L5,	36

The final design proposal is prepared after conducting various informal and formal reviews at individual and at group level. The drawing and detail physical model explaining the approach and consideration of urban setting to achieve the requirements with various other restrictions may be submittals.	L6	
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*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books/ References:

- Frampton, Kenneth. (1980). *Modern Architecture: A Critical History*. London: Thames and Hudson.
- Francis D.K. Ching (1979), *Architecture: Form, Space and Order*, John Wiley & Sons Publication
- Hays, K. Michael, ed. (1998). *Architecture Theory Since 1968*. Cambridge: MIT.
- N D Bhatt, (2014). *Engineering Drawing, (Plane and solid geometry)*, Delhi, Charotar Publishing house.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	8	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	2	--	--	--	--	--	--	-	1	2	--	--
CO2	1	1	1	1	2	--	--	--	--	--	--	-	1	2	--	--
CO3	1	2	1	2	2	-	-	-	-	-	-	-	1	2	-	3
CO4	2	1	2	2	2	-	-	-	-	-	-	-	2	1	-	2

1: strongly related, 2: moderately related and 3: weakly related



	<b>BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY – V (ARC2502)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	2	2	5
Pre-requisites/Exposure	Building Materials And Construction Technology – IV					
Co-requisites	Architectural Services – III					

### Catalog Description

The aim of this course is to continue with metal as the main building material. The study is concerned with special doors and windows to steel doors, windows and partitions. The knowledge about RCC is also enhanced through comprehension of RCC framed structures and reinforcement details in building elements like columns, beams, slab and lintels. Students are familiarized with the types of metal shutters and partitions, doors and windows, their application and construction details in steel and aluminium sections. The subject should be integrated with ongoing subjects like Architectural Design and Building services.

### Course Objectives

The objective of this course is to

- To familiarize the students with various types of metal doors.
- To develop understanding about framed structure in terms of reinforcement and construction details.
- To familiarize students with doors and windows in steel and aluminum sections. Also integration of openings with partitions in steel and aluminum used in interior of buildings

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define various types of door and windows used in different situations from day to day life.

**CO2:** Comprehend the details of metal doors.

**CO3:** Comprehend the details/ arrangements of reinforcement.

**CO4:** Evaluate the best suitable material and type of Door, Window and Partitions.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Special Doors and Shutters</b> Different types of doors; sliding, sliding and folding, revolving doors, collapsible shutters, rolling shutters, types of rolling shutters in conventional and contemporary materials. The installation, working and mechanism of such doors and shutter	L1, L2, L3	10
<b>MODULE 2: Metal Doors</b> Doors in steel, aluminum along with technical terminology involved. Types and varieties of available sections in steel and aluminum in market and their application in providing doors. Design considerations and construction details in congruence to IS codes and manuals provided by CPWD and other organizations.	L1, L2, L3	10
<b>MODULE 3: RCC Details of Framed Structures</b> Reinforcement and design details of Footings, Columns, beams, slab and lintels. Buttresses and Retaining Walls: Details of construction of Buttresses and retaining walls.	L1, L2, L3, L4	20
<b>MODULE 4: Metal Windows and Partitions</b> Windows and Partitions in steel, aluminum along with technical terminology involved. Types and varieties of available sections in steel and aluminum in market and their application in providing windows and partitions. Design considerations and construction details in congruence to IS codes and manuals provided by CPWD and other organizations.	L1, L2, L3	20

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- da Silva, L. S., Simões, R., & Gervásio, H. (2014). Design of Steel Structures. Design of Steel Structures (pp. 1–438). Wiley. <https://doi.org/10.1002/9783433604229>
- Khurmi, R. S. (1991), Strength of Materials. New Delhi: S.Chand Publishers
- MacGinley, T. J. (2018). Structural steel design. In Steel Structures (pp. 32–54). CRC Press. <https://doi.org/10.1201/9781315274966-3>
- Punmia, B.C. (2005). Building Construction, New Delhi: Laxmi Publishers
- Rangawala, (2017). Building Construction, Gujarat:Charotar publishe

### **Reference Books**

- Lane, J., & Lane, J. (2018). Windows and doors. In Aluminium in Building (pp. 89–102). Routledge. <https://doi.org/10.4324/9780429463372-10>

- Pappu, A., Saxena, M., & Asolekar, S. R. (2007). Solid wastes generation in India and their recycling potential in building materials. *Building and Environment*, 42(6), 2311– 2320. <https://doi.org/10.1016/j.buildenv.2006.04.015>
- Venkatarama Reddy, B. V. (2004, October 10). Sustainable building technologies. *Current Science*.
- Yang, L., & Shi, J. J. (2010). Experimental study on the impact of rainfall on RCC construction. *Journal of Construction Engineering and Management*, 136(5), 477–483. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0000156](https://doi.org/10.1061/(ASCE)CO.1943-7862.0000156)

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme							Total marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ				Total
I	II									
10	10	25	5	50	0	50	50	100	5	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	-	--	--	2	--	--	--	--	--	--	--	3	1	--	--
CO2	3	-	--	--	1	--	--	--	--	--	--	--	2	1	--	--
CO3	3	-	--	--	2	--	--	--	--	--	--	--	2	1	--	--
CO4	2	-	--	--	1	--	--	--	--	--	--	--	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>STRUCTURE - V (ARC2509)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Structure – IV					
Co-requisites	Building Materials & Construction Technology – V					

### **Catalog Description**

The aim of this course is to enable students to design steel structures and also an overview of alternative building materials. The course covers knowledge of materials such as cement, aggregate, grades of concrete, steel structures. The course would enable students to design simple RCC structures and their basic components, viz, columns, beams, slabs and staircases. This course covers staircase design, retaining wall, portal frames, masonry structures, pre-stressed and post stressed concrete.

### **Course Objectives**

The objective of this course is

- To understand the analysis of in-determinant structures and their use in field in greater depth.
- To design different types of staircase with various materials.
- To make students aware of column footing.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Design a dogleg staircase for given stair well space in residential or public building.

**CO2:** Explain the alternatives of long span structures.

**CO3:** Apply composite materials for masonry works.

**CO4:** Summarize the conceptual idea behind the development of pre-stressed structural component for general use.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Design of Staircase and Retaining Wall</b> General Features, Types of Staircase, Distribution of Loading on Stairs, Wall Proportions, Design Principles, Counterfort Retaining Walls.	L1, L2	09
<b>MODULE 2: Portal Frames</b> Design of Portal Frames with Hinged Base, Design of Portal Frames with Fixed Base, Structural Analysis and Design of Grid Floor, Slab Culvert Rectangular – Beam Deck.	L1, L2	09
<b>MODULE 3: Masonry Structures</b> Introduction, Masonry Walls, Design of Wall and Column Footing	L1, L2	09
<b>MODULE 4: Design principles and high-rise structures</b> Elements of Pre-Stressed and post tensioning Concrete, Principles and System, Loss, Analysis and Design of Pre-Stress and post tensioned Beam.	L1, L2	09

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### **Text Books**

- Arya, C. (2009). Eurocode 3: Design of steel structures. In Design of Structural Elements (pp. 375–433). CRC Press. <https://doi.org/10.1201/b18121-13>
- Emmitt, S., & Gorse, C. (2014). Barry's Advanced Construction Of Buildings Third edition. John Wiley & Sons, Ltd (Vol. 28, p. 581).
- Salvadori, M., & Heller, R. (1986). Structure In Architecture: The Building Of Buildings, Third Edition. Struct in Archit, The Build of Build, Third Ed. Prentice-Hall Inc.
- Oppermann, R. H. (1941). Strength of materials, part I, elementary theory and problems. Journal of the Franklin Institute, 231(1), 96. [https://doi.org/10.1016/s00160032\(41\)90378-](https://doi.org/10.1016/s00160032(41)90378-)
- Von Glasersfeld, E. (2009). A model for the construction of elementary concepts (pp. 45– 50). AIP Publishing. <https://doi.org/10.1063/1.58258>

### **References**

- Roeder, C. W., & MacRae, F. A. (1997). Steel structures. Advances in Earthquake Engineering (Vol. 3, pp. 533–561). Computational Mechanics Publ. <https://doi.org/10.1201/9781420037135.ch1>
- Solanki, H., & Gogate, A. (1998). Flanged deep beams. In Reinforced Concrete Deep Beams. Spon Press. <https://doi.org/10.4324/9780203034880.ch5>
- Venkatarama Reddy, B. V. (2004, October 10). Sustainable building technologies. Current Science

### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

#### **Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	--	--	1	--	--	--	--	--	--	--	--	2	1	--	--
CO2	2	--	--	2	--	--	--	--	--	--	--	--	--	1	--	--
CO3	--	3	--	1	--	--	--	--	--	--	--	--	--	1	--	--
CO4	2	--	--	2	--	--	--	--	--	--	--	--	3	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>COMPUTER APPLICATIONS- II</b> <b>(ARC2513)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Computer Applications - I					
Co-requisites	Landscape Design					

### **Catalog Description**

The aim of this subject is to introduce techniques for further refinement of computer generated graphics covered in the previous semester. In addition to that, this course also trains students for developing photorealistic modeling using popular software in the field of architecture. Advanced technologies and concepts using computers as an essential tool are also introduced such as Building Information Modeling. This course equips students with soft skills which increase their productivity and expression in design related subjects.

### **Course Objectives**

The objective of this course is

1. To introduce and make students learn about graphic presentation tools
2. To introduce Sketch up as 3D drafting software.
3. To introduce Revit as 3D drafting software and its allied rendering plugins.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Prepare building design through sketch up software..

**CO2:** Prepare building design through revit software.

**CO3:** Render the drawings in various rendering plugins.

**CO4:** Train others in various types of softwares such as revit, sketch up.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to SketchUp (3-D) Software</b> Introduce to the Sketch up 3D software for the graphic design, building planning. Explain the various ways to deal with the graphic drawings. Introduce to 3D drawing concepts. Students learn the ability to Model, Editing and modification work to be done in the graphic presentation.	L1, L2	12
<b>MODULE 2: Introduction to Revit (3-D) Software</b> Introduce to the Revit 3D software for the graphic design, building planning. Explain the various ways to deal with the graphic drawings. Students learn the ability to Building Information Modeling.	L4, L5, L6	8
<b>MODULE 3: Introduction to Rendering Plugins</b> Introduce to the Lumion and Twilight Render software for the Rendering.	L1, L2	4
<b>MODULE 4: Workshop</b> Practice on the various Revit and Sketch Up commands through software User Interface. Conduct 3D Skills Workshop to train the students. Introduce to the Modelling skills and minimize errors in the presentation skills.	L4, L5, L6	12

\**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### Text & Reference Books

- Brewster, R. (2014). Paint.NET - Free Software for Digital Photo Editing. [Http://www.Getpaint.Net/Index.Html](http://www.getpaint.net/index.html) (Accessed June 2015).
- Khan, E., Reinhard, E., Fleming, R., & Bühlhoff, H. (2005). Image-based material editing. In *ACM SIGGRAPH 2005 Sketches, SIGGRAPH 2005* (p. 148). Association for Computing Machinery, Inc. <https://doi.org/10.1145/1187112.1187291>
- Kholgade, N., Simon, T., Efros, A., & Sheikh, Y. (2014). 3D object manipulation in a single photograph using stock 3D models. In *ACM Transactions on Graphics* (Vol. 33). Association for Computing Machinery. <https://doi.org/10.1145/2601097.2601209>.
- Kirk, D. S., Sellen, A. J., Rother, C., & Wood, K. R. (2006). Understanding photowork. In *Conference on Human Factors in Computing Systems - Proceedings* (Vol. 2, pp. 761–770). <https://doi.org/10.1145/1124772.1124885>

#### Modes of Evaluation: Assignment/Written Examination

##### Examination Scheme:

Evaluation Scheme						Total Marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment					
CT		TA	A	Total	ESE				ESJ
I	II								



10	10	25	5	50	0	50	50	100	3	0
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CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	3	--	--	2	--	--	--	-	-	--	-	3	1	-	--
CO2	--	2	--	--	1	--	--	-	-	-	--	-	2	1	-	--
CO3	--	2	--	--	1	--	--	-	-	-	--	-	2	1	-	--
CO4	--	3	--	--	1	--	--	--	-	-	--	-	2	1	-	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>THEORY OF ARCHITECTURE – I (ARC2517)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	History of Architecture					
Co-requisites	Architectural Design – V					

### Catalog Description

The aim of the course is to provide the fundamental concepts of design, elements of design & theory of design with their application in design projects. Also this course will introduce the works of great master's like- Frank Lloyd Wright, Le-Corbusier, Louis Sullivan etc. with the reference of National and International case studies.

### Course Objectives

The objective of this course is

1. To have knowledge of Roman, Romanesque, Baroque, Colonial style of architecture.
2. To understand, different architectural theories given by practicing architects.
3. To understand the elements of architecture
4. To introduce the work of Indian Architects like- Charles Chorrea, B.V. Doshi, Raj Rewal

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain basic architectural features of public buildings in Britain and France.

**CO2:** Knowledge about different theories like- Five points of Architecture by Le-Corbusier

**CO3:** Differentiate building materials and construction technology adopted in high rise structures.

**CO4:** Students will be able to discuss the work of B.V. Doshi & Raj Rewal

Modules	Blooms level*	Number of hours
<b>MODULE 1: Historical study</b> Purity of form with structural honesty obtained in different periods – Roman, Romanesque, baroque, Colonial Architecture etc. leading to modern Architecture. Study of important palaces and public buildings in Britain and France.	L1, L2	6

<p><b>MODULE 2: Architectural Theory</b>          Discuss the evolution and development in design process from past to present. Discuss the principles and Elements of design followed in buildings in past and how the trend changed over the period as per demand.          Compare the buildings of past with the present and study the technological, form, shape, design, planning and construction material etc. from earlier days to present day</p>	L1, L2,	6
<p><b>MODULE 3: Modern Architecture</b>          Belief in creation of “new” and “ideal” world through the fundamentals of true and original. Origin of geometry, nature, simplicity, abstraction, non-objective, construction and technology available at that times. Equating technology and progress with present functionalism and appropriateness.          Works of great masters – Frank Lloyd Wright, Le-Cobusier, Alvar Alto, Mies Vender, Louis Kahn, Louis Sullivan, Edwin Lutyen etc.</p>	L1, L2,L4	6
<p><b>MODULE 4: Great Masters of the period</b>          Works of the great masters of the period in India i.e.- Charles Chorrea, B.V. Doshi, Raj Rewal, Achyut Knvinde, Hafeez Contractor etc.</p>	L1, L3, L4	6

\*Bloom’s Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

**Text/Reference Books**

- A.B. Gallion (1986), *Ubrban Pattern: City Planning and Design*, Van Nostrand Reinhold; Subsequent
- Sir Bannister Fletcher. (1896), *The History of Architecture*, Oxford, Boston, Architectural Press
- Van De Ven, F. H. M., Nelen, A. J. M., & Geldof, G. D. (1992). *Urban drainage. In Drainage Design* (pp. 118–150). Springer US.

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3	PSO 4
CO1	1	-	1	--	--	1	2	1	--	--	-	3	-	-	1	2
CO2	1	-	1	--	--	1	2	1	-	--	-	3	-	-	1	2

<b>CO3</b>	1	-	1	--	--	1	2	1	-	--	-	3	-	-	1	2
<b>CO4</b>	1	-	1	-	-	-	-	-	-	-	-	3	-	-	-	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING SERVICES – III (ARC2518)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Building Materials And Construction Technology –IV, Architectural Services- II					
Co-requisites	Architectural Design – V					

### **Catalog Description**

The aim of this course is to introduce the basic concepts of Electrical system design at the building planning level. Building services engineers are responsible for the design, installation, and operation and monitoring of the mechanical, electrical and public health systems required for the safe, comfortable and environmentally operation of modern buildings. The course module can help students to understand the basic concepts of electrical and mechanical circulation systems to make the building comfortable, functional, efficient and safe for use.

### **Course Objectives**

The objective of this course is

- To familiarize the student with theoretical and practical aspects of Electrical Systems and Components of Home Electrical Design.
- To develop perception regarding the various norms and standards for Electrical Systems and Lighting.
- To increase knowledge capacity of the students in the, HVAC system and Ventilation.

### **Course Outcomes**

On completion of this course, the students will be able to

- CO1:** Discuss the active and passive components of Electrical system and various principles.
- CO2:** Develop understanding for Electrical and illumination system for Small building.
- CO3:** Discuss the active and passive components of HVAC and their underlying principles.
- CO4:** Discuss the importance of ventilation systems in buildings.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Electrical System</b></p> <p>Terminology and architectural symbols (as per NBC/NEC) for electric installations in buildings. Need to generate and save electricity, transmission and distribution of electricity (single and three phases), procuring service connection. Familiarization to various lighting accessories, wires and cables, metering, distribution panels / boards etc. for single and three phase supply. Basic considerations. Various types of internal wiring systems e.g. cleat, casing and capping, batten and conduit (surface &amp; concealed). Introduction to various types of protection devices e.g. switches, fuses and circuit breakers.</p>	L1, L2, L3	6
<p><b>MODULE 2: Lighting and Illumination</b></p> <p>Terminology and unit. Light and its characteristics – scattering, propagation, transmission, reflection, absorption, refraction and dispersion of light. Different types of source of lights: Thermal radiators - Incandescent, Halogen. Discharge lamps– Low pressure (fluorescent, compact fluorescent, sodium, cold cathode neon), High pressure (mercury, metal halide, sodium). New technologies - LED, Fiberoptics. Luminaries – Types of Luminaries – Indirect, Semi-indirect, General diffusing, Semi-direct and Direct. Types of illumination schemes e.g. Ambient, Task, Focal and Decorative etc. Design considerations for illumination Schemes. Methods for lighting calculation – Watts per square meter, Light flux and Point to point method.</p>	L1, L2, L3	6
<p><b>MODULE 3: HVAC</b></p> <p>Introduce to the basic concepts of Air Conditioning, function, scope and purpose. Share relevant Indian BIS and ASHRAE standards. Study relationship of Human Comfort, Dry/Wet/Dew Bulb Temperature, Climatology principles, Psychrometric Chart Analysis, and study HVAC design considerations in typical building case</p>	L1, L2, L3	6
<p><b>MODULE 4: Ventilation</b></p> <p>Introduction of the importance on ventilation in a building. Types and means of ventilation systems. Natural ventilation, Stack effect, Direct and Indirect ventilation, Placement of windows and openings.</p>	L1, L2, L3	6

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- National Electrical Code.
- Raina K.B. & Bhattacharya S.K., Electrical Design estimating and costing, New Age International (P) Limited, New Delhi,2004.
- Rudiger Ganslandt & Harald Hofmann, Handbook of Lighting Design, Druckhaus Maack, Lüdenscheid, 1992.

- Kevin Kelly & Kevin O'Connell, Interior Lighting Design - A Student's Guide
- IS SP 7-NBC : National Building Code of India 2016, Bureau of Indian Standards (2016)
- NBC-2005, National Building Code of India - 2005, Bureau of Indian Standards, New Delhi 2005

## References

- Electrical power systems quality. (1996). Choice Reviews Online, 34(01), 34-0322-34-0322. <https://doi.org/10.5860/choice.34-0322>
- Murty, P. S. R. (2017). Electrical power systems. Electrical Power Systems (pp. 1–814). Elsevier Inc. <https://doi.org/10.1016/b978-0-08-100975-8.00006-0>
- ASHRAE. (2011). ASHRAE Handbook - HVAC Applications. www.ansi.org American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (pp. 1–1104).
- Pérez-Lombard, L., Ortiz, J., Coronel, J. F., & Maestre, I. R. (2011, February). A review of HVAC systems requirements in building energy regulations. Energy and Buildings. <https://doi.org/10.1016/j.enbuild.2010.10.025>
- Vakiloroyaya, V., Samali, B., Fakhar, A., & Pishghadam, K. (2014). A review of different strategies for HVAC energy saving. Energy Conversion and Management, 77, 738–754. <https://doi.org/10.1016/j.enconman.2013.10.023>
- Wang, S., & Ma, Z. (2008). Supervisory and optimal control of building HVAC systems: A review. HVAC and R Research, 14(1), 3–32. <https://doi.org/10.1080/10789669.2008.10390991>

## Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

### Examination Scheme:

Evaluation Scheme								Total marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

## CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	2	--	--	--	3	--	--	--	--	--	--	1	--	2
CO2	2	--	1	--	--	--	3	--	--	--	--	--	--	1	--	2
CO3	2	--	1	--	--	--	2	--	--	--	--	--	--	1	--	2
CO4	2	--	1	--	--	--	2	--	--	--	--	-	--	1	--	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE - PEOPLE CULTURE AND BUILT ENVIRONMENT- I</b> <b>(ARC2519)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	History of Architecture, Architectural Design – III					
Co-requisites	Theory of Architecture					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in psychological and sociological aspects which are of concern to Architecture. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide students the exposure to understanding society and various built forms produced by society. The course will also provide the students hands-on cultural, sociological and psychological studies of the built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross fertilization with other courses. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on projects. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To understand the basic principles of psychology, sociology and culture of settlement.
- The course intends to study and understand the typical components of city in order to appreciate how these elements contribute to the quality of life of urban communities.
- To familiarize students with decisive strategies that brings inclusivity and equality in the designs of built forms.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to



**CO1:** Develop a relationship between man and his larger social environment, with special emphasis on aspects that are likely to affect intervention in or creation of, the built environment (predominantly urban)

**CO2:** Develop a language and vocabulary for discussions/ analysis on the sociological/ psychological dimensions of architecture.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Psychology, Sociology and Built Environment</b>            Basic introduction to various critical social aspects; Role of psychology in architecture; Role of sociology in built environment; Determinants of sociology- social structure, social status, social control, social institutions, social mobility; Inclusive Built Environment; Barrier free designs and built environments;            Various case studies related to gender and architecture, community development- community response towards development strategy etc.</p>	L1, L2	8
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	16

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books/References**

- Cragun R.T.(2006). Introduction to Sociology, Wikibooks.
- Giddens, A (2006) Sociology, Polity Press, Cambridge (UK)
- Lynch, K. (1960) The Image of the City, Joint Centre Publication, USA
- Oomen T.K. and Venugopal C.N. (2004), Sociology, Eastern Book Company.
- Porteous, Douglas, J. (1977), Environment Behaviour: Planning and Everyday Urban Life, Addison Wesley
- Sinha A. (2013) “An India for Everyone: A Path of Inclusive Development, Harpercollins
- Steve Barkan (2010), Sociology: Understanding and Changing the Social World, Flat World Reference Books

- Tejchman A. (2016) “The Politics of Inclusive Development”, Palgrave Macmillan.

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE- ECOLOGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT – I (ARC2520)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Environmental Sciences, Building Services-1, Building Services-2					
Co-requisites	Architectural Design, Building Services-3					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in ecology, environment and sustainable aspects which are of concern to Architecture. The course will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide students the exposure to understanding ecology and various environmental problems faced by settlements. The course will also provide the students hands-on ecological and environmental studies of built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross learning with other courses. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on projects. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To understand the basic principles of ecology, environment and sustainable development.
- The course intends to study and understand the different components of city in order to understand how these elements contribute to environment quality.
- To establish the significance of the ecological issues, their impact and initiatives to address the same in the built environs to achieve sustainable development.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

- CO1:** Develop a relationship between man and ecology, will understand critical environmental issues and need to address the m by using advanced technology.

**CO2:** Produce reports and presentation.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Ecology, Environment and Sustainable Development</b>            Basic introduction to ecology; Interrelation between natural and built environment; Importance of environment sustainability in built environment; Energy conservation, renewable sources: wind, solar, geothermal, bio-fuels; Materials minimizing, recycling, reducing energy content, etc; Other environmental issues related to solid waste management, water resources, air quality, storm water drainage etc;            Various case studies related to traditional / vernacular buildings and settlements demonstrating relationship between climate, local material resources and settlement/ building forms.</p>	L1, L2	8
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	16

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books/References

- Bakari, Mohamed El-Kamel (2017). The Dilemma of Sustainability in the Age of Globalization: A Quest for a Paradigm of Development. New York: Lexington Books. ISBN 978-1498551397
- Blewitt, J. (2008). Understanding Sustainable Development. London: Earthscan. pp. 21–24. ISBN 978-1-84407-454-9.
- Fulekar, M. H., Pathak, B., Kale, R. K. (2014) Environment and Sustainable Development' Springer Nature; ISBN-10: 8132211650; ISBN-13: 978-8132211655
- Goudie, Andrew (2000). The Human Impact on the Natural Environment. Cambridge, Massachusetts: This MIT Press. pp. 203–239. ISBN 0-262-57138-2.
- James, Paul (2014). Urban Sustainability in Theory and Practice. doi:10.4324/9781315765747. ISBN 978-1-315-76574-7.
- James, Paul; Magee, Liam (2016). "Domains of Sustainability". In A. Farazmand (ed.). *Global Encyclopedia of Public Administration, Public Policy, and Governance*. Springer.
- Modak, P. (2017) Environmental Management Towards Sustainability, CRC Press, ISBN-10: 9781498796248

- *Odum, E. P. (1971). Fundamentals of Ecology (Third ed.). New York: Saunders. ISBN 0-7216-6941-7.*
- *Porteous, Douglas, J. (1977), Environment Behaviour: Planning and Everyday Urban Life, Addison Wesley*
- *Thangavel, P., Sridevi, G. (2015) Environmental Sustainability, Springer Nature, ISBN-10: 9788132220558*
- *Walker, Brian and Salt, David (2006) Resilience Thinking: Sustaining ecosystems and people in a changing world. Island Press. p. xiii. ISBN 978-1597260930.*
- *Wandenberg, JC (August 2015). Sustainable by Design. Amazon. p. 122. ISBN 978-1516901784*

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE - COMPUTER APPLICATIONS AND ADVANCE TECHNOLOGIES - I (ARC2521)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Architectural Graphic Skills					
Co-requisites	Architectural Design, Building Materials and Construction Technology					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in computer applications and advance technologies which are of concern to Architecture. The course will generally be conducted in the tutorial mode to encourage exploration and skill developments. The aim of this course is to provide students the exposure to understanding new technological innovations and their applications in field of architecture. The course will also provide the students hands-on experience of new software and applications. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross learning with other courses. The course would be conducted through data base creation, analysis, presentation. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To familiarize students with use of computers in architecture and with impact of Information Technology on architectural knowledge system and practice.
- To critically explore current advancements in smart technologies available for sustainable built environments.
- To sensitize students about strategies for innovations by using latest technologies.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Comprehend the latest software and computer applications available in the field of architecture.

**CO2:** Explain new advanced technologies available for architecture.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to computer applications and advance technologies</b></p> <p>Basic introduction to information technology in architecture; Introduction to smart technologies in field of architecture; Applications of information technology in architecture; applications of smart technologies in architecture;</p> <p>Case studies related to use of information technology and advance technology in architecture and built environment. .</p>	L1, L2	9
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of project; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L3, L4, L5, L6	18

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books/References

- Ching, F. D. (2009) Architectural Graphics, John Wiley and Sons
- D'Ulizia, A., Ferri, F., Grifoni, P., & Guzzo, T. (2010). Smart homes to support elderly people: innovative technologies and social impacts. In *Pervasive and Smart Technologies for Healthcare: Ubiquitous Methodologies and Tools* (pp. 25-38). IGI Global.
- Deakin, Mark; Al Waer, Husam (2011). "From Intelligent to Smart Cities". *Journal of Intelligent Buildings International: From Intelligent Cities to Smart Cities*. 3 (3): 140–152.
- Graham, S.; Marvin, S. (1996). *Telecommunications and the city: electronic spaces, urban place*. London: Routledge. ISBN 9780203430453.
- Kedar, Seema (2009). *Database Management System* Technical Publications. ISBN 9788184316049.
- Komninos, Nicos (22 August 2013). "What makes cities intelligent?". In Deakin, Mark (ed.). *Smart Cities: Governing, Modelling and Analysing the Transition*. Taylor and Francis. p. 77. ISBN 978-1135124144
- McLaren, Duncan; Agyeman, Julian (2015). *Sharing Cities: A Case for Truly Smart and Sustainable Cities* MIT Press. ISBN 9780262029728.
- Peris-Ortiz, Marta; Bennett, Dag R.; Yábar, Diana Pérez-Bustamante (2016). *Sustainable Smart Cities: Creating Spaces for Technological, Social and Business Development*. Springer. ISBN 9783319408958.

- Reynolds, George (2009), *Ethics in Information Technology*, Cengage Learning, ISBN 978-0-538-74622-9
- Silberschatz, Abraham (2010). *Database System Concepts* McGraw-Hill Higher Education. ISBN 978-0-07-741800-7
- Wagginton, M., Harris, J (2002) *Intelligent Skins*, Reed Elsevier, Oxford
- Wang, S. (2010) *Intelligent Buildings and Building Automation*, Spon Press, USA, ISBN10:0-415-47570-8

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related



## Syllabus - Sixth Semester

	<b>ARCHITECTURAL DESIGN – VI</b> <b>(ARC2601)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	1	4	2	8
Pre-requisites/Exposure	Architectural Design – V					
Co-requisites	Structure – VI					

### **Catalog Description**

The aim of this course is to make students familiar with the characteristics of site and the importance of site planning which includes built form and open space and context. This course will introduce methods of site analysis and research, new generative drawing techniques as well as architectural and disciplinary conventions associated with site work.

Design-problem may focus but not limited to a multi-functional, service (advanced services) oriented building like convention hall, shopping complex, resort, habitat centre, office building, mixed use occupancy buildings etc. in an urban setting including application of urban development, controls, codes and bye-laws.

### ***Design Exercise: Mixed-use Building***

#### **Course Objectives**

The objective of this course is

- To create an awareness with regard to the design of green buildings and sustainable architecture.
- To inculcate the importance of services integration and construction in spatial planning in the context of design of High-rise buildings and service intensive buildings.
- To highlight on the importance of High rise buildings as elements of identity in urban areas and urban design principles that govern their design.
- To explore computer aided presentation techniques involving 2D and 3D drawings, walk through and models as required.

## Course Outcomes

On completion of this course, the students will be able to

**CO1:** Design a Project involving multiple space utilization like a multi-functional, service (advanced services) oriented building like convention hall, shopping complex, resort, habitat centre, office building, mixed use occupancy buildings etc.

**CO2:** Build with precision block models, study models, site models

**CO3:** Demonstrates architectural and composite structural system and services.

**CO4:** Communicate through drawings or models.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction</b> Design problem may be introduced, students may visit site for collecting context specific data for getting better understanding of real-life project details. The collected data may be analysed and presented for evaluation.	L4, L5, L6	30
<b>MODULE 2: Development of Concept</b> Flow diagram to explore relation of various spaces, bubble diagram for locating various zones on site, re-create for analysing spaces in all dimensions through block models and single line graphics and study models for choosing the right option.	L4, L5, L6	42
<b>MODULE 3: Design Development</b> Integrate the knowledge gained from previous theory based subjects like Building services, Building materials and Construction Technology, Structure, etc., and apply to detail out their design proposal.	L4, L5, L6	30
<b>MODULE 4: Final Design Proposal</b> The final design proposal is prepared after conducting various informal and formal reviews at individual and at group level. The drawing and detail physical model explaining the approach and consideration of urban setting to achieve the requirements with various other restrictions may be submittals.	L4, L5, L6	42

\**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

## Text Books:

- Chiara, J. D., & Callender, J. (1983). *Time-Saver Standards for Building Types* Fourth Edition. McGraw-Hill International Edition.
- Francis D.K. Ching (1979), *Architecture: Form, Space and Order*, John Wiley & Sons Publication.

- Givoni, B. (2004). *Time Saver Standards for Urban Design: Urban Design and Climate*. Digital Engineering Library @ McGraw-Hill.
- USACE. (1997). *Human Behavior and the Interior Environment*. In Design Guide for Interiors.

### References:

- Béjar, R., Latre, M. Á., Nogueras-Iso, J., Muro-Medrano, P. R., & Zarazaga-Soria, F. J. (2009). *An architectural style for spatial data infrastructures*. International Journal of Geographical Information Science, 23(3), 271–294. <https://doi.org/10.1080/13658810801905282>
- Head, A. J. (2017). *Planning and Designing Academic Library Learning Spaces: Expert Perspectives of Architects, Librarians, and Library Consultants*. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.2885471>.
- Wolfenden, A., & Chusid, M. (1991). *Time-Saver Standards for Building Types: 3rd Edition*. Journal of Testing and Evaluation, 19(4), 347. <https://doi.org/10.1520/jte12583j>

### Modes of Evaluation: Literature Study/ Case Study/ Presentation/ Written Examination

#### Examination Scheme

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	00	50	50	100	8	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	3	--	--	1	--	--	--	--	--	1	2	3	--
CO2	2	2	1	3	--	--	1	--	--	--	--	--	1	2	3	--
CO3	2	2	2	-	-	-	2	-	-	--	-	-	1	2	-	2
CO4	2	2	1	-	-	-	3	-	-	-	-	-	1	1	-	-

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY – VI (ARC2602)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	2	2	5
Pre-requisites/Exposure	Building Materials And Construction Technology –V					
Co-requisites	Architectural Services – III					

### **Catalog Description**

The aim of this course is to familiarize students with steel structures for the construction of steel columns, beams, trusses etc. It also aims to make students aware of the construction fundamentals to construct steel framed structures and its applications. The studies proceed with sensitizing students about the construction details of the contemporary / modern methods of constructing factory sheds/ large span structures, etc with modern materials and technologies. This course also talks about alternative building materials used in construction of building. The course covers introduction of steel structures such as design of columns, beams and foundations.

### **Course Objectives**

The objective of this course is

- To introduce different alternative building materials.
- To introduce the concepts of designing with steel structures and its components.
- To elucidate the role of steel ropes/strands in pre-stressing in concrete members.
- To enable students to understand and design components such as staircases with steel structural members.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Explain different building material others than the regular one.

**CO2:** Analyze the components of roof structure.

**CO3:** Explain the alternatives of long span structures in steel.

**CO4:** Compare the various types of steel roofing systems.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Alternative Building materials</b> Different types alternative Building materials like Fly ash bricks, Concrete blocks, Mud construction, energy efficient materials, etc.	L1, L2, L3	15
<b>MODULE 2: Steel Structures</b> Construction of steel structures, Details of Roof and roof trusses , Water proofing and rain water disposal from roofs, Steel columns, portal frames, etc., North light truss, tubular monitor roof truss	L1, L2, L3	20
<b>MODULE 3: Modern Factory Shed/ Large Span Construction</b> Introduction to a wide range of modern building construction systems incorporating the use of metals like steel, aluminum and composite materials. Introduction to modern materials for roof covering, supporting structures.	L1, L2, L3, L4	10
<b>MODULE 4: Multi Storied Steel Framed Structures</b> Introduction to Multi- storied steel frame structures connections and their components, Steel Monitor Trusses, Space Frames	L1, L2, L3, L4	15

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Barry. R. (1996). Construction of Buildings, John Wiley and Sons Ltd
- Khanna P.N. (2001). Civil Engineering Handbook, Delhi: Engineers' Publishers
- Khurmi R. S. (2015). Strength of Materials (Mechanics of Solids), S.Chand Publications.
- Mackay J.K. Vol. 1-4 (2014). Building Construction, Delhi, Persons Publications
- Mitchell G.A.(1959)Elementary Building Construction, HarperCollins Distribution Services

### Reference Books

- Venkatarama Reddy, B. V. (2004, October 10). Sustainable building technologies. Current Science.
- Yang, L., & Shi, J. J. (2010). Experimental study on the impact of rainfall on RCC construction. Journal of Construction Engineering and Management, 136(5), 477–483. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0000156](https://doi.org/10.1061/(ASCE)CO.1943-7862.0000156)

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme							Total marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment					
CT	TA	A	Total	ESE	ESJ	Total			

<b>I</b>	<b>II</b>										
10	10	25	5	50	0	50	50	100	5	0	

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	--	-	--	2	1	--	--	1	--	--	--	--	2	1	--	3
<b>CO2</b>	--	-	--	2	1	--	--	2	--	--	--	--	2	1	--	3
<b>CO3</b>	--	-	--	1	2	--	--	2	--	--	--	--	2	1	--	--
<b>CO4</b>	--	-	--	2	1	--	--	3	--	--	--	--	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>STRUCTURE - VI (ARC2609)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Structure – V					
Co-requisites	Building Materials & Construction Technology – VI					

### **Catalog Description**

The aim of this course is to enable students to design simple RCC structures and their basic components viz, columns, beams, slabs and staircases. This course will help student to understand RCC structures and its application in consecutive design project. The course covers limit state method and working stress method, partial safety factor, stress and strain relationship for concrete and steel, design of simply reinforced L&T beams, RCC columns and beams, foundation and footings.

### **Course Objectives**

The objective of this course is

- To understand the analysis of intermediate structures and their use in field in greater depth.
- To design simple elevated water tanks
- To understand the application of RCC structure in consecutive design project.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Describe Three Moment theorem and their application in fixed and continuous beams.

**CO2:** Analyze the structural geometry based on strength and stability criteria.

**CO3:** Design the effective use of structural systems for complex architectural need.

**CO4:** Design the effective use of Truss structure for residential and commercial purpose.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Theory of Beams and Frames</b> Continuous beams, curved beams, portal frames, multistory building frames.	L1, L2	09
<b>MODULE 2: Elevated Water Tanks</b> Introduction of Tanks, Conical or Funnel Shaped Tanks.	L1, L2	09
<b>MODULE 3: Shells and Floors</b> Shells, Hyperbolic, Parabolic, Folded Plates, Grid or Coffered Floors, Girders.	L1, L2	09
<b>MODULE 4: Truss</b> Design principles of Truss Roof, Truss for Residential use, Truss for commercial use, Truss for long span structure like Railway shed, hanger etc.	L1, L2	09

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation

### Text Books

- Arya, C. (2009). Eurocode 3: Design of steel structures. In Design of Structural Elements (pp. 375–433). CRC Press. <https://doi.org/10.1201/b18121-13>
- Emmitt, S., & Gorse, C. (2014). Barry's Advanced Construction Of Buildings Third edition. John Wiley & Sons, Ltd (Vol. 28, p. 581).
- Salvadori, M., & Heller, R. (1986). Structure In Architecture: The Building Of Buildings, Third Edition. Struct in Archit, The Build of Build, Third Ed. Prentice-Hall Inc.

### References

- Oppermann, R. H. (1941). Strength of materials, part I, elementary theory and problems. Journal of the Franklin Institute, 231(1), 96. [https://doi.org/10.1016/s00160032\(41\)90378-](https://doi.org/10.1016/s00160032(41)90378-)
- Von Glasersfeld, E. (2009). A model for the construction of elementary concepts (pp. 45– 50). AIP Publishing. <https://doi.org/10.1063/1.58258>

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment					
CT		TA	A	Total	ESE	ESJ			
I	II								



10	10	25	5	50	50	0	50	100	3	3
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CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	2	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
<b>CO2</b>	2	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
<b>CO3</b>	2	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--
<b>CO4</b>	2	--	--	1	--	--	--	1	--	--	--	2	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SITE PLANNING AND LANDSCAPE (ARC2617)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Architectural Design - IV					
Co-requisites	Architectural Services - III					

### Catalog Description

The aim of this course is to make the students understand the role of landscape architecture in the creation of better environments. This course shall have a direct application in the design studio of the same semester as well as in the Thesis. The course covers basic introduction to landscape architecture, landscape graphics, planting design. This course will help students to understand the concepts of landscape architecture and to study and analyze site in relation to landscape design and be able to design and detail various architectural and planning landscape projects.

### Course Objectives

The objective of this course is

- To understand various types of Landscape and the role of natural and manmade landscape for Land Development;
- To provide different methods for site planning at regional and micro level;
- To understand landscape design as an allied field of architecture and planning;
- To understand process of landscape design for small and large areas.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the role and scope of Landscape architect.

**CO2:** Identify the development processes and cycles in the urban landscapes.

**CO3:** Conduct a landscape analysis and evaluate it with required functions.

**CO4:** Develop a site plan with landscape design and relate with environment and ecology.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Elements and History of Landscape</b> Study of Landscape elements such as land, vegetation, water, earth & climate, Natural & manmade elements, etc. Principles of landscape design such as unity, simplicity, variety, balance, proportion, sequence, etc. Social and economic	L1, L2, L3	9

<p>factors. Psychological considerations of spaces and enclosures. History of Landscape Architecture including natural &amp; cultural factors of the place, development of landscape architecture through history in different parts of the world such as China, Japan, Europe, Italy, France, England, Persia, Egypt, Greece, Rome. Study of landscape architecture in Medieval period in India such as Mughal. Modern &amp; Contemporary Landscape architecture. Cultural aspects of the landscape architecture with contextual understanding.</p>		
<p><b>MODULE 2: Hardscapes, Softscapes and Urban Landscape</b>  Hardscapes - pergolas, garden furniture, fences, rocks, masonry, paving &amp; surfacing, roads &amp; parking lots, walks &amp; plazas; Softscapes such as plantation, turfing, water features. Design criteria for landscape design such as visual, functional, micro-climatic, ecological and aesthetic. Basic horticultural idea about plants, plant selection, planting design and care of plants; Urban Landscape - Characteristics and components of open space patterns in towns and cities (traditional and contemporary) basic types: streets, squares, plazas, gardens, ghats and maidans, public parks at district, local and neighbourhood levels; park systems; landscape design related to land-use, circulation networks and activity; street furniture as a component of urban landscape.</p>	L1, L2, L3	9
<p><b>MODULE 3: Landscape Design and Services</b>  Macro and micro-climatic considerations in landscape architecture. Effect of climate on landscape and various components of landscape on the microclimate. Landscape Services &amp; Sustainability:  Introduction; Outdoors lighting, surface water drainage, irrigation, soil management techniques.</p>	L1, L2, L3	9
<p><b>MODULE 4: Landscape Aspects of Site Planning</b>  Principles of understanding and evaluating and existing landscape; development as a response to constraints and opportunities offered by the site; the landscape concept and open space structure as a basic component of the site plan; The role of vegetation: environmental benefits, functional requirements, aesthetic considerations; typical situations and criteria for design with plants and selection of species; grading; in relation to existing contours, plinth levels, road alignment and storm water drainage; principles of cut and fill.</p>	L1, L2, L3	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Marsh, M. William, (2010). *Landscape Planning Environmental Applications*;
- Booth, Norman K., *Basic Elements of Landscape Architectural Design*;
- J.O. Symonds, *Landscape Architecture*;
- J.O. Symonds, *Architecture-A manual of site planning and design*;
- John I. Motloch, *Introduction to Landscape Design*;
- J. E. Ingels, *Landscaping – Principles and Practice*;
- Walker and Theodore, *Planting Design*

## Reference Books

- J.O. Symonds, Earthscape; *Theory in Landscape Architecture: A Reader* (Penn Studies in Landscape Architecture);
- Landscape as Urbanism: A General Theory by Charles Waldheim;
- Cliff Tandy, Handbook of Urban Landscape; M. Bring, Japanese Gardens: Design & Meaning
- Conan, M., & Conan, M. (2000). *Environmentalism in landscape architecture. Library* (Vol. 22). Retrieved from [http://books.google.com/books?hl=en&lr=&id=wr385lQxrbsC&oi=fnd&pg=PA1&dq=Environmentalism+in+landscape+architecture&ots=hMCOKluPkW&sig=iFCLKXFB\\_aH6CX6q1w26O1Aj4PU](http://books.google.com/books?hl=en&lr=&id=wr385lQxrbsC&oi=fnd&pg=PA1&dq=Environmentalism+in+landscape+architecture&ots=hMCOKluPkW&sig=iFCLKXFB_aH6CX6q1w26O1Aj4PU)
- Laurie, M. (1986). An introduction to landscape architecture. Second edition. *An Introduction to Landscape Architecture. Second Edition.*
- Vernon, S. (2013). *Landscape Architect's Pocket Book. Landscape Architect's Pocket Book.* Routledge. <https://doi.org/10.4324/9780203568705>
- Starke, B. (2016). *Landscape Architecture: A Manual of Environmental Planning and Design.* McGraw Hill (Vol. 86, pp. v-vi). McGraw-Hill Education. <https://doi.org/10.1080/02681307.2016.1252112>
- Clayden, A., & Osmundson, T. (2001). Roof Gardens: History Design and Construction. *Garden History*, 29(2), 226. <https://doi.org/10.2307/1587387>
- Thacker, C., & Keswick, M. (1979). The Chinese Garden: History, Art and Architecture. *Garden History*, 7(1), 20. <https://doi.org/10.2307/1586713>
- Smith, L. S., & Fellowes, M. D. E. (2013, July 1). Towards a lawn without grass: The journey of the imperfect lawn and its analogues. *Studies in the History of Gardens and Designed Landscapes.* <https://doi.org/10.1080/14601176.2013.799314>
- Mannion, A. M. (1999). Modern trends in ecology and environment, R.S. Ambasht (1998) - Book review. *Journal of Ecology*, 87(1), 176.

## Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT	TA	A	Total	ESE	ESJ	Total				
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	--	--	1	--	--	--	--	--	2	--	1	2	--	--
CO2	2	2	--	--	1	--	--	--	--	--	2	--	1	2	--	--
CO3	2	2	--	--	1	--	--	--	--	--	2	--	1	3	--	--
CO4	2	2	--	--	1	--	--	--	--	--	2	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>THEORY OF ARCHITECTURE – II</b> <b>(ARC2618)</b>	L	T	S	P	C
Version 1.1	Date of approval:	2	0	0	0	2
Pre-requisites/Exposure	Theory of Architecture - II					
Co-requisites	Architectural Design - VI					

### Catalog Description

The aim of the course will be on understanding the main theoretical concepts in vernacular architecture. Key theoretical paradigms, methodologies and modes of enquiries will be introduced. Ability to comprehend some of the main theoretical moorings of 20th and 21st century in architecture, analyze built works and critically examine the ideas and view of practice they represent as a precursor to shaping one's own design approach.

### Course Objectives

The objective of this course is

- To acquaint students with knowledge of Vernacular Architecture.
- To understand the development of Architecture with time.
- To introduce the different theories prevalent related to Architectural Design.
- To equip the students with their own Design Philosophy.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain basic architectural features of Vernacular Architecture.

**CO2:** Apply the knowledge of demand and supply in profession as per need.

**CO3:** Apply the architecture theories in Architecture Design.

**CO4:** Develop their own Design Philosophy

Modules	Blooms level*	Number of hours
<b>MODULE 1: Vernacular Architecture</b> Vernacular architecture including primitive or aboriginal architecture; indigenous architecture; ancestral or traditional architecture; folk, popular, or rural architecture;	L1, L2	6

<b>MODULE 2: Architecture Growth</b> Understanding the Need, demand and supply in different periods by various great designers.	L1, L2	6
<b>MODULE 3: Architecture Theories</b> Theory and criticism, theories in relation to practice, writing and theory as design tools in professional practice.	L1, L2,L4	6
<b>MODULE 4: Architecture Philosophy</b> Theory as a basis of the student's personal philosophy as an architect	L1, L3, L4	6

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text/Reference Books

- A.B. Gallion (1986), *Ubrban Pattern: City Planning and Design*, Van Nostrand Reinhold; Subsequent
- Sir Bannister Fletcher. (1896), *The History of Architecture*, Oxford, Boston, Architectural Press
- Van De Ven, F. H. M., Nelen, A. J. M., & Geldof, G. D. (1992). *Urban drainage. In Drainage Design* (pp. 118–150). Springer US.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ				Total
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	-	1	--	--	1	2	1	--	--	-	3	-	-	1	2
CO2	1	-	1	--	--	1	2	1	-	--	-	3	-	-	1	2
CO3	1	-	1	--	--	1	2	1	-	--	-	3	-	-	1	2
CO4	1		1									3				2

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING SERVICES – IV (ARC2619)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Building Materials And Construction Technology –IV, Architectural Services- II					
Co-requisites	Architectural Design – V					

### Catalog Description

The aim of this course is to give architect an overview and introduction to escalators, lifts, mechanized parking. This course also covers about security surveillance systems of building using cameras. The course covers Elevators, lift, escalators, mechanized parking system, Mechanical ventilation system and security surveillance model.

### Course Objectives

The objective of this course is

- To discuss the working of escalators and lifts including location and criteria for their design.
- To develop an understanding of the advanced building services and their application in the design proposals of buildings of slight complex nature such as multistoried.
- To understand the principles and techniques related to mechanized parking and mechanized ventilation.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Comprehend the various modes of vertical circulation through live examples

**CO2:** Develop understanding for techniques and systems for Security and surveillance.

**CO3:** Apply principles of mechanized parking

**CO4:** Discuss the importance of ventilation systems in buildings.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Lifts and Escalators</b> Basic Principles of Elevators working, definitions, NBC's recommendations, location and service, Method of working, various shapes and sizes available,	L1, L2, L3, L4	8



sketches – plans, sections, elevations of different types of lifts including construction and installation details. Basic Principles of Escalator working, definitions, NBC’s recommendations, location and service, Method of working, various shapes and sizes available, sketches – plans, sections, elevations of different types of escalators including construction and installation details.		
<b>MODULE 2: Security and Surveillance</b> Perimeter Protection - Barriers, Doors, Gates, Turnstiles and Fences. Intrusion Detection Sensors and Systems - Outdoor & Indoor. Introduction to Access Control Systems, Locks & Emergency Exits. Visitor Management Systems. Identification Systems – PIN, Card, Wireless systems and Biometric system. Security Lighting, Illumination including Infra-red. Understanding CCTV cameras - Pan, Tilt & Zoom mechanisms. Recording Systems – Digital and Analog Recording. Components of Basic systems.	L1, L2, L3, L4	8
<b>MODULE 3: Mechanical Parking</b> Basic Principles of Mechanized Parking system working, definitions, NBC’s recommendations, location and service, Method of working, various shapes and sizes available, sketches of different types of parking	L1, L2, L3, L4	4
<b>MODULE 4: Mechanical Ventilation</b> Standard requirements of ventilation for different conditions of living and works. Conditions for comfort. Control of quality, quantity, temperature and humidity of air.	L1, L2, L3, L4	4

*\*Bloom’s Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- The CIBSE (2000) Building Control Systems, Applications Guide (CIBSE Guide)
- Hession, A. (2001, September). Escalators. Elevator World.
- Humberg, H., Friedrich Mader, H., & Will, F. (1992). Remote diagnosis as used for mechanized parking systems. Technische Mitteilungen Krupp English Ed., (2), 85–96.
- Kinsey, M. J., Galea, E. R., & Lawrence, P. J. (2012). Human Factors Associated with the Selection of Lifts/Elevators or Stairs in Emergency and Normal Usage Conditions. Fire Technology, 48(1), 3–26. <https://doi.org/10.1007/s10694-010-0176-7>
- Understanding Building Automation Systems (Direct Digital Control, Energy Management, Life Safety, Security, Access Control, Lighting, Building Management Programs) by Reinhold A. Carlson, Robert A. Di Giandomenico.
- Building Automation: Control Devices and Applications by In Partnership with NJATC (2008).
- Building Control Systems, Applications Guide (CIBSE Guide) by The CIBSE (2000).

### References

- Anon. (1981). Safety Code for Elevators and Escalators. American National Standards Institute, Standards.

- Bangash, M. Y. H. (2007). Lifts, Elevators, Escalators and Moving Walkways/Travelators. Lifts, Elevators, Escalators and Moving Walkways/Travelators. CRC Press. <https://doi.org/10.1201/9780203020760>

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme								Total marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	2	--	--	--	--	--	--	--	--	--	2-	1	--	--
CO2	2	--	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO3	2	--	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO4	2	--	1	--	--	--	-	--	--	--	--	-	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SEMINAR (ARC2638)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Architectural Design - V					
Co-requisites	Building Material and Construction Technology-VI					

### Catalog Description

The aim of this course is to prepare students for writing a paper based on secondary research and literature review and its oral and visual presentation. Students would be able to identify and go in depth into specific and appropriate aspects relating to the discipline of architecture and discuss how it is reflected in the realm of design. Students learn how to research a subject area through readings; learn description, analysis and synthesis of readings; citation of authors in their writing. The importance of the course is also in understanding what constitutes plagiarism research writing and in imbibing the ethics of publication. Literature review is seen as the first step in preparation of understanding research methods.

### Course Objectives

The objective of this course is

- To introduce research work to the students
- To identify a specific aspect relating to the discipline of architecture.
- To make them aware of the constitutes of plagiarism.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Identify research papers published in Journals for a study.

**CO2:** Apply the projected drawing method of exterior and interior perspective.

**CO3:** Organize a study based on literature survey

**CO4:** Apply research methods in case study and Develop ethics of publication

Modules	Blooms level*	Number of hours
<b>MODULE 1: Foundations of Research</b> Meaning, Objectives, Motivation, Utility of research. – Understanding the language of research – Concept, Construct, Definition, Variable. Research	L1, L2, L3	6

Process		
<b>MODULE 2: Problem Identification and Formulation</b> Research Question – Investigation Question – Measurement Issues – Hypothesis – Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis. Hypothesis Testing – Logic & Importance.	L1, L2, L3	6
<b>MODULE 3: Surveys and Sampling</b> Types of surveys in details for various types of research; Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non-Response. Characteristics of a good sample. Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Determining size of the sample – Practical considerations in sampling and sample size.	L1, L3, L4	6
<b>MODULE 4: Analysis, Interpretation of Data and Paper Writing</b> Univariate analysis (frequency tables, bar charts, pie charts, percentages); Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish. Ethical issues related to publishing, Plagiarism and Self-Plagiarism.	L1, L2, L3	6

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Kothari, C.R. (1985). *Research Methodology*, Delhi: New Delhi International Publishers

### Reference Books

- Sagar ,Linkan (2019). *3D Max 2019 Training Guide*, New Delhi: BPB Publication
- Sagar ,Linkan, (2019). *Revit 2019 Architecture Training Guide*. New Delhi: BPB Publication.
- Lorraine Farrelly Nicola Crowson. (2014). *Representational Techniques for Architecture (Basics Architecture)*. (2nd Revised edition). Bloombury.
- M.C. Trivedi. (2009). *Computer Graphics & Animation*. (First edition). Jaico Publishing House.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

### Examination Scheme:

Evaluation Scheme						Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment				
CT		TA	A	Total	ESE			
I	II							

10	10	75	5	100	0	0	0	100	2	0
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CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	1	3	2	--	--	--	--	--	--	--	--	1	3	--	3
CO2	--	2	2	3	--	--	--	--	--	--	--	--	1	2	--	2
CO3	--	2	1	3	--	--	--	--	--	--	--	--	1	2	--	2
CO4	--	3	2	2	--	--	--	--	--	--	--	--	2	2	--	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE- PEOPLE CULTURE AND BUILT ENVIRONMENT- II (ARC2620)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	History of Architecture, Architectural Design – III					
Co-requisites	Theory of Architecture					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in psychological and sociological aspects which are of concern to Architecture. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide students the exposure to understanding society and various built forms produced by society. The course will also provide the students hands-on cultural, sociological and psychological studies of the built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross fertilization with other courses. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on projects. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To understand the basic principles of psychology, sociology and culture of settlement.
- The course intends to study and understand the typical components of city in order to appreciate how these elements contribute to the quality of life of urban communities.
- To familiarize students with decisive strategies that brings inclusivity and equality in the designs of built forms.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Develop a relationship between man and his larger social environment, with special emphasis on aspects that are likely to affect intervention in or creation of, the built environment (predominantly urban)

**CO2:** Develop a language and vocabulary for discussions/ analysis on the sociological/ psychological dimensions of architecture.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Psychology, Sociology and Built Environment</b>            Basic introduction to various critical social aspects; Role of psychology in architecture; Role of sociology in built environment; Determinants of sociology- social structure, social status, social control, social institutions, social mobility; Inclusive Built Environment; Barrier free designs and built environments;            Various case studies related to gender and architecture, community development- community response towards development strategy etc.</p>	L1, L2	8
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	16

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books/References**

- Cragun R.T.(2006). Introduction to Sociology, Wikibooks.
- Giddens, A (2006) Sociology, Polity Press, Cambridge (UK)
- Lynch, K. (1960) The Image of the City, Joint Centre Publication, USA
- Oomen T.K. and Venugopal C.N. (2004), Sociology, Eastern Book Company.
- Porteous, Douglas, J. (1977), Environment Behaviour: Planning and Everyday Urban Life, Addison Wesley
- Sinha A. (2013) “An India for Everyone: A Path of Inclusive Development, Harpercollins
- Steve Barkan (2010), Sociology: Understanding and Changing the Social World, Flat World Reference Books
- Tejchman A. (2016) “The Politics of Inclusive Development”, Palgrave Macmillan.

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related



	<b>ELECTIVE- ECOLOGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT – II (ARC2621)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Environmental Sciences, Building Services-1, Building Services-2					
Co-requisites	Architectural Design, Building Services-3					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in ecology, environment and sustainable aspects which are of concern to Architecture. The course will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide students the exposure to understanding ecology and various environmental problems faced by settlements. The course will also provide the students hands-on ecological and environmental studies of built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross learning with other courses. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on projects. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To understand the basic principles of ecology, environment and sustainable development.
- The course intends to study and understand the different components of city in order to understand how these elements contribute to environment quality.
- To establish the significance of the ecological issues, their impact and initiatives to address the same in the built environs to achieve sustainable development.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

- CO1:** Develop a relationship between man and ecology, will

understand critical environmental issues and need to address the m by using advanced technology.

**CO2:** Produce reports and presentation.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Ecology, Environment and Sustainable Development</b>            Basic introduction to ecology; Interrelation between natural and built environment; Importance of environment sustainability in built environment; Energy conservation, renewable sources: wind, solar, geo-thermal, bio-fuels; Materials minimizing, recycling, reducing energy content, etc; Other environmental issues related to solid waste management, water resources, air quality, storm water drainage etc; Various case studies related to traditional / vernacular buildings and settlements demonstrating relationship between climate, local material resources and settlement/ building forms.</p>	L1, L2	8
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	16

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books/References**

- Bakari, Mohamed El-Kamel (2017). The Dilemma of Sustainability in the Age of Globalization: A Quest for a Paradigm of Development. New York: Lexington Books. ISBN 978-1498551397
- Blewitt, J. (2008). Understanding Sustainable Development. London: Earthscan. pp. 21–24. ISBN 978-1-84407-454-9.
- Fulekar, M. H., Pathak, B., Kale, R. K. (2014) Environment and Sustainable Development' Springer Nature; ISBN-10: 8132211650; ISBN-13: 978-8132211655
- Goudie, Andrew (2000). The Human Impact on the Natural Environment. Cambridge, Massachusetts: This MIT Press. pp. 203–239. ISBN 0-262-57138-2.

- James, Paul (2014). *Urban Sustainability in Theory and Practice*. doi:10.4324/9781315765747. ISBN 978-1-315-76574-7.
- James, Paul; Magee, Liam (2016). "Domains of Sustainability". In A. Farazmand (ed.). *Global Encyclopedia of Public Administration, Public Policy, and Governance*. Springer.
- Modak, P. (2017) *Environmental Management Towards Sustainability*, CRC Press, ISBN-10: 9781498796248
- Odum, E. P. (1971). *Fundamentals of Ecology (Third ed.)*. New York: Saunders. ISBN 0-7216-6941-7.
- Porteous, Douglas, J. (1977), *Environment Behaviour: Planning and Everyday Urban Life*, Addison Wesley
- Thangavel, P., Sridevi, G. (2015) *Environmental Sustainability*, Springer Nature, ISBN-10: 9788132220558
- Walker, Brian and Salt, David (2006) *Resilience Thinking: Sustaining ecosystems and people in a changing world*. Island Press. p. xiii. ISBN 978-1597260930.
- Wandenberg, JC (August 2015). *Sustainable by Design*. Amazon. p. 122. ISBN 978-1516901784

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE - COMPUTER APPLICATIONS AND ADVANCE TECHNOLOGIES – II (ARC2622)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Architectural Graphic Skills					
Co-requisites	Architectural Design, Building Materials and Construction Technology					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in computer applications and advance technologies which are of concern to Architecture. The course will generally be conducted in the tutorial mode to encourage exploration and skill developments. The aim of this course is to provide students the exposure to understanding new technological innovations and their applications in field of architecture. The course will also provide the students hands-on experience of new software and applications. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross learning with other courses. The course would be conducted through data base creation, analysis, presentation. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To familiarize students with use of computers in architecture and with impact of Information Technology on architectural knowledge system and practice.
- To critically explore current advancements in smart technologies available for sustainable built environments.
- To sensitize students about strategies for innovations by using latest technologies.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Students will be exposed to the latest software and computer applications available in the field of architecture.

**CO2:** Students will be aware of new advanced technologies available for architecture.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to computer applications and advance technologies</b></p> <p>Basic introduction to information technology in architecture; Introduction to smart technologies in field of architecture; Applications of information technology in architecture; applications of smart technologies in architecture;</p> <p>Case studies related to use of information technology and advance technology in architecture and built environment. .</p>	L1, L2	9
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of project; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L3, L4, L5, L6	18

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books/References

- Ching, F. D. (2009) Architectural Graphics, John Wiley and Sons
- D'Ulizia, A., Ferri, F., Grifoni, P., & Guzzo, T. (2010). Smart homes to support elderly people: innovative technologies and social impacts. In *Pervasive and Smart Technologies for Healthcare: Ubiquitous Methodologies and Tools* (pp. 25-38). IGI Global.
- Deakin, Mark; Al Waer, Husam (2011). "From Intelligent to Smart Cities". *Journal of Intelligent Buildings International: From Intelligent Cities to Smart Cities*. **3** (3): 140–152.
- Graham, S.; Marvin, S. (1996). *Telecommunications and the city: electronic spaces, urban place*. London: Routledge. ISBN 9780203430453.
- Kedar, Seema (2009). *Database Management System* Technical Publications. ISBN 9788184316049.
- Komninos, Nicos (22 August 2013). "What makes cities intelligent?". In Deakin, Mark (ed.). *Smart Cities: Governing, Modelling and Analysing the Transition*. Taylor and Francis. p. 77. ISBN 978-1135124144
- McLaren, Duncan; Agyeman, Julian (2015). *Sharing Cities: A Case for Truly Smart and Sustainable Cities* MIT Press. ISBN 9780262029728.
- Peris-Ortiz, Marta; Bennett, Dag R.; Yábar, Diana Pérez-Bustamante (2016). *Sustainable Smart Cities: Creating Spaces for Technological, Social and Business Development*. Springer. ISBN 9783319408958.

- Reynolds, George (2009), *Ethics in Information Technology*, Cengage Learning, ISBN 978-0-538-74622-9
- Silberschatz, Abraham (2010). *Database System Concepts* McGraw-Hill Higher Education. ISBN 978-0-07-741800-7
- Wagginton, M., Harris, J (2002) *Intelligent Skins*, Reed Elsevier, Oxford
- Wang, S. (2010) *Intelligent Buildings and Building Automation*, Spon Press, USA, ISBN10:0-415-47570-8

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Seventh Semester

	<b>ARCHITECTURAL DESIGN - VII (ARC2701)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	1	4	2	8
Pre-requisites/Exposure	Building Materials & Construction Technology – VII					
Co-requisites	Advanced Building Services					

### **Catalog Description**

The aim of the course is to emphasize on creative and rational skills for problem solving in architectural buildings on real site. Design-problem may focus on multifunctional, multi storied structure and services with application at site and building level like multi star hotels, multi specialist hospitals, high rise mall etc. in an urban setting including application of urban development controls, codes and bye-laws. The design proposal will be taken up with byelaws, master plan or any other restriction on large site.

### ***Design Exercise: Housing***

### **Course Objectives:**

The objective of this course is

- To create an awareness with regard to the design of green buildings and sustainable architecture.
- Integration of structures into design development.
- To inculcate the Complex services integration and construction.
- To integration of technology to make the building intelligent and secured.

## Course Outcomes:

On completion of this course, the students will be able to

**CO1:** Design a Project involving multiple space utilization like 5 Star Hotel, Multi-specialty hospital.

**CO2:** Build with precision block models, study models, site models

**CO3:** Demonstrates architectural and composite structural system and services.

**CO4:** Communicate through drawings or models.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction</b> Design problem may be introduced, students may visit site for collecting context specific data for getting better understanding of real-life project details. The collected data may be analysed and presented for evaluation.	L4, L5, L6	30
<b>MODULE 2: Development of Concept</b> Flow diagram to explore relation of various spaces, bubble diagram for locating various zones on site, re-create for analysing spaces in all dimensions through block models and single line graphics and study models for choosing the right option.	L4, L5, L6	42
<b>MODULE 3: Design Development</b> Integrate the knowledge gained from previous theory based subjects like Building services, Building materials and Construction Technology, Structure, etc., and apply to detail out their design proposal.	L4, L5, L6	30
<b>MODULE 4: Final Design Proposal</b> The final design proposal is prepared after conducting various informal and formal reviews at individual and at group level. The drawing and detail physical model explaining the approach and consideration of urban setting to achieve the requirements with various other restrictions may be submittals.	L4, L5, L6	42

\**Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5:Synthesis, L6:Evaluation*

## References:

- Filippín, C., & Larsen, S. F. (2009). Energy efficiency in buildings. In *Energy Efficiency Research* (pp. 153–166). Nova Science Publishers, Inc.
- Fischer, J. R., & Finnell, J. A. (2007). Energy and buildings. *Resource: Engineering and Technology for Sustainable World*, 14(3), 8–9



- Grenier, D., Kaae, B. C., Miller, M. L., & Mobley, R. W. (1993). Ecotourism, landscape architecture and urban planning. *Landscape and Urban Planning*, 25(1–2), 1–16. [https://doi.org/10.1016/0169-2046\(93\)90119-X](https://doi.org/10.1016/0169-2046(93)90119-X)
- Hamula, W., Hamula, D. W., & Dwyer, F. (1997). Site planning. *Journal of Clinical Orthodontics : JCO*, 31(1), 47–53.
- Huseynov, E. F. O. (2011). Planning of sustainable cities in view of green architecture. In *Procedia Engineering* (Vol. 21, pp. 534–542). Elsevier Ltd. <https://doi.org/10.1016/j.proeng.2011.11.2048>
- Leyzerova, A., Sharovarova, E., & Alekhin, V. (2016). Sustainable Strategies of Urban Planning. In *Procedia Engineering* (Vol. 150, pp. 2055–2061). Elsevier Ltd. <https://doi.org/10.1016/j.proeng.2016.07.299>
- Lynch, K. (1960). The city image and its elements. *The Image of the City*, 46–90. <https://doi.org/10.1525/sp.1960.8.3.03a00190>
- Manzano-Agugliaro, F., Montoya, F. G., Sabio-Ortega, A., & García-Cruz, A. (2015, May 22). Review of bioclimatic architecture strategies for achieving thermal comfort. *Renewable and Sustainable Energy Reviews*. Elsevier Ltd. <https://doi.org/10.1016/j.rser.2015.04.095>
- Pacheco, R., Ordóñez, J., & Martínez, G. (2012, August). Energy efficient design of building: A review. *Renewable and Sustainable Energy Reviews*. <https://doi.org/10.1016/j.rser.2012.03.045>
- Williams, D. E. (2007). Sustainable design: Ecology, architecture, and planning. *A Wiley Book on Sustainable Design*. Retrieved from <http://www.loc.gov/catdir/toc/ecip077/2006102173.html>

### Modes of Evaluation: Case Study/ Site Visit/ Portfolio Submission:

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	8	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	3	-	-	-	-	-	-	-	-	1	2	-	-

<b>CO2</b>																
<b>CO3</b>																
<b>CO4</b>																

1: strongly related, 2: moderately related and 3: weakly related

	<b>BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY – VII (ARC2702)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	2	2	5
Pre-requisites/Exposure	Building Materials And Construction Technology –VI					
Co-requisites	Architectural Services – III, Architectural Design – VII					

### **Catalog Description**

The aim of this course is to make students aware of the requirement of drawings at the site for the execution of the construction work. The Design of a building prepared needs to be executed and constructed on the site. The building drawings so prepared become part of the contract documents with proper labeling and dimensioning, specifications, detailing. The drawings shall be based on building design prepared as design studio assignment in the previous semester. The learning of building material and construction will be implemented for preparing various drawings through the semester.

### **Course Objectives**

The objective of this course is

- To train the students to prepare detailed Working drawings for effective execution at construction site
- To integrate all services and structure system in the working drawing project.
- To understand the value of detailing for various types of drawings and methods of transmittals and record keeping.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Demonstrate the preparation of execution drawings in the process of realization of a designed building.

**CO2:** Select the appropriate construction details as per the various services.

**CO3:** Interpret and translate drawings based on the structural and other practical considerations.

**CO4:** Integrate all the drawings prepare for the execution purpose.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Architectural working drawing</b>            Making complete set of submission drawing for the residence or any other project complying all the local building byw-laws and NBC.</p> <p>Making complete set of working drawings for the residence or any other project designed by the student. The drawings to incorporate all necessary information complete with schedule and all specifications. The Working Drawings to include:</p> <ol style="list-style-type: none"> <li>1. Site plan.</li> <li>2. Foundation layout with details of foundations and DPC.</li> <li>3. Ground floor Plan.</li> <li>4. First Floor Plan.</li> <li>5. Terrace Plan</li> <li>6. Sections</li> <li>7. Elevations</li> </ol>	L3, L4, L5, L6	15
<p><b>MODULE 2: Services drawing</b>            Making complete set of services drawings for the above said project. The drawings to incorporate services details complete with schedule and all specifications. The Services Drawings to include:</p> <ol style="list-style-type: none"> <li>1. Electrical Layout.</li> <li>2. Plumbing Layout.</li> <li>3. Sanitary Layout.</li> <li>4. Drainage Layout.</li> <li>5. Rain Water Disposal / Harvesting Layout and Details.</li> <li>6. Toilet details.</li> <li>7. Kitchen / Pantry Details.</li> </ol>	L3, L4, L5, L6	15
<p><b>MODULE 3: Working details</b>            Making complete set of working details for the above said project. The drawings to incorporate details complete with schedule and all specifications. The Working Details to include:</p> <ol style="list-style-type: none"> <li>1. Doors and Windows Drawings and Details.</li> <li>2. Staircase Details including railings.</li> <li>3. Details of Grills, Parapet or railings.</li> <li>4. Typical wall section showing foundation, DPC, skirting, sill, lintel, slab and terracing details.</li> </ol>	L3, L4, L5, L6	15
<p><b>MODULE 4: Finishing Drawings</b>            Making complete set of finishing drawings for the above said project. The drawings to incorporate finishing details complete with schedule and all specifications. The Finishing Details to include:</p> <ol style="list-style-type: none"> <li>1. Doors and Windows Frame and Shutter details.</li> <li>2. Flooring &amp; Skirting pattern and fixing details.</li> <li>3. Dado / Wall tile pattern and fixing details.</li> </ol>	L3, L4, L5, L6	15

4. Wall Cladding pattern and fixing details.		
5. Plaster Pattern with Colour schemes.		

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Barry. R. (1996). Construction of Buildings, John Wiley and Sons Ltd
- Khanna P.N. (2001). Civil Engineering Handbook, Delhi: Engineers' Publishers
- Khurmi R. S. (2015). Strength of Materials (Mechanics of Solids),S.Chand Publications.
- Mackay J.K. Vol. 1-4 (2014). Building Construction, Delhi, Persons Publications
- Mitchell G.A.(1959)Elementary Building Construction, HarperCollins Distribution Services

### Reference Books

- Citherlet, S., Di Guglielmo, F., & Gay, J. B. (2000). Window and advanced glazing systems life cycle assessment. Energy and Buildings, 32(3), 225–234. [https://doi.org/10.1016/S0378-7788\(98\)00073-5](https://doi.org/10.1016/S0378-7788(98)00073-5)
- Mikosch, T., & Kallenberg, O. (1998). Foundations of Modern Probability. Journal of the American Statistical Association, 93(443), 1243. <https://doi.org/10.2307/2669881>
- Tasou, P. (2008). Trusses. In Steel Designers' Manual: The Steel Construction Institute, Sixth Edition (pp. 541–576). Blackwell Science Ltd. <https://doi.org/10.1002/9780470775097.ch19>

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme							Total marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ				Total
I	II									
10	10	25	5	50	0	50	50	100	5	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	-	2	1	--	--	--	--	--	--	--	--	--	3	1	3
CO2	--	-	2	1	--	--	--	--	--	--	--	--	--	3	1	3
CO3	--	-	2	1	--	--	--	--	--	--	--	--	--	3	1	3
CO4	--	-	2	1	--	--	--	--	--	--	--	--	--	3	1	3

1: strongly related, 2: moderately related and 3: weakly related

	<b>STRUCTURE - VII (ARC2703)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Structure – VI					
Co-requisites	Building Materials & Construction Technology – VII					

### **Catalog Description**

The aim of this course is to enable students to design simple steel structures and their basic components. The fundamental aspects of analysis and design and also discusses the practical requirements such as safety, feasibility and economy of steel structures. The subject will be taught in congruence with the Design studio, and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same.

### **Course Objectives**

The objective of this course is

- To understand the design of steel structures.
- To learn the behavior and design of structural steel components (members and connections in two - dimensional (2D) truss and frame structures)
- To gain an educational and comprehensive experience in the design of simple steel structures.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Design building structure.

CO2: Design simple connections, rivets, welds, bolts and pins.

CO3: Design column base and footing.

CO4: Design beams and gantry girders.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Design Principles</b> Introduction to Design Specification for Steel Members, Bolted Connections, Welded Connections.	L1, L2, L3	09
<b>MODULE 2: Structural Connections</b> Beam to beam connections, beam to column connection, bolted bracket connection, welded crane bracket connection.	L1, L2, L3	09
<b>MODULE 3: Shear Force and bending moment diagram, theory of yielding and failure</b> Design Of Laced Column, Battered Column, Design Of Slab Base And Gusseted Base.	L1, L2, L3	09
<b>MODULE 4: Design principles and high-rise structures</b> Laterally restrained beam, gantry girder, plate girder with -thick web plate and thin web plate. Design of steel roof truss and tubular truss.	L1, L2, L3	09

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation

### Text Books

- Arya, C. (2009). Eurocode 3: Design of steel structures. In Design of Structural Elements (pp. 375–433). CRC Press. <https://doi.org/10.1201/b18121-13>
- Coutie, M. G. (1997). Structural and stress analysis. Engineering Structures, 19(1), 92. [https://doi.org/10.1016/s0141-0296\(97\)81457-5](https://doi.org/10.1016/s0141-0296(97)81457-5)
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- Emmitt, S., & Gorse, C. (2014). Barry's Advanced Construction Of Buildings Third Edition. John Wiley & Sons, Ltd (Vol. 28, p. 581).
- Guadagnini, M. (2008, May). Mechanics of Composite Materials: Preface. Mechanics of Composite Materials, 44(3), 197–198. <https://doi.org/10.1007/s11029-008-9011-3>
- Oppermann, R. H. (1941). Strength of materials, part I, elementary theory and problems. Journal of the Franklin Institute, 231(1), 96. [https://doi.org/10.1016/s00160032\(41\)90378-2](https://doi.org/10.1016/s00160032(41)90378-2)

### References

- Baig, M. N., Fan, J., & Nie, J. (2006). Strength of concrete filled steel tubular columns. Tsinghua Science and Technology, 11(6), 657–666. [https://doi.org/10.1016/S1007-0214\(06\)70248-6](https://doi.org/10.1016/S1007-0214(06)70248-6)
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- Structural modeling and analysis. (1998). Choice Reviews Online, 35(07), 35-3890-35– 3890. <https://doi.org/10.5860/choice.35-3890>
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**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	--	--	1	3	--	--	1	--	--	--	--	3	1	--	--
CO2	--	--	--	1	3	--	--	1	--	--	--	--	3	1	--	--
CO3	--	--	--	2	3	--	--	1	--	--	--	--	2	1	--	--
CO4	--	--	--	2	3	--	--	1	--	--	--	--	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>RESEARCH METHODOLOGY (ARC2705)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Research - I					
Co-requisites	Building Material and Construction Technology-VI					

### **Catalog Description**

The aim of this course is to prepare students for writing a paper based on secondary research and literature review and its oral and visual presentation. Students would be able to identify and go in depth into specific and appropriate aspects relating to the discipline of architecture and discuss how it is reflected in the realm of design.

Students learn how to research a subject area through readings; learn description, analysis and synthesis of readings; citation of authors in their writing. The importance of the course is also in understanding what constitutes plagiarism research writing and in imbibing the ethics of publication. Literature review is seen as the first step in preparation of understanding research methods.

### **Course Objectives**

The objective of this course is

- To introduce research work to the students
- To identify a specific aspect relating to the discipline of architecture.
- To conduct a research

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Identify area of research for thesis

**CO2:** Identify a research problem, formulation of hypothesis and organize a study based on literature survey

**CO3:** Apply research methods in case study and analyze the data collected from different sources

**CO4:** Develop ethics of publication

Modules	Blooms level*	Number of hours
<b>MODULE 1: Identifying research topic, Research Gap and Project Formulation</b> Choose any topic of the interest in consultation to the faculty concern; Research Question – Investigation Question – Measurement Issues – Hypothesis – Qualities of a good Hypothesis –Null Hypothesis & Alternative Hypothesis. Hypothesis Testing – Logic & Importance.	L1, L2, L3	6
<b>MODULE 2: Literature Review</b> Review of research paper, books, journals etc related to the topic	L1, L2, L3	6
<b>MODULE 3: Surveys, Data Collection and Data Analysis</b> Questionnaire to be prepared and Surveys to be conducted related to research. Other related data to be collected from appropriate resources. Collected data to be analysed using proper software. frequency tables, bar charts, pie charts, percentages etc	L1, L2, L3, L4	6
<b>MODULE 4: Paper Writing</b> Research paper writing in appropriate format. Ethical issues related to publishing, Plagiarism and Self-Plagiarism to be checked	L1, L2, L3	6

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

#### Text Books

- Kothari, C.R. (1985). *Research Methodology*, Delhi: New Delhi International Publishers

#### Reference Books

- Sagar ,Linkan (2019). *3D Max 2019 Training Guide*, New Delhi: BPB Publication
- Sagar ,Linkan, (2019). *Revit 2019 Architecture Training Guide*. New Delhi: BPB Publication.
- Lorraine Farrelly Nicola Crowson. (2014). *Representational Techniques for Architecture (Basics Architecture)*. (2nd Revised edition). Bloombury.
- M.C. Trivedi. (2009). *Computer Graphics & Animation*. (First edition). Jaico Publishing House.

#### Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

#### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment					
CT		TA	A	Total	ESE	ESJ			
I	II								

10	10	75	5	100	0	0	0	100	2	0
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CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	1	3	2	--	--	--	--	--	--	--	--	1	3	--	3
CO2	--	2	2	3	--	--	--	--	--	--	--	--	1	2	--	2
CO3	--	2	1	3	--	--	--	--	--	--	--	--	1	2	--	2
CO4	--	3	2	2	--	--	--	--	--	--	--	--	2	2	--	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>LEED LAB – I (ARC2717)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Architectural Design- VI					
Co-requisites	Architectural Design – VII					

### Catalog Description

The aim of this course is to provide fundamental knowledge about natural and built environment. And also introduces fundamental concepts to understand environmental processes. The curriculum further incorporates understanding in relation to Indian context. Course will be interdisciplinary and flexible.

### Course Objectives

The objective of this course is

- To acquaint the student with the factors to be taken into consideration
- To understand the applications of an intelligent building.
- To familiarize the students to the Green Building rating systems, design processes, regulations and prevailing best practices

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define the fundamental of green building design.

**CO2:** Identify the role of USGBC, GBCI and their structure.

**CO3:** Identify the criteria for the selection of site

**CO4:** Review the fundamental concepts of waste management system.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to Green Building &amp; Green Building Rating Systems</b> Introduction to Course, Syllabus and assessment, Fundamental concepts of Green Building Design and Sustainability. Green Rating regime and their scope (regional and global), Policies and legislations	L1, L2	6

<b>MODULE 2: LEED Lab &amp; Processes</b> LEED Systems: Organization, fundamentals & Role USGBC/GBCI, Structure of LEED rating (credit, prerequisites and requirements) and Impact categories, LEED Certification & registration process, What, How and where to collect data for LEED certification	L1, L2, L3	6
<b>MODULE 3: Site, Location and Transportation</b> Scope and criterion of sustainable site, Transport and resource footprint	L1, L3,L4	6
<b>MODULE 4: Buildings Material and Resources</b> Fundamental concepts (LCA), Waste management, 3Rs and Health), Procurement, declarations and documentations of Materials according to requirement of LEED certification	L1, L3,L4	6

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books:

- Altomonte, S., & Schiavon, S. (2013). Occupant satisfaction in LEED and non-LEED certified buildings. *Building and Environment*, 68, 66–76. <https://doi.org/10.1016/j.buildenv.2013.06.008>
- Azhar, S., Carlton, W. A., Olsen, D., & Ahmad, I. (2011). Building information modeling for sustainable design and LEED ® rating analysis. *Automation in Construction*, 20(2), 217–224. <https://doi.org/10.1016/j.autcon.2010.09.019>
- Leed. (2014). Reading for the R and D Community, 56(3), 25–27. [https://doi.org/10.1007/978-90-313-9258-2\\_26](https://doi.org/10.1007/978-90-313-9258-2_26)

### References:

- Newsham, G. R., Mancini, S., & Birt, B. J. (2009). Do LEED-certified buildings save energy? Yes, but... *Energy and Buildings*, 41(8), 897–905. <https://doi.org/10.1016/j.enbuild.2009.03.014>
- Suzer, O. (2015). A comparative review of environmental concern prioritization: LEED vs other major certification systems. *Journal of Environmental Management*, 154, 266–283. <https://doi.org/10.1016/j.jenvman.2015.02.029>

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment					
CT		TA	A	Total	ESE	ESJ			
I	II								

10	10	25	5	50	50	0	50	100	2	3
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CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	-	2	--	3	1	2	-	-	-	--	-	2	-	1	--
CO2	-	-	2	--	3	1	2	-	-	-	--	-	2	-	1	--
CO3	-	-	2	--	3	1	2	-	-	-	--	-	2	-	1	--
CO4	-	-	2	-	3	1	2	-	-	-	-	-	2	-	-	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>INTERIOR DESIGN (ARC2718)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	1	1	3
Pre-requisites/Exposure	Architectural Design - IV					
Co-requisites	Architectural Design - V					

### **Catalog Description**

The aim of this course is to make students understand the application of design principles in interiors. The subject Interior Design is a specialized course offered in architecture which deals with functionality, safety and provides an aesthetically pleasing space for users. This semester will deal with minute details and construction techniques involved in interior design. The subject will also be integrated with a small component of design exercise with the current or previous semester design works. The course will include several exercises in relation to sit visits, market surveys, presentation, reports, etc.

### **Course Objectives:**

The objective of this course is

1. To equip the students with varied aspects of theory and practice of Interior Design, and develop skills to deal with diverse interior spaces.
2. To understand qualities of spaces and develop their skills in designing for functional and meaningful interior space.
3. To initiate students into theory and practice of Interior design.
4. To merge theoretical and practical knowledge of interior design of a building.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1:** Apply elements of interior design in their design process.

**CO2:** Explain the application of design principles in interiors.

**CO3:** Create interior design model with the help of furniture, lighting fixtures, furnishings, paintings, sculptures, etc.

**CO4:** Design modern interiors using modern materials and techniques.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction and basic principles of design</b> Purpose, scope, objectives, history and importance of Interior Design. Elements and principles of interior design and their application in the context of buildings. Aesthetic order, functional Value and Psychological impact of various elements of Interior Design. Application of Colour, Texture, Landscaping, Artificial and Natural Lighting in the Building interiors.	L1, L2	9
<b>MODULE 2: Principles and Elements of Interior Design</b> Elements of Interior Design, Role in interiors. Space making elements like wall, column, partition screen, floor, furniture, interior landscaping etc., their design value, colour theories and schemes, light	L2, L3, L4	9
<b>MODULE 3: Understanding Furniture work and furnishings in Interior</b> Understanding furniture layout, furniture design with the construction technique, types of furniture and their usage, construction materials and fabrics used in furniture designing, cost estimation, understanding works of great masters. Furniture, Furnishings, Fabrics, Murals, Paintings, Sculpture, Lighting Fixtures, Floor coverings, Wall coverings and related materials. Study of furniture designs, Built-in furniture, Movable furniture, Modular furniture.	L2, L3, L4	9



<p><b>MODULE 4: Modern trends in Interior design</b></p> <p>Understanding and designing modern interiors using modern materials and techniques. Study Report of an existing DESIGN PROJECT. Space organization in interiors--presentation of the complete interior scheme of a given projects such as Library, Public Halls, Conference Room, Commercial buildings etc.</p>	<p>L4, L5, L6</p>	<p>9</p>
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*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books/References:**

- Beecher, M. A., & Pile, J. (2002). *A History of Interior Design*. *APT Bulletin*, 33(1), 57. <https://doi.org/10.2307/1504797>
- Demirbaş, Ö. O. (2017). *The Fundamentals of Interior Design*. *The Design Journal*, 20(4), 537–542. <https://doi.org/10.1080/14606925.2017.1325635>
- Di Cintio, L. (2019). *Design activism*. In *The Interior Architecture Theory Reader* (pp. 376–384). Routledge. <https://doi.org/10.4324/9781315693002-44>
- Hayles, C. S. (2015). *Environmentally sustainable interior design: A snapshot of current supply of and demand for green, sustainable or Fair Trade products for interior design practice*. *International Journal of Sustainable Built Environment*, 4(1), 100–108. <https://doi.org/10.1016/j.ijbsbe.2015.03.006>
- Margolin, V., & Margolin, S. (2002). A “*Social Model*” of Design: *Issues of Practice and Research*. *Design Issues*, 18(4), 24–30. <https://doi.org/10.1162/074793602320827406>
- Merrell, P., Schkufza, E., Li, Z., Koltun, V., & Agrawala, M. (2011). *Interactive Furniture Layout Using Interior Design Guidelines*. *ACM Transactions on Graphics*, 30(4), 1–10. <https://doi.org/10.1145/2010324.1964982>
- Stoddart, A. (2012). *Interior design*. *Nature Materials*, 11(10), 829–829. <https://doi.org/10.1038/nmat3445>
- Ulrich, R. S. (1991). *Effects of Interior Design on Wellness*. *Journal of Health Care Interior Design*.
- Ulrich, R. S. (1991). *Effects of interior design on wellness: theory and recent scientific research*. *Journal of Health Care Interior Design: Proceedings from the ... Symposium on Health Care Interior Design*. Symposium on Health Care Interior Design.

**Modes of Evaluation: Assignment/ Case Study/ Market Survey/ Presentation/ Written Examination**

### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	--	1	--	--	--	--	-	2	-	2	3	--	1
CO2	2	-	-	--	1	--	--	--	-	-	2	-	2	3	--	1
CO3	2	-	-	--	2	--	--	--	-	-	1	-	2	3	--	1
CO4	2	-	-	-	1	-	-	-	-	-	2	-	2	2	-	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>SPECIFICATION, ESTIMATION AND VALUATION (ARC2720)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Building Materials & Construction Technology - V, Workshop Practice & Site Exposure					
Co-requisites	Building Material and Construction Technology-VI					

### Catalog Description

The aim of this course is to make students familiar with the theory and practice of specifications and estimation, and quantity surveying; along with its importance in the field of building construction. The process of writing specification document for materials, labour, budgets and; estimating the cost and time of construction works shall be covered. The preparation of bill of quantities, optimum resource consumptions and introduction to BIS and other standardized institutions is also a part of the course.

### Course Objectives

The objective of this course is

- To develop a real-time judgment of quantity surveying, details specifications, estimations and valuation
- To develop skill for precise and approximate estimations and be able to estimate and specify quantities of various items of material and work involved in architectural and planning projects

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Discuss the importance and usage of specification, estimation, valuation and depreciation

**CO2:** Describe the detailed specification of various common building materials

**CO3:** Execute and implement the appropriate methods for preparing the estimates.

**CO4:** Compare, evaluate and interpret the building typologies for doing the valuation.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction</b>	L1, L2,	9

Why the knowledge of quantity surveying and specifications is necessary for architects and planners? Significance and methods of writing specifications, classifications of specifications, sources of specifications; Types and methods of cost estimation for different types of projects, rates and sources of rates for different components of projects; Cost Index.	L3	
<b>MODULE 2: Specification</b> Specifications for common building materials and building trades, earthwork, structure (framing), flooring, stonework, plasters, waterproofing of basements and terraces, roofing, doors and windows, elevators. Site development and earth works; Water supply network and distribution systems; Sewer systems; Electrical and telephone networks; Landscaping, roads, pathways, boundary wall, pools, lighting.	L1, L2, L3	9
<b>MODULE 3: Estimating</b> Calculation of plinth area, floor area, carpet area and circulation area, Preliminary estimates- plinth area rates and cost indices, Detailed estimate-modes of measurement, taking off quantities from drawings, Bill of Quantities (BOQ) and Bill of Materials (BOM), Deriving rates for items from labour and material costs based on CPWD Schedule of Rates, scheduled and non-scheduled items, Establishing market rates. Cost estimation and determination of rates for different types of housing; Cost estimation and determination of rates of works involved in the infrastructure services (roads, water supply, sewer systems, etc.); Costing procedure for different land use categories, development works, interest on investment, and phasing.	L1, L2, L3	9
<b>MODULE 4: Valuation</b> Value and purpose of valuation; Definition and importance of valuation of land and buildings; Factors affecting property and land value at a city and clarity level; Legal, fiscal and administrative measures of land value; Sinking fund; Betterment; Scrap value, salvage value, outgoings; Capitalized value of buildings; appreciation, depreciation and their types, methods of calculating depreciation.	L1, L2, L3	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Deshpande, G. B. &Nayak, J. P. (2018). *Quantity Suveying, Contracts and Tenders*. NiraliPrakashan.
- Gangrade, Mukesh N. (2018). *Estimating and Costing*. Nirali Prakashan.
- Kohli, R. C. (2013). *A Textbook of Estimating, Costing & Accounts*. S. Chand.
- Rosen, Harold J. &Kalin, Mark. (2010),*Construction Specifications Writing: Principles and Procedures*, John Wiley& Sons Publication.

### Reference Books

- Aigner, Dennis, Lovell, C. A. Knox & Schmidt, Peter. (1977). *Formulation and estimation of stochastic frontier production function models*. Journal of Econometrics, 6(1), 21-37. [https://doi.org/10.1016/0304-4076\(77\)90052-5](https://doi.org/10.1016/0304-4076(77)90052-5)
- Arthanareswaran, R. (2015). *A course material on Estimation and Quantity Surveying*.
- Can, Ayse. (1992). *Specification and estimation of hedonic housing price models*. *Regional Science and Urban Economics*, 22(3), 453-474. [https://doi.org/10.1016/0166-0462\(92\)90039-4](https://doi.org/10.1016/0166-0462(92)90039-4)

### Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2	--	--	--	--	--	--	2	--	1	2	--	3
CO2	1	2	1	2	--	--	--	--	--	--	2	--	1	2	--	2
CO3	1	2	1	2	--	--	--	--	--	--	2	--	1	2	--	2
CO4	1	2	1	1	2	--	--	--	--	--	2	--	2	2	--	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE- PEOPLE CULTURE AND BUILT ENVIRONMENT- III (ARC2721)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	History of Architecture, Architectural Design – III					
Co-requisites	Theory of Architecture					

### Catalog Description

The objective of this course is to offer opportunities in specialized or advance learning in psychological and sociological aspects which are of concern to Architecture. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide students the exposure to understanding society and various built forms produced by society. The course will also provide the students hands-on cultural, sociological and psychological studies of the built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross fertilization with other courses. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on projects. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### Course Objectives

The objective of this course is

- To understand the basic principles of psychology, sociology and culture of settlement.
- The course intends to study and understand the typical components of city in order to appreciate how these elements contribute to the quality of life of urban communities.
- To familiarize students with decisive strategies that brings inclusivity and equality in the designs of built forms.
- To develop interdisciplinary understanding and sensitivities of future architects.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Develop a relationship between man and his larger social environment, with special emphasis on aspects that are likely to affect intervention in or creation of, the built environment (predominantly urban)

**CO2:** Develop a language and vocabulary for discussions/ analysis on the sociological/ psychological dimensions of architecture.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Introduction to Psychology, Sociology and Built Environment</b>            Basic introduction to various critical social aspects; Role of psychology in architecture; Role of sociology in built environment; Determinants of sociology- social structure, social status, social control, social institutions, social mobility; Inclusive Built Environment; Barrier free designs and built environments;            Various case studies related to gender and architecture, community development- community response towards development strategy etc.</p>	L1, L2	8
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	16

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books/References**

- Cragun R.T.(2006). Introduction to Sociology, Wikibooks.
- Giddens, A (2006) Sociology, Polity Press, Cambridge (UK)
- Lynch, K. (1960) The Image of the City, Joint Centre Publication, USA
- Oomen T.K. and Venugopal C.N. (2004), Sociology, Eastern Book Company.
- Porteous, Douglas, J. (1977), Environment Behaviour: Planning and Everyday Urban Life, Addison Wesley
- Sinha A. (2013) “An India for Everyone: A Path of Inclusive Development, Harpercollins
- Steve Barkan (2010), Sociology: Understanding and Changing the Social World, Flat World Reference Books
- Tejchman A. (2016) “The Politics of Inclusive Development”, Palgrave Macmillan.

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total	100	3	0
I	II									
10	10	25	5	50	0	50	50			

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related



	<b>ELECTIVE- ECOLOGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT – III (ARC2722)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Environmental Sciences, Building Services-1, Building Services-2					
Co-requisites	Architectural Design, Building Services-3					

### **Catalog Description**

The aim of this course is to offer opportunities in specialized or advance learning in ecology, environment and sustainable aspects which are of concern to Architecture. The course will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide students the exposure to understanding ecology and various environmental problems faced by settlements. The course will also provide the students hands-on ecological and environmental studies of built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross learning with other courses. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on projects. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To understand the basic principles of ecology, environment and sustainable development.
- The course intends to study and understand the different components of city in order to understand how these elements contribute to environment quality.
- To establish the significance of the ecological issues, their impact and initiatives to address the same in the built environs to achieve sustainable development.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Develop a relationship between man and ecology, will understand critical environmental issues and need to address the m by using advanced technology.

**CO2:** Produce reports and presentation.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Ecology, Environment and Sustainable Development</b></p> <p>Basic introduction to ecology; Interrelation between natural and built environment; Importance of environment sustainability in built environment; Energy conservation, renewable sources: wind, solar, geothermal, bio-fuels; Materials minimizing, recycling, reducing energy content, etc; Other environmental issues related to solid waste management, water resources, air quality, storm water drainage etc;</p> <p>Various case studies related to traditional / vernacular buildings and settlements demonstrating relationship between climate, local material resources and settlement/ building forms.</p>	L1, L2	8
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	16

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books/References

- Bakari, Mohamed El-Kamel (2017). The Dilemma of Sustainability in the Age of Globalization: A Quest for a Paradigm of Development. New York: Lexington Books. ISBN 978-1498551397
- Blewitt, J. (2008). Understanding Sustainable Development. London: Earthscan. pp. 21–24. ISBN 978-1-84407-454-9.
- Fulekar, M. H., Pathak, B., Kale, R. K. (2014) Environment and Sustainable Development' Springer Nature; ISBN-10: 8132211650; ISBN-13: 978-8132211655
- Goudie, Andrew (2000). The Human Impact on the Natural Environment. Cambridge, Massachusetts: This MIT Press. pp. 203–239. ISBN 0-262-57138-2.
- James, Paul (2014). Urban Sustainability in Theory and Practice. doi:10.4324/9781315765747. ISBN 978-1-315-76574-7.
- James, Paul; Magee, Liam (2016). "Domains of Sustainability". In A. Farazmand (ed.). *Global Encyclopedia of Public Administration, Public Policy, and Governance*. Springer.

- Modak, P. (2017) Environmental Management Towards Sustainability, CRC Press, ISBN-10: 9781498796248
- Odum, E. P. (1971). Fundamentals of Ecology (Third ed.). New York: Saunders. ISBN 0-7216-6941-7.
- Porteous, Douglas, J. (1977), Environment Behaviour: Planning and Everyday Urban Life, Addison Wesley
- Thangavel, P., Sridevi, G. (2015) Environmental Sustainability, Springer Nature, ISBN-10: 9788132220558
- Walker, Brian and Salt, David (2006) Resilience Thinking: Sustaining ecosystems and people in a changing world. Island Press. p. xiii. ISBN 978-1597260930.
- Wandenberg, JC (August 2015). Sustainable by Design. Amazon. p. 122. ISBN 978-1516901784

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE - COMPUTER APPLICATIONS AND ADVANCE TECHNOLOGIES – III (ARC2723)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Architectural Graphic Skills					
Co-requisites	Architectural Design, Building Materials and Construction Technology					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in computer applications and advance technologies which are of concern to Architecture. The course will generally be conducted in the tutorial mode to encourage exploration and skill developments. The aim of this course is to provide students the exposure to understanding new technological innovations and their applications in field of architecture. The course will also provide the students hands-on experience of new software and applications. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross learning with other courses. The course would be conducted through data base creation, analysis, presentation. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To familiarize students with use of computers in architecture and with impact of Information Technology on architectural knowledge system and practice.
- To critically explore current advancements in smart technologies available for sustainable built environments.
- To sensitize students about strategies for innovations by using latest technologies.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Students will be exposed to the latest software and computer applications available in the field of architecture.

**CO2:** Students will be aware of new advanced technologies available for architecture.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to computer applications and advance technologies</b></p> <p>Basic introduction to information technology in architecture; Introduction to smart technologies in field of architecture; Applications of information technology in architecture; applications of smart technologies in architecture;</p> <p>Case studies related to use of information technology and advance technology in architecture and built environment. .</p>	L1, L2	9
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of project; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L3, L4, L5, L6	18

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

#### Text Books/References

- Ching, F. D. (2009) Architectural Graphics, John Wiley and Sons
- D'Ulizia, A., Ferri, F., Grifoni, P., & Guzzo, T. (2010). Smart homes to support elderly people: innovative technologies and social impacts. In *Pervasive and Smart Technologies for Healthcare: Ubiquitous Methodologies and Tools* (pp. 25-38). IGI Global.
- Deakin, Mark; Al Waer, Husam (2011). "From Intelligent to Smart Cities". *Journal of Intelligent Buildings International: From Intelligent Cities to Smart Cities*. 3 (3): 140–152.
- Graham, S.; Marvin, S. (1996). *Telecommunications and the city: electronic spaces, urban place*. London: Routledge. ISBN 9780203430453.
- Kedar, Seema (2009). *Database Management System* Technical Publications. ISBN 9788184316049.
- Komninos, Nicos (22 August 2013). "What makes cities intelligent?". In Deakin, Mark (ed.). *Smart Cities: Governing, Modelling and Analysing the Transition*. Taylor and Francis. p. 77. ISBN 978-1135124144
- McLaren, Duncan; Agyeman, Julian (2015). *Sharing Cities: A Case for Truly Smart and Sustainable Cities* MIT Press. ISBN 9780262029728.
- Peris-Ortiz, Marta; Bennett, Dag R.; Yábar, Diana Pérez-Bustamante (2016). *Sustainable Smart Cities: Creating Spaces for Technological, Social and Business Development*. Springer. ISBN 9783319408958.

- Reynolds, George (2009), *Ethics in Information Technology*, Cengage Learning, ISBN 978-0-538-74622-9
- Silberschatz, Abraham (2010). *Database System Concepts* McGraw-Hill Higher Education. ISBN 978-0-07-741800-7
- Wagginton, M., Harris, J (2002) *Intelligent Skins*, Reed Elsevier, Oxford
- Wang, S. (2010) *Intelligent Buildings and Building Automation*, Spon Press, USA, ISBN10:0-415-47570-8

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Eighth Semester

	<b>BUILDING MATERIALS AND CONSTRUCTION TECHNOLOGY – VIII (ARC2801)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	0	2	2	5
Pre-requisites/Exposure	Building Materials And Construction Technology –VII					
Co-requisites	Architectural Design – VII					

### Catalog Description

The aim of this course is to make students familiar with modern techniques of building construction and modern materials usage. This course will introduce aspects related to construction terminology types, application of technique, detailing, site visit and material collection. The course is important as it will familiarize the students with the new and latest terminologies of Architectural construction like Pre-fabrication and pre-stressed construction.

### Course Objectives

The objective of this course is

- To understand different technology used in latest construction methods
- To study modern construction techniques used.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Discuss about Modular construction techniques.

**CO2:** Discuss the process of pre-fabrication in advanced building construction process

**CO3:** Summarize the conceptual idea behind the development of pre-stressed structural component for general use.

**CO4:** Prepare and understand drawings of dia-grid, domes and arches.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction to Modular construction</b> Introducing current construction technique like Modular construction and fast pace construction. Discussion about terminologies used and their meanings	L1, L2, L3	15
<b>MODULE 2: Introduction to Pre-fabrication Technology</b> Introduction to the topic and its relevance in the construction field. Aspects such as – construction terminology, types, Applications, Detailing. Site visits and material collection from Pre-Fabrication manufacturing units and live examples	L1, L2, L3	15
<b>MODULE 3: Introduction to Pre-stressed Technology</b> Introduction to the topic and its relevance in the construction field. Aspects such as – construction terminology, types, Applications, Detailing. Site visits and material collection from Pre-Stressed manufacturing units and live examples.	L1, L2, L3	15
<b>MODULE 4: Introduction to Advanced Structural Designs</b> Introduction to the Diagrid Structures, domes structures, arches. Introduction to the Design of culverts, overhead water tanks	L1, L2, L3	15

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- Barry. R. (1996). Construction of Buildings, John Wiley and Sons Ltd
- Khanna P.N. (2001). Civil Engineering Handbook, Delhi: Engineers' Publishers
- Khurmi R. S. (2015). Strength of Materials (Mechanics of Solids), S.Chand Publications.
- Mackay J.K. Vol. 1-4 (2014). Building Construction, Delhi, Persons Publications
- Mitchell G.A.(1959)Elementary Building Construction, HarperCollins Distribution Services
- Punmia, B.C. (2005). Building Construction, New Delhi: Laxmi Publishers
- Rangawala, (2017). Building Construction, Gujrat: Charotar publisher

### **Reference Books**

- Citherlet, S., Di Guglielmo, F., & Gay, J. B. (2000). Window and advanced glazing systems life cycle assessment. Energy and Buildings, 32(3), 225–234. [https://doi.org/10.1016/S0378-7788\(98\)00073-5](https://doi.org/10.1016/S0378-7788(98)00073-5)
- Mikosch, T., & Kallenberg, O. (1998). Foundations of Modern Probability. Journal of the American Statistical Association, 93(443), 1243. <https://doi.org/10.2307/2669881>
- Tasou, P. (2008). Trusses. In Steel Designers' Manual: The Steel Construction Institute, Sixth Edition (pp. 541–576). Blackwell Science Ltd. <https://doi.org/10.1002/9780470775097.ch19>



**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	5	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	3	--	2	1	--	2	--	--	1	--	2	2	1	--	3
CO2	--	3	--	2	1	--	2	--	--	1	--	2	2	1	--	3
CO3	--	3	--	2	1	--	2	--	--	1	--	2	2	1	--	3
CO4	--	3	--	2	1	--	--	--	--	1	--	2	2	1	--	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>ARCHITECTURAL DESIGN - VIII (ARC2809)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	1	1	4	2	8
Pre-requisites/Exposure	Building Materials & Construction Technology – VII					
Co-requisites	Construction Management					

### **Catalog Description**

The aim of the design studio is to expose the students to Urban scale problems and to enable them to visualize the contextual part of a built form. They need to understand, as to what goes beyond the premise of a single building or an area and where its boundaries merge into surrounding built form with different land uses and activities. The studio problem therefore will focus on study and intervention within areas that have the context of design issues like, pedestrian and traffic movement, mixed activities etc. and have the scope of redevelopment.

The design problem of Urban design scale is to be introduced, example; Redesigning of existing Urban area by studying and identifying the problems associated with it. The project would be a medium sized urban design intervention. The design solution would address issues like demography, market value, land use patterns etc. Other design issues are the detailing of open and built areas after studying human and movement patterns. The project should be substantiated by detailed site surveys and reading about urban design principles.

### ***Design Exercise: Urban Design Studio***

#### **Course Objectives:**

The objective of this course is

- To understand the city under study, read the issues in a given area after a methodical analysis and propose housing /urban design/ campus design solutions.

- To compare the built and un-built environment around.
- To formulate and highlight the issues of Urban areas.
- To justify the environment for sensitivity.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1:** Compare the built and un-built environment.

**CO2:** Demonstrate their understanding of urban issues relating to the built environment.

**CO3:** Prepare quantitative data for existing and future proposals.

**CO4:** Prepare a vision statement

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Identify the study area</b> Pilot survey of an area to identify the project, Survey the existing urban environment. Delineate the study area, collect initial data, prepare brief questions for responses, Reading the area for commonalities, Take response from the users.	L4, L5, L6	30
<b>MODULE 2: Presenting and Analysing the collected data</b> Mapping of collected data using techniques and methods, Use of both qualitative and qualitative data. Co-relating the various data for inter-relationship, Using different methods for analysis, Prepare activity wise layers	L4, L5, L6	36
<b>MODULE 3: Drawing inferences for interventions</b> Picking up issues for addressing, Thinking about developing sensitive responses to the identified issues, Take case of examples for better understanding, Prepare models for spatial analysis, Prepare quantitative data for existing and future proposals.	L4, L5, L6	42
<b>MODULE 4: Formulation of the Design Programme and Strategies for intervention</b> Prepare the vision statement, phasing of the project, before and after images, Public Private Participation, Implementation of the design solution.	L4, L5, L6	36

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5:Synthesis, L6:Evaluation*

**Text Books & References:**

- Béjar, R., Latre, M. Á., Nogueras-Iso, J., Muro-Medrano, P. R., & Zarazaga-Soria, F. J. (2009). An architectural style for spatial data infrastructures. *International Journal of Geographical Information Science*, 23(3), 271–294. <https://doi.org/10.1080/13658810801905282>

- Chiara, J. D., & Callender, J. (1983). Time-Saver Standards for Building Types. *McGraw-Hill International Edition*.
- Givoni, B. (2004). Time Saver Standards for Urban Design: Urban Design and Climate. *Digital Engineering Library @ McGraw-Hill*, 1–14.
- Head, A. J. (2017). Planning and Designing Academic Library Learning Spaces: Expert Perspectives of Architects, Librarians, and Library Consultants. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2885471>
- Julius, P., & Zelnik, M. (1979). Human Dimension & Interior Space. *Vasa*. Retrieved from <http://medcontent.metapress.com/index/A65RM03P4874243N.pdf>
- Wolfenden, A., & Chusid, M. (1991). Time-Saver Standards for Building Types: 3rd Edition. *Journal of Testing and Evaluation*, 19(4), 347. <https://doi.org/10.1520/jte12583j>
- Head, A. J. (2017). Planning and Designing Academic Library Learning Spaces: Expert Perspectives of Architects, Librarians, and Library Consultants. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2885471>

**Modes of Evaluation: Case Study/ Site Visit/ Portfolio Submission:**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	8	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	2	3	-	-	-	-	-	-	-	-	1	2	-	-
CO2																
CO3																
CO4																

1: strongly related, 2: moderately related and 3: weakly related

	<b>STRUCTURE - VIII (ARC2815)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Structure – VII					
Co-requisites						

### **Catalog Description**

The aim of this course is to enable students to design advanced structures system and their basic components. This subject covering three major different types of structures i.e. Pneumatic structure, Geodesic Dome and Bridges. The fundamental aspects of analysis and design and also discusses the practical requirements such as safety, feasibility and economy these structures. Along this some iconic examples as a case study will also cover in this course. The subject will be taught in congruence with the Design studio, and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same.

### **Course Objectives**

The objective of this course is

- To understand the design of Pneumatic structures.
- To learn the behavior and design of Geodesic Dome.
- To understand the design of Bridges.
- To gain an educational and comprehensive experience with the various types of Iconic Structure.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Design Pneumatic structures.

**CO2:** Design Geodesic Dome structures.

**CO3:** Design various types of Bridges.

**CO4:** Understanding of different types of modern and contemporary iconic buildings.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Pneumatic Structure</b> Introduction to Design Specification for Pneumatic Structure, Design principles, Components, Limitations in Design, Economic parameters, Case Studies.	L1, L2, L3	09
<b>MODULE 2: Geodesic Dome</b> Introduction to Design Specification for Geodesic Dome, Design principles, Components, Limitations in Design, Economic parameters, Case Studies.	L1, L2, L3	09
<b>MODULE 3: Space Frames</b> Introduction to Design Specification for Space Frames, Design principles, Components, Limitations in Design, Economic parameters, Case Studies.	L1, L2, L3	09
<b>MODULE 4: Modern &amp; Contemporary Structures</b> Case studies of different Indian buildings structure like Hall of nation, STC building, Lotus temple, Cricket Stadium Ahmedabad etc, Case Studies of various International buildings structure like Eiffel tower, Louvere, Guggenheim Museum, Burj Khalifa, Habitat 67, Dupli Casa etc. (at least 10 different typology building structures Indian and Internationally focused on mainly roof system.	L1, L2, L3	09

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### **Text Books**

- Herzog, Thomas (1976). Pneumatic Structures: A Handbook of Inflatable Architecture, Oxford University Press
- Otto, Frei (1967). Tensile Structures Volume One: Pneumatic Structures (v. 1), The MIT Press Ltd; 1st Printing edition
- Chen, Wai -Fah, Duan, Lian (2014). Bridge Engineering: Substructure Design, CRC Press.
- Loon, Vam Borin, (1999). Geodesic Domes: Demonstrated, Tarquin Publications

### **References**

- Arya, C. (2009). Eurocode 3: Design of steel structures. In Design of Structural Elements (pp. 375–433). CRC Press. <https://doi.org/10.1201/b18121-13>
- Coutie, M. G. (1997). Structural and stress analysis. Engineering Structures, 19(1), 92. [https://doi.org/10.1016/s0141-0296\(97\)81457-5](https://doi.org/10.1016/s0141-0296(97)81457-5)
- Cowin, S. C. (2001). Mechanics of materials. In Bone Mechanics Handbook, Second Edition (pp. 6-1-6–24). CRC Press.
- Emmitt, S., & Gorse, C. (2014). Barry's Advanced Construction Of Buildings Third Edition. John Wiley & Sons, Ltd (Vol. 28, p. 581).

- Guadagnini, M. (2008, May). Mechanics of Composite Materials: Preface. Mechanics of Composite Materials, 44(3), 197–198. <https://doi.org/10.1007/s11029-008-9011-3>
- Oppermann, R. H. (1941). Strength of materials, part I, elementary theory and problems. Journal of the Franklin Institute, 231(1), 96. [https://doi.org/10.1016/s00160032\(41\)90378-2](https://doi.org/10.1016/s00160032(41)90378-2)

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	3	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	--	--	1	3	--	--	1	--	--	--	--	3	1	--	--
CO2	--	--	--	1	3	--	--	1	--	--	--	--	3	1	--	--
CO3	--	--	--	2	3	--	--	1	--	--	--	--	2	1	--	--
CO4	--	--	--	2	3	--	--	1	--	--	--	--	2	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>TOWN PLANNING (ARC2816)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	History of Architecture – III					
Co-requisites	Building Bye-laws					

### **Catalog Description**

The aim of this course is to familiarize the students with Planning concepts and process in urban and regional planning. The course provides insights into ancient Town Planning to the contemporary best practices. The aim is to familiarize the students with the process of evolution of cities, concepts related to humanitarian planning processes and skill development to identify planning issues in existing areas and develop solutions at basic levels. The subject will be taught in congruence with the Design studio and assignments for the subject will be linked to the design exercises to achieve higher level of learning and understanding the practical application of the same

### **Course Objectives**

The objective of this course is to

- To familiarize the students with Planning concepts and process in Urban and Regional Planning.
- To understand the various elements, classifications and typology of humans settlements.
- To develop research interest in the theory of urban planning and development studies.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Define the various elements, classification and typology of planning

**CO2:** Define types of settlements based on different criteria and different parameters.

**CO3:** Review the condition of development/status of urbanization.

**CO4:** Classify constituents of town or city and develop different type of Plans.



<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction to Planning and its concepts</b> Definitions, planning as hierarchical process, essential features of planning, town planning as a practice, Regional Planning, Rural Planning, Transport Planning, Housing. Various Roles that Planners Play- in Development Authority. Planning concepts and their relevance to Indian Planning practice in respect of Ebenezer Howard – Garden city concepts and contents – Patrick Geddes – Conservative surgery – case study – C.A. Perry – Neighborhood concept Le Corbusier – concept and case studies	L1, L2	5
<b>MODULE 2: Classification and history of Cities</b> Definitions of urbanization such as world cities, city-regions, global cities; Census definitions such as Class-I, Class-III cities. Example of good planned cities and their planner. Analysis of old– Egyptian, Mesopotamian, Greek, Roman, Renaissance, and Modern cities - Garden cities, Chandigarh etc.	L1, L2	5
<b>MODULE 3: Planning process and standards</b> Identification of values, norms, goals and objectives, methodology of plan formulation, site selection, land use mapping, population projection, calculation of housing and community services, calculation and laying of physical infrastructure, public participation, plan visioning exercise, community dispute resolution as per URDPFI guidelines	L1, L2	6
<b>MODULE 4: Types of Plans and modern approach</b> Comprehensive plans, development plans, local plans, district plans, public participation, people and plans, regional planning, Five Year Plans, District Development Plans, Regional Plans, Master Plans, Strategic Plans, Zonal Plans, Urban Renewal Plan – Meaning, Redevelopment, Rehabilitation and Conservation – JNNURM, SEZ – case studies. Introduction, Benefits and Planning components of Green City (e.g. Vancouver), Compact City (e.g. Sky city, China) and Smart City (e.g. Malta)	L1, L2	8

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- Arthur B. Gallion et.al, (1957), Urban Pattern, The Urban Pattern- City Planning and Design: Publication Van Nostrand
- Binode Dutt (1925), Town Planning in Ancient India
- C. A. Doxiadis (1971), Ekistics: An Introduction to the Science of Human Settlements, Discussions On Ekistics: Nature, Man, Shells, Society, Networks. Summary Of The Athens Ekistics: Jstor
- G.K. Hiraskar (20th Edition, 2017), Fundamentals of Town Planning: Dhanpat Rai Publications
- URDPFI Guidelines (2014): Government of India

### Reference Books

- Bradshaw, M. (1988). Cities for people. *Town & Country Planning*, 57(4), 114–116. <https://doi.org/10.5860/choice.48-4292>
- G. Cherry (1999), *Social Town Planning*, ISBN 0-415-17241-1, Taylor & Francis e Library, 2001
- Howard, E. (2013). Garden cities of To-morrow. *Garden Cities of To-Morrow* (pp. 1–168). Taylor and Francis. <https://doi.org/10.4324/9780203716779>
- J. B. Mcloughin (1969), *Urban and Regional Planning – A System Approach*: New York, Praeger
- Lewis Keble (1969), *Principles and practice of Town and Country Planning*: Estate Gazette, UK

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme							Total marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ				Total
I	II									
10	10	25	5	50	50	0	50	100	2	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	-	--	2	3	2	--	--	--	--	--	--	3	--	--	1
CO2	-	-	--	3	2	1	--	--	--	--	--	--	2	--	--	1
CO3	-	-	--	2	1	1	--	--	--	--	--	--	2	--	--	1
CO4	-	-	--	3	3	2	--	--	--	--	--	--	2	--	--	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>LEED LAB-II (ARC2817)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	LEED Lab – I					
Co-requisites	Architectural Design – VIII					

### Catalog Description

The aim of this course is to provide fundamental knowledge about natural and built environment. And also introduces fundamental concepts to understand environmental processes. The curriculum further incorporates understanding in relation to Indian context. Course will be interdisciplinary and flexible.

### Course Objectives

The objective of this course is

- To understand the concept of an Energy and climate
- To understand the importance of Water Efficiency
- To familiarize the students with LEED Arc

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define basic concepts of building loads, energy efficiency, environmental concern

**CO2:** Prepare a documentation plan of water efficiency.

**CO3:** Calculate the indoor environmental quality for comfort and health.

**CO4:** Define basic concepts for building data analysis and prepare a report on environment impact on built up area.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Energy and Climate</b> Basic concepts I (Building loads, Energy efficiency, Environmental concerns), Basic concept II (Electrical systems, Visual & thermal comfort and other concepts), Energy commissioning & performance management Energy audit process, equipment and tools	L1, L2	6
<b>MODULE 6: Water Efficiency</b>	L1, L2,	6

Water use pattern, source and conservation scope (including water harvesting and treatment), Water flow, fixtures and plumbing networks and water efficient appliances, Water Audit: Performance management and monitoring, LEED requirement and documentation plan	L3	
<b>MODULE 7: Indoor Environment &amp; Human Comfort</b> Fundamentals of Indoors environmental quality (ventilation, air quality, indoor emission, green cleaning) Health and occupational comfort (Natural lighting, Thermal, Quality view & assessment-survey)	L1, L3,L4	6
<b>MODULE 4: LEED Arc and Project Communication</b> Basic concepts and pre-requisites, Buildings Data Analysis, Demonstration of input Data in Arc Platform and create output result for the 5 sustainability indicators. Environmental/Building codes, Impact of built environment, sustainable & regional design Project Documentation follow-up	L1, L3,L4	6

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### Text Books:

- Altomonte, S., & Schiavon, S. (2013). Occupant satisfaction in LEED and non-LEED certified buildings. *Building and Environment*, 68, 66–76. <https://doi.org/10.1016/j.buildenv.2013.06.008>
- Azhar, S., Carlton, W. A., Olsen, D., & Ahmad, I. (2011). Building information modeling for sustainable design and LEED ® rating analysis. *Automation in Construction*, 20(2), 217–224. <https://doi.org/10.1016/j.autcon.2010.09.019>
- Leed. (2014). Reading for the R and D Community, 56(3), 25–27. [https://doi.org/10.1007/978-90-313-9258-2\\_26](https://doi.org/10.1007/978-90-313-9258-2_26)

#### References:

- Newsham, G. R., Mancini, S., & Birt, B. J. (2009). Do LEED-certified buildings save energy? Yes, but... *Energy and Buildings*, 41(8), 897–905. <https://doi.org/10.1016/j.enbuild.2009.03.014>
- Suzer, O. (2015). A comparative review of environmental concern prioritization: LEED vs other major certification systems. *Journal of Environmental Management*, 154, 266–283. <https://doi.org/10.1016/j.jenvman.2015.02.029>

#### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment					
CT		TA	A	Total	ESE	ESJ			
I	II								

10	10	25	5	50	50	0	50	100	2	3
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CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	-	-	2	--	3	1	2	-	-	-	--	-	2	-	1	--
CO2	-	-	2	--	3	1	2	-	-	-	--	-	2	-	1	--
CO3	-	-	2	--	3	1	2	-	-	-	--	-	2	-	1	--
CO4	-	-	2	-	3	1	2	-	-	-	-	-	2	-	1	-

1: strongly related, 2: moderately related and 3: weakly related

	<b>DISSERTATION (ARC2837)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	1	3	0	6
Pre-requisites/Exposure	Research - I					
Co-requisites	Research - II					

### **Catalog Description**

The aim of this course is to enable students to establish a strong theoretical foundation, clarity of thought and also to orient the students to structured research in a focused manner. The process of study shall enable students to conduct in depth analysis and objective research on a topic of their interest. Students may be encouraged to select the topic which may eventually culminate in the Architectural Design Thesis in the subsequent semester.

### **Course Objectives**

The objective of this course is

- To enable students to establish a strong theoretical foundation, clarity of thought.
- To orient the students to structured research in a focused manner.
- To enable students to conduct in depth analysis and objective research on a topic of their interest.
- To select the topic this may eventually culminate in the Architectural Design Thesis in the subsequent semester.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Identify area of research for thesis

**CO2:** Identify a research problem, formulation of hypothesis and organize a study based on literature survey

**CO3:** Apply research methodology, tools and techniques to conduct a research

**CO4:** Present the research work carried out in a report format.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Selection of Topic</b> Students may choose a topic of their interest, related to Architecture and allied subjects; stating proper justification	L1, L2, L3	6
<b>MODULE 2: Background study/ Literature Review and Case Studies</b> Review of research paper, books, journals etc related to the topic. Studying, analysing and interpreting various similar case studies, nationally and internationally	L1, L2, L3	6
<b>MODULE 3: Research Design</b> Data Collection, Data Analysis and Data Interpretation; the extensive methodology to be adopted for conducting the research along with various tools and techniques	L1, L2, L3, L4	12
<b>MODULE 4: Presentation</b> Presenting the research work done on identified topic which may eventually culminate in the Architectural Design Thesis of the subsequent semester. Students can thus utilise this as an opportunity for pre-Thesis study, amounting to literature review and relevant case studies which are otherwise required for Thesis.	L1, L2, L3	48

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Kothari, C.R. (1985). *Research Methodology*, Delhi: New Delhi International Publishers

### Reference Books

- Dwyer, M. (1995). A guide to the Harvard referencing system. *British Journal of Nursing (Mark Allen Publishing)*, 4(10), 599–602. <https://doi.org/10.12968/bjon.1995.4.10.599>
- Hofstee, E. (2006). The Harvard Referencing System. In *Constructing a Good Dissertation A Practical Guide to Finishing a Master's, MBA or PhD on Schedule* (p. 300). Retrieved from <http://www.exactica.co.za/dn/exactica-book-harvard-referencing.pdf>
- Mühl, J. K. (2014). Research methodology. In *Contributions to Management Science* (pp. 75–100). Springer. [https://doi.org/10.1007/978-3-319-04069-1\\_4](https://doi.org/10.1007/978-3-319-04069-1_4)
- Peffers, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S. (2007). A design science research methodology for information systems research. *Journal of Management Information Systems*, 24(3), 45–77. <https://doi.org/10.2753/MIS0742-122240302>
- Soediono, B. (1989). Dessertation: Assessment of bookkeeping practices and its relevance. *Journal of Chemical Information and Modeling*, 53(June), 160. <https://doi.org/10.1017/CBO9781107415324.004>

### Modes of Evaluation: Quiz/Assignment/ Seminar/Practical

### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	6	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	3	2	1	--	2	--	2	1	--	2	1	3	--	3
CO2	2	2	2	3	2	--	2	--	2	2	--	2	1	2	--	2
CO3	2	2	1	3	1	--	2	--	2	1	--	2	1	2	--	2
CO4	2	3	2	2	1	--	2	--	2	1	--	2	2	2	--	2

1: strongly related, 2: moderately related and 3: weakly related



	<b>ELECTIVE- PEOPLE CULTURE AND BUILT ENVIRONMENT- IV (ARC2818)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	History of Architecture, Architectural Design – III					
Co-requisites	Theory of Architecture					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in psychological and sociological aspects which are of concern to Architecture. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide students the exposure to understanding society and various built forms produced by society. The course will also provide the students hands-on cultural, sociological and psychological studies of the built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross fertilization with other courses. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on projects. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To understand the basic principles of psychology, sociology and culture of settlement.
- The course intends to study and understand the typical components of city in order to appreciate how these elements contribute to the quality of life of urban communities.
- To familiarize students with decisive strategies that brings inclusivity and equality in the designs of built forms.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Develop a relationship between man and his larger social environment, with special emphasis on aspects that are likely to affect intervention in or creation of, the built environment (predominantly urban)

**CO2:** Develop a language and vocabulary for discussions/ analysis on the sociological/ psychological dimensions of architecture.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Psychology, Sociology and Built Environment</b>            Basic introduction to various critical social aspects; Role of psychology in architecture; Role of sociology in built environment; Determinants of sociology- social structure, social status, social control, social institutions, social mobility; Inclusive Built Environment; Barrier free designs and built environments;            Various case studies related to gender and architecture, community development- community response towards development strategy etc.</p>	L1, L2	8
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	16

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books/References**

- Cragun R.T.(2006). Introduction to Sociology, Wikibooks.
- Giddens, A (2006) Sociology, Polity Press, Cambridge (UK)
- Lynch, K. (1960) The Image of the City, Joint Centre Publication, USA
- Oomen T.K. and Venugopal C.N. (2004), Sociology, Eastern Book Company.
- Porteous, Douglas, J. (1977), Environment Behaviour: Planning and Everyday Urban Life, Addison Wesley
- Sinha A. (2013) “An India for Everyone: A Path of Inclusive Development, Harpercollins

- Steve Barkan (2010), Sociology: Understanding and Changing the Social World, Flat World Reference Books
- Tejchman A. (2016) “The Politics of Inclusive Development”, Palgrave Macmillan.

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE- ECOLOGY, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT - IV (ARC2819)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Environmental Sciences, Building Services-1, Building Services-2					
Co-requisites	Architectural Design, Building Services-3					

### Catalog Description

The objective of this course is to offer opportunities in specialized or advance learning in ecology, environment and sustainable aspects which are of concern to Architecture. The course will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide students the exposure to understanding ecology and various environmental problems faced by settlements. The course will also provide the students hands-on ecological and environmental studies of built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross learning with other courses. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on projects. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### Course Objectives

The objective of this course is

- To understand the basic principles of ecology, environment and sustainable development.
- The course intends to study and understand the different components of city in order to understand how these elements contribute to environment quality.
- To establish the significance of the ecological issues, their impact and initiatives to address the same in the built environs to achieve sustainable development.
- To develop interdisciplinary understanding and sensitivities of future architects.

### Course Outcomes

On completion of this course, the students will be able to

- CO1:** Develop a relationship between man and ecology, will understand critical environmental issues and need to address the m by using advanced technology.

**CO2:** Produce reports and presentation.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Ecology, Environment and Sustainable Development</b>            Basic introduction to ecology; Interrelation between natural and built environment; Importance of environment sustainability in built environment; Energy conservation, renewable sources: wind, solar, geothermal, bio-fuels; Materials minimizing, recycling, reducing energy content, etc; Other environmental issues related to solid waste management, water resources, air quality, storm water drainage etc;            Various case studies related to traditional / vernacular buildings and settlements demonstrating relationship between climate, local material resources and settlement/ building forms.</p>	L1, L2	8
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	16

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books/References

- Bakari, Mohamed El-Kamel (2017). The Dilemma of Sustainability in the Age of Globalization: A Quest for a Paradigm of Development. New York: Lexington Books. ISBN 978-1498551397
- Blewitt, J. (2008). Understanding Sustainable Development. London: Earthscan. pp. 21–24. ISBN 978-1-84407-454-9.
- Fulekar, M. H., Pathak, B., Kale, R. K. (2014) Environment and Sustainable Development' Springer Nature; ISBN-10: 8132211650; ISBN-13: 978-8132211655
- Goudie, Andrew (2000). The Human Impact on the Natural Environment. Cambridge, Massachusetts: This MIT Press. pp. 203–239. ISBN 0-262-57138-2.
- James, Paul (2014). Urban Sustainability in Theory and Practice. doi:10.4324/9781315765747. ISBN 978-1-315-76574-7.
- James, Paul; Magee, Liam (2016). "Domains of Sustainability". In A. Farazmand (ed.). *Global Encyclopedia of Public Administration, Public Policy, and Governance*. Springer.
- Modak, P. (2017) Environmental Management Towards Sustainability, CRC Press, ISBN-10: 9781498796248
- Odum, E. P. (1971). Fundamentals of Ecology (Third ed.). New York: Saunders. ISBN 0-7216-6941-7.

- Porteous, Douglas, J. (1977), Environment Behaviour: Planning and Everyday Urban Life, Addison Wesley
- Thangavel, P., Sridevi, G. (2015) Environmental Sustainability, Springer Nature, ISBN-10: 9788132220558
- Walker, Brian and Salt, David (2006) Resilience Thinking: Sustaining ecosystems and people in a changing world. Island Press. p. xiii. ISBN 978-1597260930.
- Wandenberg, JC (August 2015). Sustainable by Design. Amazon. p. 122. ISBN 978-1516901784

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE - COMPUTER APPLICATIONS AND ADVANCE TECHNOLOGIES – IV (ARC2820)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	Architectural Graphic Skills					
Co-requisites	Architectural Design, Building Materials and Construction Technology					

### **Catalog Description**

The objective of this course is to offer opportunities in specialized or advance learning in computer applications and advance technologies which are of concern to Architecture. The course will generally be conducted in the tutorial mode to encourage exploration and skill developments. The aim of this course is to provide students the exposure to understanding new technological innovations and their applications in field of architecture. The course will also provide the students hands-on experience of new software and applications. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for cross learning with other courses. The course would be conducted through data base creation, analysis, presentation. During the course the students will be working on a live project in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To familiarize students with use of computers in architecture and with impact of Information Technology on architectural knowledge system and practice.
- To critically explore current advancements in smart technologies available for sustainable built environments.
- To sensitize students about strategies for innovations by using latest technologies.
- To develop interdisciplinary understanding and sensitivities of future architects.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Students will be exposed to the latest software and computer applications available in the field of architecture.

**CO2:** Students will be aware of new advanced technologies available for architecture.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to computer applications and advance technologies</b></p> <p>Basic introduction to information technology in architecture; Introduction to smart technologies in field of architecture; Applications of information technology in architecture; applications of smart technologies in architecture;</p> <p>Case studies related to use of information technology and advance technology in architecture and built environment. .</p>	L1, L2	9
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of project; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L3, L4, L5, L6	18

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books/References

- Ching, F. D. (2009) Architectural Graphics, John Wiley and Sons
- D'Ulizia, A., Ferri, F., Grifoni, P., & Guzzo, T. (2010). Smart homes to support elderly people: innovative technologies and social impacts. In *Pervasive and Smart Technologies for Healthcare: Ubiquitous Methodologies and Tools* (pp. 25-38). IGI Global.
- Deakin, Mark; Al Waer, Husam (2011). "From Intelligent to Smart Cities". *Journal of Intelligent Buildings International: From Intelligent Cities to Smart Cities*. 3 (3): 140–152.
- Graham, S.; Marvin, S. (1996). *Telecommunications and the city: electronic spaces, urban place*. London: Routledge. ISBN 9780203430453.
- Kedar, Seema (2009). *Database Management System* Technical Publications. ISBN 9788184316049.
- Komninos, Nicos (22 August 2013). "What makes cities intelligent?". In Deakin, Mark (ed.). *Smart Cities: Governing, Modelling and Analysing the Transition*. Taylor and Francis. p. 77. ISBN 978-1135124144
- McLaren, Duncan; Agyeman, Julian (2015). *Sharing Cities: A Case for Truly Smart and Sustainable Cities* MIT Press. ISBN 9780262029728.
- Peris-Ortiz, Marta; Bennett, Dag R.; Yábar, Diana Pérez-Bustamante (2016). *Sustainable Smart Cities: Creating Spaces for Technological, Social and Business Development*. Springer. ISBN 9783319408958.



- Reynolds, George (2009), *Ethics in Information Technology*, Cengage Learning, ISBN 978-0-538-74622-9
- Silberschatz, Abraham (2010). *Database System Concepts* McGraw-Hill Higher Education. ISBN 978-0-07-741800-7
- Wagginton, M., Harris, J (2002) *Intelligent Skins*, Reed Elsevier, Oxford
- Wang, S. (2010) *Intelligent Buildings and Building Automation*, Spon Press, USA, ISBN10:0-415-47570-8

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	2	1	1	2	1	1	2	-	2	-	-	1	1
CO2	2	3	1	2	1	1	2	3	3	1	-	1	-	-	1	1

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Ninth Semester

	<b>PRACTICAL TRAINING (ARC2937)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	0	0	0	0	14
Pre-requisites/Exposure	Architectural Design – VIII					
Co-requisites	NA					

### Catalog Description

The aim of the 'Practical Training' is to enable the students to gain the kind and range of practical experience which will prepare them for their likely responsibilities, immediately after qualifying B. Arch. Course. The trainee student has the responsibility to use his/her own initiative in making the best use of the opportunities which he gets during training period and prepare himself/herself for profession. The core of the professional training is architectural one. Student is expected to get well versed with the realm of architectural discipline ranging from generation of idea, preparation of drawings to the final execution of design on site. A Training Manual shall provide the details of the expected outline of work and other procedures.

• **Mandatory Requirements:** Student shall have to undergo Professional Training for a period of at least 06 months

### Course objectives

The objective of this course is

- To expose the students to the practical environment and works by working under an Architect.
- To gain a practical knowledge and involved in all aspects of office works.
- To design for situation specific problems.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Formulate and theorize the principles into practices.

**CO2:** Apply the professional aspects of an architecture office/company and the multiple issues in conception, preparation and execution of project on a site.

**CO3:** Develop a skill that helps to adapt to fit special requirements.

**Examination Scheme:**

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ				Total
I	II									
0	0	0	0	0	0	1400	1400	1400	14	-

CT: Class Test; TA: Total Assessment; A: Attendance

## Syllabus - Tenth Semester

	<b>ARCHITECTURAL THESIS (ARC2037)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	6	10	0	18
Pre-requisites/Exposure	Professional Practice- II					
Co-requisites	Architectural Design – VIII					

### Catalog Description

The aim of this course is to provide an opportunity to the students to handle a complete design project. Project Thesis is the final stage of learning Architectural Design. With the help of a thesis project, students are expected to demonstrate the understanding of a systematic design process which includes identification of project requirements, site study and analysis, case studies, programming, schematic design and Design Development. It provides the students with an opportunity to culminate the nine semesters of architectural education by demonstrating the body of knowledge and skills gained during their education and the professional training.

### Course objectives

The objective of this course is

- To prepare a student to independently handle and present all aspects of an architectural design, from its evolution to final solution in totality.
- To understand the importance of the evolutionary stages of a design process and various techniques required for a successful presentation of an architectural design.
- To develop in students the ability to handle specific aspects / thrust area of design relevant to the topic.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Design a Thesis project responsive to the contextual and program requirements.

- CO2:** Evaluate data and information gathered from primary and secondary data collection
- CO3:** Combine the systematic methodology from various stages of study and analysis in design process towards culmination of an informed design.
- CO4:** Produce detail estimation and specification data of a building unit.
- CO5:** Demonstrate the ideas clearly using detailed physical model.

**Text Books/References:**

1. Ablamowicz, R. (2007). *An abstract of the thesis of. Young* (Vol. c, pp. 105–106).
2. Agarwal, S. S., Yadav, P. P., Chavali, K. H., & Kumar, L. (2011). How to write a thesis? *National Journal of Physiology, Pharmacy and Pharmacology*, 1(2), 86–90. [https://doi.org/10.5005/jp/books/12140\\_6](https://doi.org/10.5005/jp/books/12140_6)
3. Evans, D., Gruba, P., & Zobel, J. (2014). *How to Write a Better Thesis. How to Write a Better Thesis*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-04286-2>
4. Vasaiely, P. (2010). Bachelor Thesis. *Applied Sciences*, 16(February), 1–106. <https://doi.org/10.1053/j.sodo.2009.12.005>

**Modes of Evaluation: Quiz/ Case Study/ Literature Study/ Presentation/ Report Submission**

**Examination Scheme:**

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
P			R	Total	ESE	ESJ	Total			
I	II	III								
200	200	200	200	800	0	1000	1000	1800	18	NA

P: Presentation; R: Report; ESE: End Semester Examination; ESJ: End Semester Jury

	<b>PROFESSIONAL PRACTICE (ARC2001)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	4	0	0	0	4
Pre-requisites/Exposure	Town Planning					
Co-requisites	Architectural Thesis					

### **Catalog Description**

This course aim is to provide the foundation, knowledge and skills needed to professional practice. It is designed to build understanding of the complex interactions and uncertainties of the professional practice. It provides students with the essential knowledge components of role of COA, IIA, Uttar Pradesh architect association, Architects Act 1972, Tendering & Contract and Valuation. It also develops an appreciation of the skills and tasks inherent in development Conditions of engagement of Architect – Duties, Responsibilities, Liabilities of the profession, scale of charges, mode of payment etc. Clauses governing conduct of professional practice

### **Course Objectives**

The objective of this course is

- To understand the role of Professional bodies.
- To acquaint the students with the responsibility, scale of charges and Architect's conduct in Architectural practice.
- To understand the office and administration of an Architect's office, Tenders and contracts.
- To analyze judicial process involved in arbitration.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Gain a comprehensive understanding of the Professional Practice in India.

**CO2:** Explain different role of Architect's Act 1972 in professional conduct and all the work related to scales of charges.

**CO3:** Compare and float tenders and contract for the Architectural project.

**CO4:** Compare difference between Arbitration, Conciliation and Mediation.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Role of professional bodies</b> Role of different bodies i.e. COA, IIA, Uttar Pradesh Architect Association, their working constitution and bye-laws, categories of membership and election procedures.</p>	L1, L2	06
<p><b>MODULE 2: Architect's Act 1972 &amp; Office and administration</b> Detail study of the Act and procedures of membership. Office set up and administration, Filing and recording, nature of partnership, registration of firm and dissolution, copy rights of drawings, practice procedures and conduct etc. Conditions of engagement of Architect, discuss the Duties, Responsibilities, Liabilities of the Architect profession, Fee (scale of charges), mode of payment etc. Clauses governing conduct of professional practice.</p>	L1, L2,	12
<p><b>MODULE 3: Tendering and Contract</b> Tendering - Types of tenders and tender documents, tender drafts notices, Inviting Tenders, Procedure of opening and selection process and report of owner. Contract – Types, conditions of contract – Earnest money, Security deposit, Retention money, Mobilization fund, Bank Guarantee, Architect's Instructions, Defects, Certificates and payments, Penalties, Insurance, Liquidated damages, Termination of contract, breach of contract.</p>	L1, L2, L3	15
<p><b>MODULE 4: Arbitration</b> Introduction, Techniques, elements and factors affecting valuation, Methods, Types – renewal or lease/ extension of lease, standard rent, easement right, dilapidation, Property valuation techniques, circle rate analysis, comparable cost of scale. Share knowledge on the concept of property purchase and mortgage, Goods and Service Tax, Capital gain tax, wealth tax, property tax and other taxes etc. Arbitration, Arbitrator, nature of arbitration, appointment, conduct, powers and duties of arbitrator and umpire amended from time to time. Procedure of arbitration. Mediation &amp; Reconciliation</p>	L1, L2, L3	15

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Chitkara K.K. (1998). *Construction Project Management*, New Delhi: Tata McGraw- Hill Compony Limited
- Deobhakta Madhav, Deobhakta Meera (2007), *Architecture Practice in India*, Delhi: Council of Architecture
- Gazette of India (1972). *The Architects Act, 1972*, Delhi

### Reference Books

- Patil,B.S.(2015), *Civil Engineering Contracts and Estimates*,Delhi:Orient Blackswan Private Ltd
- Ramaswamy, (2016), *Contract and their managment*, New York: LexisNexis

### Modes of Evaluation: Assignment/ Written Examination

#### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	50	0	50	100	4	3

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	--	--	--	--	--	--	--	--	--	1	1	--	--	--	1
CO2	--	--	--	--	--	--	--	--	--	1	1	--	--	--	1
CO3	--	--	--	--	--	--	--	--	--	1	1	--	--	--	1
CO4	--	--	--	--	--	--	--	--	--	1	1	--	--	--	1

1: strongly related, 2: moderately related and 3: weakly related



	<b>CAREER DEVELOPMENT (ARC2002)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	2	0	0	0	2
Pre-requisites/Exposure	Professional practice					
Co-requisites						

### Catalog Description

The aim of this course is to enable students to understand future after completing architecture study. It also includes knowledge the legal and regulatory body. The subject will be taught in a way so that they are able to build a concrete portfolio, and assignments for the subject will be linked to the design presentation exercises to achieve higher level of representation in real world.

### Course Objectives

The objective of this course is

- To introduce the scope after completing architecture.
- To understand the functions of various national and international regulatory bodies.
- To study the cyber security.
- To provide portfolio development.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain career after completing architecture.

**CO2:** Define national and international regulatory bodies.

**CO3:** Explain cyber security and its role in architectural field.

**CO4:** Understanding of portfolio development.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction to area of specialized course</b> Architecture, Scope for architecture stream, careers in govt. sector and private sector for architects, higher education in different fields (i.e. planning, construction, management, conservation, software development and analysis etc.) Research in different specialized area.	L1, L2, L3	06

<p><b>MODULE 2: International Architecture Practice and role of regulatory</b> Role of different bodies i.e. COA, IIA, their working constitution and bye-laws, categories of membership and election procedures. Introduce to the relevant Act and procedures of membership. Conditions of engagement of Architect, discuss the Duties, Responsibilities, Liabilities of the Architect profession, Fee (scale of charges), mode of payment etc.</p>	L1, L2, L3	06
<p><b>MODULE 3: Cyber security</b> Introduction to information systems, Need for Information security, Threats to Information Systems, Information Assurance, Cyber Security, and Security Risk Analysis. Security Policies, WWW policies, Email Security policies, Policy Review Process-Corporate Policies, Information Security Standards-ISO, IT Act, Copyright Act, Patent Law, IPR. Cyber Laws in India; IT Act 2000 Provisions, Intellectual Property Law: Copy Right Law, Software License.</p>	L1, L2, L3	06
<p><b>MODULE 4: Portfolio development</b> Analyse, critically evaluate and articulate assessments of their own design works. Composition, Colour schemes, Sizes, Sequences, Software, Logo and style development</p>	L1, L2, L3	06

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### Text Books

- Charles P. Pfleeger, Shari LawerancePfleeger, “Analysing Computer Security ”, Pearson Education India.
- Dr. Surya PrakashTripathi, RitendraGoyal, Praveen kumarShukla ,”Introduction to Information Security and Cyber Law” Willey Dreamtech Press.
- Schou, Shoemaker, “ Information Assurance for the Enterprise”, Tata McGraw Hill. CHANDER, HARISH,”
- V.K. Pachghare, “Cryptography and information Security”, PHI Learning Private Limited, Delhi India.
- Chitkara K.K. (1998). Construction Project Management, New Delhi: Tata McGraw- Hill Compony Limited
- Deobhakta Madhav, Deobhakta Meera (2007), Architecture Practice in India, Delhi: Council of Architecture
- Gazette of India (1972). The Architects Act, 1972, Delhi
- Gutman, R., & Haviland, D. (1992). The Architect’s Handbook of Professional Practice. Journal of Architectural Education (1984-), 45(2), 122. <https://doi.org/10.2307/1425280>

### References

- Baka, J. (2013). The Political Construction of Wasteland: Governmentality, Land Acquisition and Social Inequality in South India. Development and Change, 44(2), 409–428. <https://doi.org/10.1111/dech.12018>

- LARR. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, The Gazette of India Extraordinary § (2013). Ministry of Law and Justice, Government of India. Retrieved from [https://dolr.gov.in/sites/default/files/Right to Fair Compensation and Transparency in Land Acquisition%2C Rehabilitation and Resettlement Act%2C 2013.pdf](https://dolr.gov.in/sites/default/files/Right%20to%20Fair%20Compensation%20and%20Transparency%20in%20Land%20Acquisition%20Rehabilitation%20and%20Resettlement%20Act%202013.pdf)
- Narain, V. (2009). Growing city, shrinking hinterland: Land acquisition, transition and conflict in peri-urban Gurgaon, India. *Environment and Urbanization*, 21(2), 501–512. <https://doi.org/10.1177/0956247809339660>
- Raghuram, G., & Sunny, S. (2015). The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Amendment) Ordinance, 2015. Research and Publications Of Indian Institute of Management, 2013(July), 51.
- Requirements, D., & Amendment, T. (2010). the Gazette of India. *DisClosure*, 2011(2), 1–216.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Evaluation Scheme							Total marks	Credits	Duration of Exam (hr)	
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ				Total
I	II									
10	10	25	5	50	0	50	50	100	2	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	--	--	--	--	1	--	--	--	2	3	1	3	--	1	2
CO2	--	--	--	--	--	2	--	--	--	1	1	1	3	--	1	2
CO3	--	--	--	--	--	1	--	--	--	2	1	1	3	--	1	2
CO4	--	--	--	--	--	2	--	--	--	1	2	1	3	--	1	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE - UNDERSTANDING CULTURAL LANDSCAPES FOR URBAN RENEWAL AND CONSERVATION (ARC2003)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure						
Co-requisites						

### **Catalog Description**

The aim of this course is to understand the definition and concept of Culture Landscapes for urban renewal and conservation. It explain the culture of landscape to renewal/redevelopment of the existing environment and its surrounding to sustain the better quality of life though proper plan or documentation. This course has explained about the cultural heritage conservation particularly heritage site. It also deals about the urban area development through the literature study of Renewal, Redevelopment Revitalization and Rejuvenation. In this course, development approaches are comprises of social, environment and economy dimensions. The learning and outcome of this course is exploring in the field of Culture Landscapes, Heritage site and Urban Environment aspects in order to plan for development. The students must learn through literature review of research articles, professional documents, books related to urban renewal. It needs to carry out the field work and preparing the development report in this particular subject.

### **Course Objectives**

The objectives of this course are

- To assess the urban renewal/redevelopment approaches at old city and historical sites in the context of having better access to services and sustainable urban development.
- To critically analyze the best practices of urban re-development for furthering utilization and formulation of a redevelopment plan.

### **Course Outcomes**

At the end of this course, students will be able to

**CO1:** Digest and apply the knowledge of development approaches such as urban renewal/redevelopment/revitalization/rejuvenation.

**CO2:** To prepare the detail report and presentation on a given project related to urban renewal and urban re-development.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction of Cultural Landscape for Urban Renewal and Conservation.</b> Introduction to definition and concept of Cultural Landscape, Urban Renewal, and Conservation, Development Approaches of Old City, A brief history of the landscape concept, Principle for Conservation and Renewal of decay areas within City Area, Principles and methods for the assessment of the cultural landscape, Landscape resources, management and planning structure, Mechanism for Development of Historical Area includes the Environment, Social, Culture and Economic aspect; Infrastructure and Services Facilities System of Old Area within City. Governance System and Planning aspect to build new Plan. Case Studies of various Plan and Documents for Renewal and Redevelopment in Developed Countries and Development Nations particularly Indian cities context.</p>	L1, L2	12
<p><b>MODULE 2: Project Work</b> Selection of Study Areas, Literature Review, Formulation of Aim and Objectives through Proper Scientific Approaches, Collection of data through various techniques such as primary and secondary sources; Conducting survey (Focus Group Discussion, Households Survey etc), Documentation; Develop the data Base to Analyze the relevant by using the advance software; Analyze the Qualitative and quantitative approaches and formulating the new plan through scientific manner and; Report writing and presentations.</p>	L4, L5, L6	24

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation

### Text Books

- Ken Taylor., The Historic Urban Landscape Paradigm and Cities as Cultural Landscape, Landscape Research, 41 (4): 1-10, 2016
- R. Pickard., Management of European Historic Centres, E&FN SPON, Londra 2000

- N. Mitchell, Rössler M., Tricaud P.M., World Heritage Cultural landscapes, A handbook

## References

- C. Sauer, The Morphology of Landscape, University of California Publications in Geography, 1925
- Lawrence W.C. Lai., Frank T. Lorne., Sustainable Urban Renewal and Built Heritage
- Conservation in a Global Real Estate Revolution, Sustainability., 11 (580), 2019

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Evaluation Scheme								Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment						
CT		TA	A	Total	ESE	ESJ	Total			
I	II									
10	10	25	5	50	0	50	50	100	3	0

CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

## CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE: SMART CITIES AND SMART TECHNOLOGIES (ARC2004)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure						
Co-requisites						

### Catalog Description

The aim of this course is to introduce the students to smart cities concepts and solutions with their specific planning needs and priorities and the implication on development in these areas. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course will be on **exploring the role of technology and data in cities, and learn how you can participate in the creation of smart cities**. This course will provide the student's hands-on experience on smart city planning that required a different planning process in a built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for interdisciplinary learning. The course would be conducted through literature survey, case studies, site visits, and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### Course Objectives

The objective of this course is

- To investigate, analyze and explore Smart City concepts and solutions important for urban development sectors
- To learn about state-of-the-art strategies for effectively managing the transition from legacy infrastructures to smart urban systems.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Comprehend the concept, challenges and solutions for smart cities planning

**CO2:** Prepare the detail report and presentation on a given project related to Special area planning.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to Smart Cities Concept and analysis of smart technologies</b> Introduction to smart cities, the city as a system of systems, smart citizens, Infrastructure, technology and data, Innovation and enterprise, smart leadership and strategy, standards and capacity building, smart measurement, and learning. Case Studies of various smart cities in Indian and international context.	L1, L2	12
<b>MODULE 2: Project Work</b> Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.	L4, L5, L6	24

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation

#### Text Books

- Smart Cities & Urban Development in India, N. Mani, New Century Publications
- Smart Cities Unbundled, Sameer Sharma, Bloomsbury India
- The Smart City Transformations: The Revolution of The 21st Century, Amitabh Satyam, Bloomsbury India
- Introduction to Smart Cities, Anil Kumar, Pearson India

#### References

- Smart Technologies, K. Worden, World Scientific Publishing Co Pte Ltd
- Smart Technologies for Smart Governments, Manuel Pedro Rodríguez Bolívar, Springer Publications
- Advanced Technology for Smart Buildings, James M. Sinopoli, Artech House Publishers

#### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Evaluation Scheme							Total Marks	Credits	Duration of Exam (hr)
Internal Assessment				External Assessment					
CT		TA	A	Total	ESSE	ESJ			
I	II								



10	10	25	5	50	0	50	50	100	3	0
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CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELECTIVE: TRANSIT ORIENTED DEVELOPMENT (ARC2005)</b>	L	T	S	P	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure						
Co-requisites						

### Catalog Description

The aim of this course is to introduce the students to transit oriented development concepts and solutions with their specific planning needs and priorities and the implication on development in urban transportation sectors. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course will be on **exploring the role of TOD and learn how this can be implemented.** This course will provide the students hands-on experience on planning for TOD that required a different planning process in a built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for interdisciplinary learning. The course would be conducted through literature survey, case studies, site visits, and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### Course Objectives

The objective of this course is

- To investigate, analyze and explore TOD concepts and solutions important for urban transportation sectors
- To develop interdisciplinary understanding and sensitivities of future planners.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Comprehend the concept, challenges and solutions for TOD planning

**CO2:** Prepare the detail report and presentation on a given project related to TOD planning.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction and Planning of TOD</b> Introduction to TOD, need of transit-oriented development, Factors driving the trend, components of TOD, Principles, Benefits, government policies, Case Studies of various TOD's in Indian and international context.	L1, L2	12
<b>MODULE 2: Project Work</b> Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.	L4, L5, L6	24

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation

### Text Books

- Transit Oriented Development: Making it Happen (Transport and Mobility), John L. Renne, Carey Curtis, Routledge; 1 edition (25 June 2009)
- Transit Oriented Development and Sustainable Cities: Economics, Community and Methods (Transport, Mobilities and Spatial Change), Richard D. Knowles , Fiona Ferbrache, Edward Elgar Pub (June 28, 2019)
- Financing Transit-Oriented Development with Land Values: Adapting Land Value Capture in Developing Countries (Urban Development), Hiroaki Suzuki , Jin Murakami , Yu-Hung Hong , Beth Tamayose , World Bank Publications (15 January 2015)

### References

- Transit Oriented Development: Guide for Practitioners, Queensland. Department of Infrastructure and Planning, Queensland Department of Infrastructure and Planning, 2010
- Urban Transformation: Transit Oriented Development and the Sustainable City, by Ronald A. Altoon , James C. Auld, Images Publishing Dist Ac (November 16, 2011)

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

<b>Evaluation Scheme</b>							<b>Total Marks</b>	<b>Credits</b>	<b>Duration of Exam (hr)</b>
<b>Internal Assessment</b>				<b>External Assessment</b>					
<b>CT</b>		<b>TA</b>	<b>A</b>	<b>Total</b>	<b>ESE</b>	<b>ESJ</b>			
<b>I</b>	<b>II</b>								

10	10	25	5	50	0	50	50	100	3	0
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CT: Class Test; TA: Total Assessment; A: Attendance; ESE: End Semester Examination; ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

# Ordinance- Examination Rules

## Bachelor of Architecture

### Amity School of Architecture and Planning

*Following rules are in addition to regulations for conduct of examinations & Scheme of Evaluation of Amity University Haryana which shall be applicable only for B.Arch Course (Batch 2018-2023 onwards).*

#### 1. QUALIFYING STANDARDS

1.1. Progressive marks refer to the marks given to a student on a continuous basis during a semester by the concerned subject teacher/teachers.

1.1.1. In the case of subjects which are mainly **studio based** as per the scheme of teaching and examinations, the progressive marks shall be the total of marks given to the various drawings (plates) submitted from time to time by a student on tracing sheets/ butter sheets/drawing sheets or computer printouts. However, if the subject teachers so desire, they shall give some weight age for time problems/tests in these subjects.

1.1.2. In the case of subjects which are mainly **lecture based** as per the scheme of teaching and examinations, the progressive marks shall be based on the average of two tests conducted normally at the end of 8<sup>th</sup> and 12<sup>th</sup> weeks of each semester. Provided that, the teacher may give assignments instead of tests which may include sketching, book reviews, write-ups etc.

1.1.3. In the case of subjects which are mainly **practical based** as per the scheme of teaching and examinations, the progressive marks shall be based on the assignments submitted by the students. A minimum of two assignments per semester shall be given.

1.1.4. In all the above mentioned three cases, viz studio based, lecture based and practical based subjects:

- The concerned teacher shall give a reasonable opportunity to the student to improve his/ her progressive marks, for example by re-doing the assignments or taking an additional test etc, within the time frame of the given semester with approval of HOD/HOI.
- The relevant records and submissions of students which have been assessed for progressive marks shall be produced as and when they are sought by the university within 12 months, after 12 months that no records shall be retained/ produced.

- 1.2. If a candidate fails to secure a **minimum of 50% of marks** in progressive marks in any subject, he /she shall not be eligible to take up theory/viva voce/end term examination in that particular subject.
- 1.3. It shall be the responsibility of concerned Head of the Architecture Department/Principal to implement clause “1.2” in the event of an ineligible candidate inadvertently being allowed to appear for the theory/ viva voce /end term examination, the result of the concerned examination shall be considered as null and void.
- 1.4. Such candidates shall correct, improve, redo the concerned works on the advice of subject teacher and re- submit them during subsequent semester of the next year in order to secure the minimum required progressive marks in that subject.
- 1.5. Once a candidate secures ‘minimum’ or ‘more than the minimum’ progressive marks in any subject, the marks shall be made permanent and shall not be changed under any circumstances.
- 1.6. To pass a subject, a candidate shall secure a minimum of 50% marks in Progressive marks and 50% marks in the end term examination (Theory examination/ Practical examination/ viva voce examination/ Total marks) ie Internal Marks: External Marks: Total marks :: 50:50:50.
- 1.7. Candidates who do not fulfil above cited **clause no. 1.6** shall be deemed to have failed in that subject and have to re-appear for the Theory examination / practical examination or viva voce examination in which he/she has secured less than the minimum prescribed marks.
- 1.8. In B. Arch course a minimum of 5.00 SGPA shall be secured by the student to be eligible for the award of degree.

## 2. THESIS EXAMINATION

- 2.1. The ‘Thesis’ of every student in the final semester shall be evaluated on thesis presentation by the student through viva-voce examination by the panel of the jury in accordance with the Regulations issued separately.
- 2.2. The jury shall include two (1:20) external jury members and one internal member (Thesis Coordinator) from the faculty, in addition to the Chairman/HOD/HOI. Out of the four jury members, at least three must be present to complete the proceedings of the jury.
- 2.3. A student who fails in the thesis evaluation shall be allowed to resubmit the modified thesis after a minimum period of two months with due approval by the management, Amity University Haryana.

## 3. PRACTICAL TRAINING

- 3.1. Each student shall be required to proceed on ‘Practical training’ for the IX semester after appearing at the VIII semester examination. The HOI/ Chairman ASAP, Amity University Haryana approve the office of the ‘Practical training’ for the student.

- 3.2. The marks for Practical training shall be awarded to each student in accordance with the Regulations and guidelines issued by the Training Coordinator in consultation with HOI ASAP, Amity University Haryana.

#### **4. PROMOTION RULES**

- 4.1. A Student not satisfying the requirement of qualifying standards, at any semester, as per the Clause 1.6, shall be detained from appearing at the semester examination for that particular subject.
- 4.2. Such a student shall have to repeat the particular subject, as a ex-student student with the next batch of students.
- 4.3. A student satisfying all the standards as provided in Clause 1 shall be declared to have 'Passed' the semester examination.
- 4.4. A student not satisfying all the criteria of qualifying standards of Clause 1 in conjunction with the provisions of Clause 4.2, but failing in any number of subjects of both the semesters of a class taken together shall be declared to have been 'Promoted With Back-Papers' (PBP) and, shall be governed by Clause 5. A student so declared as PBP shall have to clear the back papers, as and when the examination of the concerned semester is held next.
- 4.5. A student not satisfying all the criteria of qualifying standards of Clause 1.1 in conjunction with the provisions of Clause 4.2, and has invoked the provisions of Clause no. 6, shall be declared as 'Promoted with Grace marks' (PWG), and shall be promoted to the next higher class.
- 4.6. The students who are not covered by provisions of Clause 4.1 to 4.5 shall be declared to have 'Failed'. Such students shall be required to repeat both the semesters of the said class, either as a 'regular student' or as an 'ex-student', in accordance with the Clause 5 and 6.

#### **5. PROMOTION UNDER CARRY- OVER SYSTEM**

- 5.1. A candidate covered under Clause 4.4 shall become eligible for provisional promotion to the next higher class of the course and shall get another chance to clear the said 'Back-Papers' in the next examination of the concerned semester under the carry-over system.
- 5.2. On failing again in any of the 'Back-papers' examination of a semester, the provisional admission granted to the concerned student in the higher class shall automatically stand cancelled and he/she shall have to clear the 'Back-papers' as an 'ex-student' or as a 'regular student', in accordance with the Clause 6.
- 5.3. Marks obtained by a student to clear his/her back paper shall replace the original marks, secured earlier by the student only to the extent of the minimum qualifying marks for computation of his/her result.

## **6. EX-STUDENTSHIP**

- 6.1. A student opting to clear his/her examinations as an ex-student shall be required to inform the college, in writing, within 15 days of start of the next academic session.
- 6.2. An ex-student shall be required to appear at the 'Theory' and 'Practical /viva-voce' examination of all the subjects of both the semesters of the concerned class. However, the marks, for the 'Mid Term Examination' of all the subjects in the earlier regular attempt shall be retained as obtained by him/her.
- 6.3. If a student opts to repeat the semester as a regular student, the new marks awarded to him for 'Mid Term Examination' shall replace the old marks obtained by him in the earlier attempt.

## **7. GRACE MARKS**

- 7.1. Grace Marks shall be allotted to the students within the policy directives of the Amity University Haryana.

## **8. MIGRATION**

- 8.1. Migration of students from one Institute to other shall not be allowed unless it falls within the policy directives of the Amity University Haryana.

## **9. COURSE DURATION**

- 9.1 Minimum duration of the course will be 5 years.
- 9.2 If any students fail to clear all the subjects as per clause 9.1, students have to clear remaining subjects in N+2 years where N will be the minimum course duration as per Amity University Gurgaon guidelines.



## **Bachelor of Planning**

**FLEXILEARN**

-Freedom to design your degree



### **Programme Structure**

**Curriculum & Scheme of Examination**

**2022**

**AMITY UNIVERSITY HARYANA**

**GURUGRAM**

## Preface

The Bachelor of Planning Course at Amity University Haryana is one of the few courses in our country which aims to impart basic skills that would help students later in their careers to serve in various professional capacities in planning, development and management agencies in the public sector as well as private consultancy organizations. During the programme, the students are also equipped with the knowledge of basic theories, techniques, and design concepts so that they can assume their assigned professional roles as members of multi-disciplinary teams for survey, analysis and plan preparation be it in the area of urban planning, development and management regional planning, housing, transport planning, infrastructure planning, environmental planning, design, conservation or in other related disciplines.

The course curriculum of this programme is spread over eight semesters during which time students attain proficiency in designing and managing projects of all magnitudes from micro level unit design to the macro level regional development planning supplemented with 12 weeks of off-campus professional work in a planning office. The programme culminates in the eighth semester in a thesis presentation whereby a student is trained in research methodologies.

## Programme Outcomes

**PO1. Planning knowledge:** Apply the fundamentals knowledge of physical, socio-economic, environmental, legal and institutional framework to the solution of complex problems at urban/regional level.

**PO2. Problem analysis:** Identify, formulate, research literature, as well as analyze complex urban/regional planning problems and reaching substantiated/concrete conclusions.

**PO3. Design/development of solutions:** Planning/Design solutions for various urban/regional planning problems that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including data analysis and interpretation as well as synthesis of the information to provide valid conclusions.

**PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern planning, statistical and IT tools (AutoCAD, SPSS, SDI and GIS), including prediction and modeling to complex planning activities with an understanding of the limitations.

**PO6. The Planner and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional planning practice.

**PO7. Environment and sustainability:** Understand the impact of the professional planning solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the planning practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively on complex planning activities with the planning professionals and with society at large, such as, being able to comprehend and write

effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11. Project management and finance:** Demonstrate knowledge and understanding of the planning and development principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of contemporary changes.

### **Program Specific Outcomes**

**PSO1.** Comprehend knowledge based on planning theories, social, political, economic, environmental, financial, legal and ethical spheres of urban/regional planning.

**PSO2.** Demonstrate the use of contemporary software like AutoCAD and Geo- Informatic System (GIS) in spatial planning with respect to physical and social infrastructure, traffic and transportation.

**PSO3.** Analyse and evaluate various dimensions and emerging challenges of Urban settlements/ Regions, comprehending their problems as well as evolving measures to provide alternate solutions in a planned manner.

**PSO4.** Apply the principles of soft skills like creative thinking, team building, leadership and decision making in career development.

PSO1			PSO2		PSO3		PSO4	
Comprehend knowledge based on planning theories, social, political, economic, environmental, financial, legal and ethical spheres of urban/regional planning.			Demonstrate the use of contemporary software like AutoCAD and Geo-Informatics System (GIS) in spatial planning with respect to physical and social infrastructure, traffic and transportation.		Analyze and evaluate various dimensions and emerging challenges of Urban settlements/ Regions, comprehending their problems as well as evolving measures to provide alternate solutions in a planned manner.		Apply the principles of soft skills like creative thinking, team building, leadership and decision making in career development.	
1	2	3	4	5	6	7	8	9
<b>Basic Planning Courses</b>	<b>Planning Fundamental Courses</b>	<b>Inter-disciplinary domain</b>	<b>Technical Planning</b>	<b>Spatial Planning/ Design</b>	<b>Development Plan Preparation</b>	<b>Management/Governance Courses</b>	<b>NTCC Courses</b>	<b>Value added courses</b>
Planning Theory – I & II	Fundamentals of Urban and Regional Planning	Elements of Economics	Traffic and Transportation Planning – I & II	GIS Studio Course/Field Practice	Planning and Design Lab – I	Metropolitan Planning, Development and Management	Training Seminar – I	Human Values in Planning
Planning Communication	Statistical and Quantitative Methods in Planning	Planning Legislation I & II	Techniques of Planning – I & II	GIS for Planning I & II	Planning and Design Lab – II	Planning Practice I & Planning Practice II	Training Seminar – II	Foreign Language –I, II, III, IV, V, VI & VII
Demography and Urbanization	Housing and Community Planning	Environmental Studies-I & II	Planning and Management of Utilities and Services	Land Economics and Locational Theory	Planning and Design Lab – III	Planning and Management of Informal Sector		Behavioral Science –I, II, III, IV, V, VI & VII
Ecology, Environment and Resource Development and Management	Regional Planning and Management	Environment Planning	Technical Report Writing	Site and Land Development	Planning and Design Lab – IV	Project Formulation, Appraisal and Management		Communication Skills-I, II, III, IV, V, VI & VII
Basic Computer Applications	Metropolitan Planning, Development and Management	Introduction to social sciences			Planning and Design Lab – V	Urban Governance		Professional Elective I
	Cities in History				Planning and Design Lab – VI	Urban Finance		Professional Elective II
					Planning and Design Lab – VII			Professional Elective III
					Planning Thesis			Professional Elective IV

## **PROFESSIONAL TRAINING / SUMMER INTERNSHIP**

Students must undergo a Professional training during their summer break after second semester. They will need to submit their professional training / summer internship report immediately at the onset of third semester in first week of August. Student will have to present a seminar on the same which would be evaluated by the Jury.

**BACHELOR OF PLANNING  
PROGRAMME STRUCTURE 2022**

**FIRST SEMESTER**

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN2101	Fundamentals of Urban and Regional Planning	3	-	-	-	3
PLN	Techniques of Planning I	2	1	-	-	3
PLN2104	Statistical and Quantitative Methods in Planning	2	1	-	-	3
PLN	Basic Computer Applications	-	2	-	-	2
PLN	Technical Report Writing	1	1	-	-	2
PLN2107	Planning and Design Lab-I (Area Appreciation and Space Perceptions)	-	-	10	-	10
<b>Open Electives</b>						
LAN2151	Foreign Language-I French-I	3	-	-	-	3
LAN2152	German-I					
LAN2153	Spanish-I					
LAN2154	Russian-I					
LAN2155	Chinese-I					
LAN2156	Portuguese-I					
LAN2157	Korean-I					
LAN2158	Japanese-I					
LAN2159	Hindi-I **					
CSS2152	English-I *	1	-	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	-	1
ENV2151	Environmental Studies-I*	2	-	-	-	2
	<b>TOTAL</b>					<b>30</b>

\*\* Hindi as Foreign Language for Foreign National Students.

**SECOND SEMESTER**

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN	Cities in History	2	-	-	-	2
PLN	Geo Informatics for Planning-I	2	1	-	-	3
PLN	Planning Communication	1	1	-	-	2
PLN	Site and Land Development	2	1	-	-	3
PLN	Introduction to Social Sciences	3	-	-	-	3
PLN2208	Planning and Design Lab-II (Site Planning and Urban Neighbourhood Planning)	-	-	10	-	10
<b>Open Electives</b>						

LAN2251	Foreign Language – II French- II	3	-	-	-	3
LAN2252	German-II					
LAN2253	Spanish-II					
LAN2254	Russian-II					
LAN2255	Chinese-II					
LAN2256	Portuguese-II					
LAN2257	Korean-II					
LAN2258	Japanese-II					
LAN2259	Hindi-II					
CSS2252	English-II*	1	-	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	-	1
ENV2251	Environmental Studies-II*	2	-	-	-	2
	<b>TOTAL</b>					<b>30</b>

<b>THIRD SEMESTER</b>						
<b>Course Code</b>	<b>Course Title</b>	<b>Lectures (L) Hours per week</b>	<b>Tutorial (T) Hours per week</b>	<b>Studio (S) Hours per week</b>	<b>Practical (P) Hours per week</b>	<b>Total Credits</b>
PLN2301	Planning Theory-I	3	-	-	-	3
PLN2303	Techniques of Planning-II	2	1	-	-	3
PLN2305	Demography and Urbanization	3	-	-	-	3
PLN2306	Traffic and Transportation Planning-I	3	-	-	-	3
PLN2309	Elements of Economics	3	-	-	-	3
PLN2307	Planning and Design Lab-III (Village Planning)	-	-	10	-	10
<b>Open Electives</b>						
LAN2351	Foreign Language-III French-III	2	-	-	-	2
LAN2352	German-III					
LAN2353	Spanish-III					
LAN2354	Russian-III					
LAN2355	Chinese-III					
LAN2356	Portuguese-III					
LAN2357	Korean-III					
LAN2358	Japanese-III					
LAN2359	Hindi-III					
CSS2151	Effective Listening*	1	-	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	-	1
	<b>TOTAL</b>					<b>29</b>

**FOURTH SEMESTER**

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN2401	Planning Theory-II	3	-	-	-	3
PLN2402	Planning Practice-I	2	1	-	-	3
PLN2403	Traffic and Transportation Planning-II	3	-	-	-	3
PLN2408	Geo informatics for Planning II	3	-	-	-	3
PLN2407	Planning and Design Lab-IV (Landuse and Transport Planning)	-	-	10	-	10
<b>Professional Elective- I</b>						
PLN	Real Estate Development and Management	3	-	-	-	3
PLN	Urban Governance and Management	3	-	-	-	3
PLN	Reading and Comprehending Spaces	3	-	-	-	3
<b>Open Electives</b>						
LAN2451	Foreign Language-IV French- IV	2	-	-	-	2
LAN2452	German-IV					
LAN2453	Spanish-IV					
LAN2454	Russian-IV					
LAN2455	Chinese-IV					
LAN2456	Portuguese-IV					
LAN2457	Korean-IV					
LAN2458	Japanese-IV					
LAN2459	Hindi-IV					
CSS2251	Presentation Skills*	1	-	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	-	1
<b>TOTAL</b>						<b>29</b>

**FIFTH SEMESTER**

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN2502	Planning and Management of Utilities and Services	3	-	-	-	3
PLN2503	Planning Legislation- I	2	-	-	-	2
PLN2507	Planning and Design Lab-V (Sub-City Plan)	-	-	10	-	10
PLN2508	Professional Training- I	-	-	-	-	3
PLN2510	Housing and Community Planning	3	-	-	-	3
PLN2511	Ecology, Environment and Resource Development and Management	3	-	-	-	3



Professional Elective- II						
PLN	Disaster Risk Management and Climate change Adaptations	3	-	-	-	3
PLN2513	Infographic and Storytelling Techniques	3	-	-	-	3
PLN2514	Eco-tourism	3	-	-	-	3
Open Electives						
LAN2551	Foreign Language-V French-V	2	-	-	-	2
LAN2552	German-V					
LAN2553	Spanish-V					
LAN2554	Russian-V					
LAN2555	Chinese-V					
LAN2556	Portuguese-V					
LAN2557	Korean-V					
LAN2558	Japanese-V					
LAN2559	Hindi-V					
CSS2351	Reading and Comprehension*	1	-	-	-	1
BEH2552	Personality, Nationalism and Human Values*	1	-	-	-	1
<b>TOTAL</b>						<b>31</b>

<b>SIXTH SEMESTER</b>						
Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN	Environment Planning	3	-	-	-	3
PLN2605	Planning and Management of Informal Sectors	3	-	-	-	3
PLN2607	Planning and Design Lab-VI (Master Development Plan)	-	-	10	-	10
PLN2608	Metropolitan Planning, Development and Management	3	-	-	-	3
PLN2609	Regional Planning & Management	3	-	-	-	3
Professional Elective- III						
PLN2610	Special Area Planning	3	-	-	-	3
PLN2612	Urban Design, Renewal, and Conservation	3	-	-	-	3
PLN	Big Data and Data Analysis	3	-	-	-	3
Open Electives						
LAN2651	Foreign Language-VI French- VI	2	-	-	-	2
LAN2652	German-VI					
LAN2653	Spanish-VI					
LAN2654	Russian-VI					
LAN2655	Chinese-VI					
LAN2656	Portuguese-VI					
LAN2657	Korean-VI					
LAN2658	Japanese-VI					
LAN2659	Hindi-VI					

CSS2451	Corporate Communication*	1	-	-	-	1
BEH2652	Interpersonal Communication *	1	-	-	-	1
	<b>TOTAL</b>					<b>29</b>

### SEVENTH SEMESTER

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN	Land Economics and Location Theory	3	-	-	-	3
PLN2703	Urban Finance	3	-	-	-	3
PLN2707	Professional Training-II	-	-	-	-	3
PLN2706	Planning and Design Lab-VII (Regional Plan)	-	-	10	-	10
PLN2711	Project Formulation, Appraisal and Management	3	-	-	-	3
PLN2737	Dissertation	1	-	-	2	3
<b>Professional Elective- IV</b>						
PLN2714	Smart cities and Advanced Technologies for Emerging Planning Issues	3	-	-	-	3
PLN	Participatory Integrated Urban Development	3	-	-	-	3
PLN	Sustainable Cities and Regions	3	-	-	-	3
<b>Open Electives</b>						
LAN2751	Foreign Language-VII French-VII	2	-	-	-	2
LAN2752	German-VII					
LAN2753	Spanish-VII					
LAN2754	Russian-VII					
LAN2755	Chinese-VII					
LAN2756	Portuguese-VII					
LAN2757	Korean-VII					
LAN2758	Japanese-VII					
LAN2759	Hindi-VII					
CSS2551	Employability Skills*	1	-	-	-	1
BEH2751	Relationship Management*	1	-	-	-	1
	<b>TOTAL</b>					<b>31</b>

**EIGHTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lectures (L) Hours per week</b>	<b>Tutorial (T) Hours per week</b>	<b>Studio (S) Hours per week</b>	<b>Practical (P) Hours per week</b>	<b>Total Credits</b>
PLN	Planning Legislation – II	3	-	-	-	3
PLN2802	Planning Practice – II	3	-	-	-	3
PLN2803	Human Values in Planning	3	-	-	-	3
PLN2804	Rural Development & Management	3	-	-	-	3
PLN2837	Planning Thesis	-	-	-	-	18
	<b>TOTAL</b>					<b>30</b>

## Syllabus - First Semester

	<b>FUNDAMENTALS OF URBAN AND REGIONAL PLANNING (PLN2101)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Planning and Design Lab- I					
Co-requisites	Statistical and Quantitative Methods for Planning					

### Catalog Description

The aim of the course is to study the concepts and principles of urban and regional planning. The course deals about the aim, objectives, and scope of town planning. The Course comprises of different types of plans and discusses different categories of land use. In other words, course provides comprehensive knowledge to the students about various fields of urban and regional planning and related norms, regulation, and standards for spatial development.

### Course Objectives

The objectives of this course are

- To understand the Rationales and Foundations of Planning.
- To introduce the Hierarchy of Development Plans and Planning Process, and Theories of Urbanization.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the concept of town planning, spatial planning, need, scope and various field of planning.

**CO2:** Explain the various forms of planning in context of space, time and location.

**CO3:** Discuss various type of development plan and implication of development control regulations in planning.

**CO4:** Explain the role of local governance at all levels of planning in India.

Modules	Blooms level*	Number of hours
<b>Unit 1: Rationales of Planning and Planning as a Discipline</b> Various definitions of town and country planning; Goals, objectives and components of planning; Benefits of planning; Planning as a discipline and multidisciplinary nature of planning; Different roles of planners.	L1, L2	9

<b>Unit 2: Foundations of Planning</b> Orthodoxies of planning; Components of sustainable urban and regional development; Reasoning and its forms in planning; Planning knowledge and its various forms; Arguments for and against planning; Economic and societal aspects as bases of town and country planning.	L1, L2	9
<b>Unit 3: Development Plans and Planning Organizations</b> Defining development plan; Types and scope of development plans: regional plan, master plan, zonal plan, town planning scheme, layout plan; Structure plan, district plan, action area plan, subject plan; Hierarchy of plans and its significance; Development regulations; Local government of India; District Planning Committees and Metropolitan Planning Committees; Different development authorities and other organizations like improvement trusts.	L1, L2, L4	9
<b>Unit 4: Theories of Urbanization and Role of Planning Organizations</b> Theories of urbanization including Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory, and other latest theories; Land Use and Land Value Theory of William Alonso; Meanings and forms of globalization; Characteristics of a global city.	L1, L2	9

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation*

#### **Textbooks**

- Faludi, A. (1973). A reader in planning theory, Oxford: Pergamon Press.
- Keeble, L.B. (1969), Principles and Practice of Town and Country Planning, London: Estates Gazette.
- McLoughlin, J.B. (1969). Urban and Regional Planning, London: Faber and Faber.

#### **Reference Books**

- Freidmann, J. (1987). Planning in the Public Domain, Princeton: Princeton University Press.
- Fainstein, S. and Campbell, S. (1996). Readings in Planning Theory, London: Mackwell.
- Hall, P. (1974). Urban and Regional Planning, London: Routledge.

#### **Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

#### **Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--
CO3	1	1	2	--	--	1	--	--	--	--	--	--	1	2	--	2
CO4	1	1	2	--	--	1	1	--	--	2	1	2	1	--	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>TECHNIQUES OF PLANNING – I (PLN)</b>	L	T	S	P	C
Version 1.1		2	1	0	0	3
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Planning and Design Lab – II (Graphics and Presentation Techniques)					

### Catalog Description

The aim of this course is to provide exposure to the students to Basic Techniques of Planning such as preparation of base maps, preparation of checklist and questionnaire, conduction of various kinds of surveys, techniques for data analysis and presentation. This course will enable the students a thorough understanding of all the techniques used for data collection, analysis, and presentation in urban and regional planning. Students will be able to apply these techniques in their planning studios in each of the semesters.

### Course Objectives

The objectives of this course are

- Learn the Methods and Contents of Preparation of Base Maps.
- Get familiar with different Database required for Planning.
- Equip students with various survey techniques pertaining to Socio-economic and physical surveys.
- Acquire know-how of analyzing and presenting statistical and spatial data.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define essential elements and preparation of Base Maps.

**CO2:** Provide an overview about the data requirements, availability and methods for collection.

**CO3:** Utilize their knowledge in conduction of socio-economic and physical surveys.

**CO4:** Incorporate learnt techniques of statistical and spatial data presentation in planning studios.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Unit 1: Types of Data and Sources of Data for Planning</b> Understanding difference between data, information and knowledge; Distinction between facts and opinions; Reliable sources of data and information; Data requirements for urban and regional planning; Sources of primary and secondary data; Overview of data availability from different sources including Census of India, NSSO, etc.	L1, L2, L3	9
<b>Unit 2: Data Collection Methods - Socio-Economic Surveys</b>	L1, L2, L3	9

Questionnaire design, design of sample surveys, types of sampling, measurement scales, data coding and data verification; Qualitative data collection methods: focus group surveys, individual interviews, observations, ethnographic methods; Validity and reliability of data.		
<b>Unit 3: Data Collection Methods - Physical Surveys and Mapping</b> Physical surveys for the preparation of base maps at different scales, contents of base maps; Land use classifications; Techniques for conducting field surveys for land use, building use, density and other surveys needed for planning; Use of information, communication and technology (ICT) based data collection methods.	L1, L2, L3	8
<b>Unit 4: Data Presentation</b> Preparation of tables and charts; Interpreting statistical, qualitative and spatial data to identify trends, patterns and processes; Communication of data through presentations, reports, etc.	L3, L4, L5	10

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- Rezaeian, M., Dunn, G., St. Leger, S., & Appleby, L. (2007). Geographical epidemiology, spatial analysis and geographical information systems: A multidisciplinary glossary. *Journal of Epidemiology and Community Health*, 61(2),
- Schwandt, T. A. (1996). *Qualitative data analysis: An expanded sourcebook*. Evaluation and Program Planning,
- Sonnad, S. S. (2002). *Describing data: Statistical and graphical methods*. Radiology. Radiological Society of North America Inc.
- *Visualising Spatial Data*. (2008). In *Applied Spatial Data Analysis with R* (pp. 57–80). Springer New York.

### **Reference Book**

- *Community Places*. (2014). *Community Planning Toolkit: Community Engagement*. Community Planning Toolkit, 24. Retrieved from
  - <http://www.communityplanningtoolkit.org/sites/default/files/Engagement.pdf>
- Harrison, J. P. (2010). Strategic Planning and Swot Analysis. *Essentials of Strategic Planning in Healthcare*, 91–97.
- Chambers, R. (1994). Participatory rural appraisal (PRA): Analysis of experience. *World Development*, 22(9), 1253–1268.
- Shelton, T., Poorthuis, A., & Zook, M. (2015). Social media and the city: Rethinking urban socio-spatial inequality using user-generated geographic information. *Landscape and Urban Planning*, 142, 198–211.

### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**



**Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	2	--	--	--	--	--	--	--	--	--	1	2	--
CO2	1	--	--	2	--	--	--	--	--	--	--	--	--	1	2	--
CO3	1	--	--	2	--	--	--	--	--	--	--	--	--	1	2	--
CO4	1	--	--	2	--	--	--	--	--	--	--	--	--	1	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>STATISTICAL AND QUANTITATIVE METHODS IN PLANNING (PLN2104)</b>	L	T	S	P	C
Version 1.1		1	1	0	0	2
Pre-requisites/Exposure	Planning and Design Lab-I					
Co-requisites	Fundamentals of Urban and Regional Planning					

### Catalog Description

The aim of this course is to study basic statistical and quantitative methods and applications in planning. In this course concepts of quantitative data and methods of data collection are discussed in detail. This course deals with basic statistical applications and methods which is required for the analysis of collected data in order to draw out results. It is more focuses on methodological part of the planning which is one of the important steps in the planning process.

### Course Objectives

The objectives of this course are

- To study the data collection process and methods for data presentation.
- To study time series analysis and probability distributions

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the procedure of data collection.

**CO2:** Explain the various methods of data presentation.

**CO3:** Describe the important quantitative measures used in planning?

**CO4:** Discuss time series data analysis and its application in planning.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Unit 1: Correlation and Regression Analysis</b> Degree of correlation, Scatter Diagram, correlation analysis, correlation coefficient, co-efficient of rank correlation, partial correlation analysis and multiple correlation, simple Linear and nonlinear regression, lines of regression, coefficient of regression; Multiple Regression Analysis; Use of SPSS and its applications in planning	L1, L2	6
<b>Unit 2: Statistical Inference and Chi-Square Test and Analysis of Variance</b> Types of estimation; Point, interval, testing of hypothesis, statistical hypothesis, simple and composite tests of significance, null hypothesis, alternative hypothesis; Types of errors, level of significance, critical region; Two tailed and one tailed tests, large and small sample tests for mean and proportion; Chi-square distribution: applications of chi-square distribution; Test of goodness of fit; ANOVA distribution; Use of SPSS; Applications in planning.	L1, L2	6

<b>Unit 3: Mathematical Programming Techniques</b> Mathematical Programming models, linear programming problems, transportation problems, assignment problems, applications in planning	L1, L3, L4, L5	6
<b>Unit 4: Qualitative Methods</b> Dimensions of qualitative research; Designing qualitative research; Terms and principles in qualitative data analysis; Content analysis; Narrative analysis; Discourse analysis for planning.	L4, L5, L6	6

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Kapoor, V.K. (2003). Problem and solution in Statistics, Delhi: Sultan Chand Publications.
- Press Pvt. Ltd. New Delhi.
- Braun, V. and Clarke, V. (2013) Successful Qualitative Research: A Practical Guide for Beginners, Sage, New Delhi

### Reference Books

- Gupta, S.K (1982). Fundamentals of Statistics, Mumbai: Himalaya Publications.
- Levin, D., Rubin, D.S. (1978). Statistics for management, New Jersey: Pertinence Hall.
- Gelman, A. and Hill, J. (2006) Data Analysis Using Regression and Multilevel and Hierarchical Models, Columbia University Press, New York.
- Molugaram, K. and Rao, G.S. (2017) Statistical Techniques for Transportation Engineering, BSP Books Pvt. Ltd. Published by Elsevier, London.
- Kambo, N.S. (2008) Mathematical Programming Techniques, Affiliated East-West

### Modes of Evaluation: Presentation/ Assignment/Class Test/ Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	--	--	2	--	--	--	--	--	1	2	1	--
CO2	1	1	1	2	--	--	--	--	--	--	--	--	1	2	1	--
CO3	1	1	1	1	--	--	2	--	--	--	--	--	1	2	1	--
CO4	1	1	1	2	--	--	--	--	--	--	--	--	1	1	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>BASIC COMPUTER APPLICATIONS (PLN)</b>	L	T	S	P	C
Version 1.1		0	2	0	0	2
Pre-requisites/Exposure	Fundamentals of Microsoft (Words, Excel, PPT)					
Co-requisites	Techniques of Planning I					

### Catalog Description

The course aims to study fundamentals of utilizing CAD tools in layout plans and regional plans. The main objective of the course is to develop understanding and details of master plan and regional plan and all other maps by the use of drafting software's like AutoCAD. The course deals with technical aspect and gives a brief on the preparation of base map with the help of command and tools used in the software.

### Course Objectives

The objectives of this course are

- To introduce to students' applications of computer software for report writing, data analysis and presentations required for planning.
- To expose students to the use AutoCAD and similar software to prepare drawings and presentations.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain different basic commands which can be used in Automated drafting.

**CO2:** Explain different tools and commands used in editing and controlling of drafting

**CO3:** Discuss how to digitize layout plans made on paper by hand drafting

**CO4:** Describe use of base map for region, scanning of maps, symbolization and layering in the software.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Unit 1: Introducing Computer Application in Planning</b> Introduction to Computer Applications in Planning; Various software packages, Utility of computers in planning assignments, Current trends in planning with respect to use of computer applications.	L1, L2	6
<b>Unit 2: Advanced Features of MS Word</b> Use of MS Word in report preparation, Adding and updating table of contents, Spell check, thesaurus, working with columns, tabs and indents, creation and working with tables, margins and space management in a document; Adding references and graphics; Importing and exporting across various formats; Creating questionnaires using macros.	L1, L2, L3	6
<b>Unit 3: Advanced Features of MS Excel</b> Defining data and database management; Working with census data; Data analysis using various functions and tools; Creating formulas, using	L1, L2, L3	6

formulas, cell references, replication, sorting, filtering, functions; Preparation of charts and graphs, creating trend lines, and simple macros.		
<b>Unit 4: Introduction to AutoCAD</b> Concept of mapping and drafting techniques; Introduction to AutoCAD; Understanding the fundamental concepts and terminologies used in AutoCAD; Tools for digitization; Modifying tools; Layers' creation and management; Creating blocks, annotation, and scaling; Plotting and printing with hands on exercises.	L1, L2	6

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Textbooks

- Rao, P.N. (2002). CAD/CAM: Principles and Applications, New York: McGraw Hill Education.
- Rod, S. (1987). Computer Graphics: Systems and Concepts, Boston: Addison-Wesley.

### Reference Books

- Ding, S. (2008). Modelling and Visualization with AutoCAD, New York: Fairchild Books Inc.
- Luepton R.M, (2nd edition, 2007). Graphics Concepts of CAD, New Jersey: Prentice Hall.

### Modes of Evaluation: Sheet work/Presentation/Report/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	1	--	--	1	--	1	--	--	--	1	2	2	--
CO2	1	1	1	1	--	--	1	--	1	--	--	--	1	2	--	--
CO3	1	1	1	1	--	--	1	--	2	--	--	--	1	1	--	--
CO4	1	1	1	2	1	1	--	--	2	1	1	1	2	1	1	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>TECHNICAL REPORT WRITING (PLN)</b>	L	T	S	P	C
Version 1.1		1	1	0	0	2
Pre-requisites/Exposure	Planning and Design Lab-I					
Co-requisites	Statistical and Quantitative Methods in Planning					

### Catalog Description

The aim of the course is to study the technical aspect of report writing and role of methodology in research. This course gives an idea of writing skills. The course will introduce the students to all types of technical, scientific, and legal writings. The course will enable the students to conduct systematic research and write technical reports.

### Course Objectives

The objectives of this course are

- To understand the types of reports and style of writing technical reports
- To understand the methods used for conducting research.
- To know about presentation of research.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain differences between different writing formats for reports.

**CO2:** Explain important elements to give a comprehensive understanding of purpose of report.

**CO3:** Describe the differences between different writing styles for articles, papers and other texts.

**CO4:** Explain the basis for selecting appropriate research method and criteria for a good research design.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Unit 1: Written communication</b> Language and communication, differences between speech and writing, distinct features of speech, distinct features of writing, Reading Skills to find out information and get the gist through notes, letters, articles, reports. English comprehension, paraphrasing, summarizing, and editing.	L1, L2	6
<b>Unit 2: Undertaking Literature Review</b> Identification of credible journals, books, reports, etc.; How to read literature; Styles of referencing such as Harvard Style of Referencing, APA, etc., Understanding an argument, developing your own interpretations What is an argument, validity and strength of arguments, common fallacies of reasoning, use and abuse of language in reasoning,	L1, L2	6

<p><b>Unit 3: Format and Elements of Reports</b>  Type; Types of reports, difference between technical, scientific, legal, and other types of communication; specific characteristics of writing technical reports. Preliminaries: contents, preface, acknowledgements, list of tables and figures; Key words and indexing, Body: introduction, sections and sub-sections, or chapters, conclusions, and recommendations; Appendices; References; knowledge of indexing and available reference materials</p>	L1, L2, L6	6
<p><b>Unit 4: Writing a Report</b>  Developing a coherent structure for a term paper and report; Introductory, developmental, transitional, and concluding paragraphs, linguistic unity, coherence and cohesion, descriptive, narrative, expository and argumentative writing. Report writing,</p>	L1, L4, L5	6

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5:Synthesis, L6:Evaluation*

**Textbooks**

- Kothari. C.R. (2009), Research Methodology, New Age International Publisher.
- Kumar R. (2005). Research Methodology, Sage Publication Ltd., New Delhi.

**Reference Books**

- Allwood, J., Anderson, L.G. and Dahl, O. (1992). Logic of Linguistics, Cambridge University, Press, Cambridge.
- Riordan, D. and Pauley, S.E. (2013). Technical Report Writing Today, 10th edition, Cengage Learning, Boston.

**Modes of Evaluation: Group Discussions, Report Submission and Presentation, Literature Review, Referencing, Understanding of Components, Writing Style**

**Examination Scheme:**

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO2	1	2	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO3	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO4	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>PLANNING AND DESIGN LAB-I (AREA APPRECIATION AND SPACE PERCEPTIONS) (PLN2107)</b>	L	T	S	P	C
Version 1.1		0	0	10	0	5
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Basic Computer Applications					

### Catalog Description

The aim of the course is to study spatial aspect at building level. This Course will provide the architecture knowledge to the planning students with basic understanding of different concepts of architecture, design simple layouts and make various basic architectural drawings. This course also introduces the concepts and fundamentals of architectural drawing and develops representation skills and to nurture the understanding of the nature of geometrical forms and simple building forms.

### Course Objectives

The objectives of this course are

- To study Anthropometrics and its Relationship with Building.
- To study various Space Standards, Expression of Built Mass through Plan.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the difference between ergonomics and anthropometry.

**CO2:** Explain the basic concept of form and functions in building design.

**CO3:** Discuss the importance of architectural space standards for designing of simple buildings.

**CO4:** Discuss various measurements of drawings, plans, sections and elevations

Modules	Blooms level*	Number of hours
<b>Unit 1: Elements of a city</b> Understanding various building blocks of a city; Developing understanding about city planning elements using movies, lectures, and city tours.	L1, L2	30
<b>Unit 2: Distance and Area Perception</b> Developing an understanding about distance and area and translating the same to scale on drawings.	L1, L2	30
<b>Unit 3: Space Perception</b> Study of areas with varying characters to appreciate the concepts of built form, activities and people. Appreciate various elements of built form such as plot sizes, FAR, densities, building heights and open spaces; Understanding how built form supports various activities in different areas.	L1, L2, L4	30

<b>Unit 4: Neighbourhood Perception</b> Mapping of a neighbourhood and appreciating the basic characteristics of a neighbourhood; Creation of base maps, recording and presenting information on maps, both manually and digitally.	L1, L4, L5	30
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*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Textbooks

- Chiara J., A. (1980). Time Save Standards for Building Types, McGraw Hill.
- Ching, D.K (2007) Architecture: Form, Space and Order, Oxford: 3rd John Wiley and Sons Inc, Hoboken, New Jersey.

### Reference Books

- Crosbie M. and Watson D., Time Saver Standards for Architectural Design, 8th Mc-Graw Hill
- Lin M. (1985), Architectural Rendering Techniques: A Colour Reference, John Wiley and Sons Inc, Hoboken, New Jersey. Reference

### Modes of Evaluation: Presentation/Assignment/ /Drawings/Plans

#### Examination Scheme:

Components	Internal Assessment						ESJ
	R-I	R-II	R-III	Report	CE	A	
Weightage (%)	50	50	50	40	05	05	200

R: Review, CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	2	--	--	2	--	--	--	--	--	1	2	1	--
CO2	1	1	1	2	--	--	2	--	--	--	--	--	1	2	1	--
CO3	1	2	1	1	--	--	2	--	--	--	--	--	1	2	1	--
CO4	1	1	1	2	--	--	2	--	--	--	--	--	1	2	1	--

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Second Semester

	<b>CITIES IN HISTORY (PLN)</b>	L	T	S	P	C
Version 1.1		2	0	0	0	2
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Planning and Design Lab – II					

### Catalog Description

History informs the present in various ways. Many Cities have evolved over human history. Throughout history, people have been attracted to cities as centers of culture, learning, and economic opportunity. Student will learn about the evolution of cities with respect to political, economic, technological, social and cultural factors.

### Course Objectives

The objectives of this course are

- To understand historical processes of human settlements and development of different patterns.
- To understand common characteristics of settlements in different time periods
- To appreciate influences of political, economic, technological, social and cultural factors in shaping the city and its role in shaping these societal processes

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Analyze historical processes for overview of urban settlements and their various urban patterns.

**CO2:** Identify common elements for categorization of urban patterns based on different parameters.

**CO3:** Demonstrate familiarity with chronological evolution of different cities and their functional and spatial characteristics in different time periods

**CO4:** Develop understanding about various urban processes and different parameters affecting the functioning of a city in terms of its character and pattern.

Modules	Blooms level*	Number of hours
<b>MODULE 1: History and Historical Processes</b> Significance of studying historical processes; Interpreting history for planning purposes; Concept of time as a dimension of built form; Human settlements as a material expression of civilizational development.	L1, L2	6
<b>MODULE 2: Settlements in History</b>	L1, L2	6

Cities in India from medieval to colonial era; Medieval planning in India and their common and distinct elements; Colonial history, built form and town planning; Colonialism and the modernist city in India.		
<b>MODULE 3: Urban Processes</b> Criteria of location and development of towns in Asian history; Political, economic, technological, social and cultural factors shaping settlements through history; Indian city typologies and study of urban growth, decline, renewal in different cities based on functions, locations, etc.	L1, L2	6
<b>MODULE 4: History of Cities in South Asia</b> Evolution of cities in South Asia, Urban patterns and trends, similarities and differences from Indian cities; Historical challenges and interventions in Asian cities; Examples and case studies from South Asia.	L1, L2	6

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5:Synthesis, L6:Evaluation

### Textbooks

- Banga, I. (1991) *The City in Indian History*, Manohar Publishers and Distributors, New Delhi.
- Beverley, E. (2011) *Colonial Urbanism and South Asian Cities*, Social History, Vol. 36, No. 4, pp. 482–497.
- Bosselmann, P. (2008) *Urban Transformation*, Island Press, Washington, D.C.
- Chandavarkar, R. (2009) *History, Culture, and the Indian City*, Cambridge University Press, New Delhi.
- Geddes, P. (1915) *Cities in Evolution*, Williams and Norgate, London.
- Gallion, A.B. (1950) *The Urban Pattern*, John Wiley and Sons, London

### Reference Books

- Gooptu, N. (2001) *The Politics of the Urban Poor in Early Twentieth-Century India*, Cambridge University Press, Cambridge.
- Heitzman, J. (2008) *The City in South Asia*, Routledge, London.
- Kenoyer, J. (1998) *Ancient Cities of the Indus Valley Civilization*, Oxford University Press, New Delhi.
- King, A. (1976) *Colonial Urban Development: Culture, Social Power, and Environment*, Routledge and Kegan Paul, New York.
- Kostof, S. (1993) *The City Shaped: Urban Patterns and Meanings through History*, Bullfinch Publishing, Stockholm.
- Mumford, L. (1961) *The City in History: Its Origins, Its Transformations, and Its Prospects*, Mariner Books, New York.
- Richards, J. (1993) *The Mughal Empire*, Cambridge University Press, New Delhi.
- Sharma, Y. and Malekandathil, P. (2014) *Cities in Medieval India*, Primus Books, New Delhi.
- Smith, M.L. (2003) *The Social Construction of Ancient Cities*, Smithsonian Books, Washington, D.C.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	

<b>Weightage (%)</b>	10	10	10	10	05	05	50
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CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	1	--	1	1	--	--	--	--	--	1	1	--	--	--
CO2	1	--	1	--	1	1	--	1	--	--	--	1	1	--	--	--
CO3	1	--	1	--	1	--	--	--	--	--	--	1	1	--	--	--
CO4	1	--	1	--	1	1	--	--	--	--	--	1	1	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>GEO-INFORMATICS FOR PLANNING-I (PLN)</b>	L	T	S	P	C
Version 1.1		2	0	1	0	3
Pre-requisites/Exposure	Basic Computer Applications					
Co-requisites	Planning and Design Lab – II					

### Catalog Description

This course gives exposure to the students about Remote Sensing and Geographic Information System (GIS) along with its application in spatial planning. The knowledge acquired in this subject can also be used by the students in their thesis exercises as well as it can also help them in getting jobs after the completion of the course.

### Course Objectives

The objectives of this course are

- To study the concepts of Remote Sensing and photo interpretation as well as their uses in Spatial Planning
- To study planning information systems in India and its applications in planning.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the basic principles of Remote Sensing.

**CO2:** Describe the photo-interpretation and use the knowledge in their studio exercises.

**CO3:** Demonstrate planning information system.

**CO4:** Explain the relationship between Human settlements and Planning Information System.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Remote Sensing and Photo Interpretation</b> Remote Sensing: Definition, aerial and satellite remote sensing; Aerial photo-interpretation, qualitative and quantitative elements of photo-interpretation; Satellite remote sensing, geo-stationary and sun-synchronous satellites, principles of electro-magnetic radiations, resolutions; Introduction to digital image processing; salient features of popular remote sensing satellites; Applications in planning along with laboratory exercises	L1, L2	6
<b>MODULE 2: Photogrammetry</b> Limitations of traditional surveys in planning; Photogrammetry as an alternative tool for surveying; Aerial photographs, and their classification; Principles of stereoscopic vision; Basic instruments like Stereopair, Pocket and Mirror Stereoscopes, Parallax Bars; Principles of photogrammetry, Measurement of heights and depths; Introduction to digital photogrammetry.	L1, L2, L3	10
<b>MODULE 3: Planning Information Systems</b> Systems approach to planning as basis for planning information systems; Systems, hierarchy, types; Data and information, value of information, information flows and loops; Information sharing and security; Information	L3, L4	10

systems, types, limitations; New sources of data such as big data and real data.		
<b>MODULE 4: Human Settlements and Planning Information Systems</b> Information needs, scales and levels of human settlements; Preconditions for using planning information systems; Introduction to various planning information systems; Introduction to spatial data infrastructure; Planning information systems in India: NNRMS, NUIS, National Urban Observatory, Municipal information systems, land information systems, cadastre systems; Tools for spatial data handling; Introduction to GIS; BHUVAN; Agencies responsible for generating spatial data.	L1, L2	10

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books/ References

- Victor Mesev (2007). *Integration of GIS and Remote Sensing*. John Wiley Publishing
- Harsan Karimi (2009). *Handbook of Research on Geo- informatics*, IGI Global Publishing
- Yeung, C.P.L.A. (2007). *Concept and Techniques of GIS*. Prentice Hall Publishing
- Nath & Pandey, *Geo-informatics for decentralized planning and governance*, Rawat Publishing
- Wilson, J.P. (2008). *Handbook of GIS*. Blackwell Publishing

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	2	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	2	--	--	--	--	--	--	--	1	1	1	--
CO4	1	1	1	2	--	--	--	--	--	--	--	1	1	1	--
CO5	1	1	1	2	--	--	--	--	--	--	--	1	1	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING COMMUNICATION (PLN)</b>	L	T	S	P	C
Version 1.1		1	1	0	0	2
Pre-requisites/Exposure	Planning and Design Lab – I					
Co-requisites	Planning and Design Lab – II					

### Catalog Description

The aim of this course is to provide the students with the basic tools and techniques for free hand drawing and technical drawings. The primary objective of this course is to develop verbal, visual and interpersonal communication skills.

### Course Objectives

The objective of this course is

- To familiarize the students with various drawing tools and accessories used in drafting and lettering techniques to produce and visualize geometrical composition and form.
- To provide a clear understanding about the scale measurement; plane geometry, solid geometry and projections used as drawing technique.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Draw free hand drawing and lettering.

**CO2:** Project points, lines and planes in different positions in 1<sup>st</sup> angle projection system.

**CO3:** Project regular rectilinear and circular solids in different positions.

**CO4:** Apply their knowledge in making sections, intersections and interpretations of solids.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Visual Communication – Drawings</b> Visual studies about use of line, shape, form, texture, colour, composition, and scale in cities and buildings, streets, cities with special emphasis on rhythms, balance, harmony and proportion etc.; Sketching as a tool for communication; Techniques of preparation of base maps at area, city and regional level; Presentation of planning information through maps, thematic maps	L1, L3, L4	6
<b>MODULE 2: Verbal Communication</b> Language and communication; Differences between speech and writing, distinct features of speech; Body language, eye contact, speech, and spoken expression, Elements of a good verbal presentation.	L1, L3, L4	6
<b>MODULE 3: Photography and Model Making</b> Photography as a tool for visual information; Images and history; Developing basic understanding of photography, use of camera and its functions; Elements of good photographs; Understanding of different	L1, L3, L4	6



materials for models and built form models to understand the concepts learnt in the studio; A study of basic land and built forms through models, and presentation models.		
<b>MODULE 4: Intrapersonal Communication, Listening Skills, Self-Awareness</b> Listening as an active skill; Types of listeners; Listening for general content; Listening to fill up information; Intensive listening; Listening for specific information; Can intensive listening improve understanding.	L3, L4	6

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation

### Text Books

- Sontang, S. (2014) *On Photography*, Penguin, Delhi.
- Jardin, V. (2017) *Street Photography: Creative Vision behind the Lens*, Routledge, New York.
- Goleman, D. (2009) *Emotional Intelligence*, Bloomsbury, New York.
- Zakia, R.D. and Page, D. (2010) *Photographic Composition: A Visual Guide*, Focal Press, Massachusetts.
- Field, K. (2018) *Cartography*, ESRI Press, California.
- Hashimoto, A. and Clayton, M. (2009) *Visual Design Fundamentals: A Digital Approach*, Charles River Media, Needham Heights, M.A.

### Reference Book

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	1	--	--	--	--	--	--	--	--	2	2	2	--	1	--
CO2	--	1	--	--	--	--	--	--	--	--	2	2	2	--	1	--
CO3	--	1	--	--	--	--	--	--	--	--	2	2	2	--	1	--
CO4	--	1	--	--	--	--	--	--	--	--	2	2	2	--	1	--
CO5	--	1	--	--	--	--	--	--	--	--	2	2	2	--	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SITE AND LAND DEVELOPMENT (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Techniques of Planning – I					

### Catalog Description

The aim of this course is to study the Preparation of Base Map from data obtained through Field Survey. The course will convey the theory of map projections and coordinated systems as well as the theoretical basis for data capture within surveying and photogrammetry. This course also deals about topography, terrain and climatic conditions of a region which are essential to understand while preparing a plan. The Course deals about the physical processes on the surface and below the surface of the earth.

### Course Objectives

The objectives of this course are

- To learn the Methods of Techniques of Physical Survey and Preparation of Base Maps and Planning
- To study the Techniques and use of Aerial Photography and GIS for Preparation of Maps and Plans
- To learn Earth Science and Meteorology and their Components.
- To provide knowledge on Geological Structures, Landform, Land Slide, Ground Water Characteristics, etc.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Evaluate areas based on Plain Table Surveying using Digital Planimeter..

**CO2:** Explain the concept of levelling and need of contouring

**CO3:** Explain the various types of landforms affects the implementation of a plan

**CO4:** Demonstrate knowledge and skills about geological and hydrological aspects of land development

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Fundamentals of Surveying</b> Principles of surveying, types of surveying, classification of surveys and maps; Plan versus map, accuracy versus precision, sources and kinds of errors; Least squares adjustments and applications; Key principles of land surveying, basics of chain surveying, basics of levelling; Modern methods and instruments, accessories, operations, EDM without reflecting prisms; Total Station: types, instrument description, field techniques, traversing,	L1, L2, L3	9

motorized total stations, field procedures for total stations in topographic surveys.		
<b>MODULE 2: Topographical Surveying: Concepts and Techniques and GPS</b> Definitions and procedure for topographic surveying, uses of topographical maps; Relief, methods of representing relief, contours and contour intervals, characteristics of contours, methods of locating contours and interpolation of contours; Dam surveys; Various satellites used by GPS: Differential GPS, Fundamentals of GPS, Application of GPS: GPS Receivers, Hand held GPS Receiver – Function – Field procedure	L1, L2, L3	9
<b>MODULE 3: Geology</b> Geological structure, landforms, weathering, landslides and mass wasting; Instability of hill slopes; Land and terrain suitability for various types of development; Earthquakes, seismic zoning, disaster prevention and other planning considerations.	L3, L4, L5, L6	9
<b>MODULE 4: Hydrology</b> Ground Water: Concept and role in urban and regional planning in different types of terrains; Hydrologic cycle; Groundwater bearing properties of different lithological formations, surface water, reservoirs and springs; Artificial recharge and ground water mound; Hydrological features in relation of seepage, fluctuation of water table and hydrographs, geological structure and underground passages for water supply; Hydrology and its links with planning; Implications on site selection and development.	L1, L2, L3	9

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### **TextBooks**

- Arora, D. K. (2018). *Surveying Vol. I*. Standard Book House; 16 edition.
- Bhavikatti, S. S. (2016). *Surveying and Levelling Volume-II, 2nd edition*. I K International Publishing House.
- Edward M. Mikhail, J. S. (2012). *Introduction to Modern Photogrammetry*. Wiley India Pvt Ltd.
- Edward M. Mikhail, J. S. (2012). *Introduction to Modern Photogrammetry*. Wiley India Pvt Ltd.
- Reddy D.V. (2010). *Applied Geology*, Vikas Publication house.
- Reddy M.T.M. (2007), *Applied Engineering Geology*, New Age International.

### **Reference Book**

- Edward M Mikhail and James S Bethel, (2012): *Introduction to Modern Photogrammetry*
- James Warren Bagley, (2018): *The Use of the Panoramic Camera in Topographic Survey: With Notes on the Application of Photogrammetry to Aerial Survey*
- Charles D Ghilani and Paul R Wolf (2018): *Elementary Survey: An Introduction to Geomatics*
- Freeze R.A. (1979), *Ground water*, Prentice Hall.
- Linsley R.K. (2017), *Applied Geology*, MC Grawhill Exclusive.

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--
CO2	1	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--
CO3	1	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--
CO4	1	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--
CO5	1	--	--	--	--	--	--	--	--	--	--	--	2	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>INTRODUCTION TO SOCIAL SCIENCES (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Fundamentals of Urban and Planning					
Co-requisites	Planning and Design Lab II					

### **Catalog Description**

Planning and social sciences are inseparable because planning heavily draws its central ideas from these subjects, particularly, geography, political science, sociology and philosophy, among others.

### **Course Objectives**

The objectives of this course are

- To comprehend analytically the Settlement Hierarchy and Settlement Patterns.
- To understand the Internal Structures of Cities, Land Value and Land Use Theory.
- To develop the ability to Critically Analyze Settlement Systems embedded in the Urban and Regional Planning.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Explain Site and Situation in the context of settlement pattern.

**CO2:** Explain spatial distribution and arrangement of settlements.

**CO3:** Examine the urban land use studies and their applicability in the context of Indian cities.

**CO4:** Assess the image of a city with respect to its socio-economic and physical characteristics

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Geography</b> Human activities such as primary secondary, tertiary and quaternary; Resources and development; Basic landforms; Territory, space, and place; Geographies of scale; Links between geography and planning.	L1, L2	6

<b>MODULE 2: Philosophy</b> Core concepts of philosophy including basic understanding of terms like epistemology, aesthetics, philosophy of action, social philosophy, dialectical materialism, ethics, aesthetics, and lifeworld; Indian philosophers and their big ideas; Types of reasoning and knowledge; Philosophy as a method for enquiry; Links between philosophy and planning.	L1, L2	6
<b>MODULE 3: Sociology</b> Society and its characteristics; Idea of community and its elements; Social systems, social institutions and their functions, social groups, social segregation; Urban and rural society; Links between sociology and planning.	L1, L2, L4	6
<b>MODULE 4: Political Science and Theory</b> Politics and political theory; Basic understanding of the concepts of freedom, liberalism, and neoliberalism; Equity and equality, social justice, rights and citizenship, the right to the city and village.	L1, L3, L4	6

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books**

- Brown, C. and Eckersley, R. (eds.) (2018) *The Oxford Handbook of International Political Theory*, Oxford University Press, New Delhi.
- Choudhry, S., Khosla, M. and Mehta, P.B. (eds.) *The Oxford Handbook of the Indian Constitution*, Oxford University Press, New Delhi.
- Daniels, P.W., Bradshaw, M., Shaw, D., Sidaway, J. and Hall, T. (eds.) 2016) *An Introduction to Human Geography*, Pearson, London.
- Ganeri, J. (ed.) (2012) *The Oxford Handbook of Indian Philosophy*, Oxford University Press, New Delhi.
- Kincaid, H. (2012) *The Oxford Handbook of Philosophy of Social Science*, Oxford University Press, New Delhi.

#### **Reference Books**

- Short, J.R. (2016) *An Introduction to Political Geography*, Routledge, New York

#### **Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

#### **Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	

<b>Weightage (%)</b>	10	10	10	10	05	05	50
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CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	1	2	1	1	2	--	1	--	--	--	--	--	1	2	--	--
<b>CO2</b>	1	2	1	--	--	--	1	--	--	--	--	--	1	2	--	--
<b>CO3</b>	1	2	1	--	--	1	--	--	--	--	--	--	1	--	2	2
<b>CO4</b>	1	--	1	--	1	1	1	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING AND DESIGN LAB-II (SITE PLANNING AND URBAN NEIGHBOURHOOD PLANNING) (PLN2208)</b>	L	T	S	P	C
Version 1.1		0	0	10	0	10
Pre-requisites/Exposure	Planning and Design Lab I					
Co-requisites	Planning Communication					

### Catalog Description

This studio intends to develop vocabulary in planning and develop an ability to observe, record and present data in meaningful ways with the purpose of understanding planning issues. It also intends to develop skills of designing townships.

### Course Objectives

The objectives of this course are

- To do area Appreciation of a Neighbourhood and design a township or site.
- To learn about the Neighbourhood planning

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the basic terminologies in planning.

**CO2:** Apply data collection methods in field surveys.

**CO3:** Identify ways in which we observe, record and present data in meaningful ways.

**CO4:** Demonstrate familiarity with the functioning of a neighbourhood and a site through processes of experiential learning

Modules	Blooms level*	Number of hours
<b>MODULE 1: Neighbourhood study</b> Preparation of Base Maps at the levels of Site, Area, Zone, City, Region, etc.; Preparation of Key Maps; Through land use case studies, students are expected to develop understanding of basic principles of land use planning such as categorization, hierarchy, permissibility, compatibility, etc. and supporting infrastructure required for various land uses.	L1, L2	30
<b>MODULE 2: Analysis</b> Students are expected to apply data collection methods learnt in Planning Techniques class including primary surveys to understand different activities, socio-economic conditions, and infrastructure availability.	L1, L2	30
<b>MODULE 3: Site Planning</b> Designing, Preparation and Presentation of Drawings Design and preparation of plan, sections and elevation of low rise and high-rise apartments taking into account the building bye-laws and zoning regulations; Preparation of presentation drawings. Introduction to the working drawings; Preparation of plans, sections, elevations, and important	L1, L3, L4	30



details of an apartment unit. Site analysis, development standards and preparation of the design brief; various considerations for site layout, conceptual approach to site planning.		
<b>MODULE 4: Appreciation Studies</b> Layouts and Area Analysis Preparation of preliminary layout and area analysis; Final layout showing the circulation and basic infrastructure. Rough costing of the scheme, and preparation of the model to an appropriate scale.	L1, L3, L6	30

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- LaGro, J.A. Jr. (2013) *Site Analysis: Informing Context-Sensitive and Sustainable Site Planning and Design*, Third Edition, Wiley International, New York.
- Lynch, K. (1984) *Site Planning*, Third Edition MIT Press, USA.
- McHarg, I. (2008) *Design with Nature*, Twenty Fifth Edition, Wiley International, New York.
- Russ, T. (2009) *Site Planning and Design Handbook*, Second Edition, McGraw Hill, New York.

### Reference Books

- Sheth, A., and Panchal, N. and Patel, S.B. (2007) Urban Layouts, Densities and the Quality of Urban Life, *Economic and Political Weekly* Vol. 42, No. 26, pp. 2725-2736.
- Vidyarthi, S. (2015) *One Idea Many Plans: An American City Design Concept in Independent India*, Routledge, New York

### Modes of Evaluation: Assignment/Case Study/ Presentation/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	R-I	R-II	R-III	Report	CE	A	
Weightage (%)	50	50	50	40	05	05	200

R: Review, CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	1	2	--	--	--	2	1	--	--	1	2	1	1
CO2	1	2	1	1	2	--	1	--	1	1	--	--	2	1	2	1
CO3	1	2	1	2	2	--	1	--	1	1	--	--	2	1	2	1
CO4	1	1	1	2	--	1	1	--	--	2	--	--	1	1	2	2

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Third Semester

	<b>PLANNING THEORY-I (PLN2301)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Techniques of Planning I					
Co-requisites	Fundamentals of Urban and Regional Planning					

### Catalog Description

The main aim of the course is to study theoretical foundations of planning theory. This course is to study and analyse the concept of planning theory. The course aims to give comprehend knowledge about planning theories in Indian context. The role of public participation in planning process is to be study in this course and its effectiveness in the plan for social welfare in sustainable manner. Learning from advance nation in the planning, implementation and evaluation is also included in this course.

### Course Objectives

The objectives of this course are

- To comprehend theorization process in planning and centrality of participation in planning theory.
- To understand sustainability, rationality and globalization.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the role of planning theory in guiding development process in developing countries like India.

**CO2:** Explain the importance of participation in any development plan.

**CO3:** Describe sustainable urban development.

**CO4:** Discuss the advantage and disadvantage of compact city.

Modules	Blooms level*	Number of hours
<b>Module 1: Theory, Planning Theory and Paradigm Development</b> Definitions of theory in general; Definitions of planning theory including theory of planning, theory in planning and theory about planning; Definition of paradigm and its various stages of development by Kuhn; Significance of planning theory.	L1, L2	10
<b>Module 2: Participation in Planning</b> Public interest and its forms; History and significance of public participation; Methods of public participation; Impediments to public participation and	L1, L2	8

conditions for effective public participation; Public participation and empowerment; Participation, policy formulation and implementation.		
<b>Module 3: Sustainability, Rationality and Globalization and Theories of City Development</b> Sustainability and rationality in planning; Components of sustainable urban and regional development; Globalization, modernism and postmodernism debate; Pragmatism in planning; Regime theory and urban politics; Compact city approach: concept, advantages and limitations; Forms of cities in developing world, Forms of cities in the developed world; Forms of cities in the former and present socialist countries.	L1, L2	8
<b>Module 4: Planning, Implementation and Evaluation</b> Need for evaluation; Inseparability of planning and evaluation; Planning theories and evaluation; Methods of evaluating development plans; Theories of implementation of planning policies and development plans.	L1, L2	10

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Rajput, R.K. (2013). *Elements of Mechanical Engineering*, Delhi: Lakmi Publication.
- Jain, V. (2011). *Basics of Mechanical Engineering*, Delhi : Dhanpat Rai Publication.
- Kumar, D.S. (2013). *Elements of Mechanical Engineering*, , Delhi : S.K. Kataria and Sons Publications.

### Reference Books

- Ganesan, V. (2017). *Internal Combustion Engine*, New-Delhi: Tata McGraw Hill.
- Nag, P.K. (2013). *Engineering thermodynamics*, New-Delhi: Tata McGraw Hill.
- Kumar, D.S. (2013). *Thermal Engineering*, New-Delhi: S.K. Kataria and Sons Publications.
- Hazra, S.K. and Chaudhary, A.K. (2012). *Workshop Technology Vol. II* . New Delhi: Asian Book Comp.

**Modes of Evaluation: PPT presentation on projector of Theory/Group Discussion/ Individual Presentation/ Case Study**

### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	2	2	--	--	--	2	--	--	1	1	--	--
CO2	1	1	--	2	2	2	--	--	--	2	--	--	1	1	--	--
CO3	1	1	--	2	1	1	--	--	--	2	--	--	1	1	--	--
CO4	1	1	--	--	--	2	--	--	--	2	--	--	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>TECHNIQUES OF PLANNING II (PLN2303)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Techniques of Planning- I					
Co-requisites	Demography and Urbanization					

### Catalog Description

The Course aims to study advanced planning techniques. This course give exposure to the students about the techniques for understanding various phenomenon in planning. The course aims to make students aware about the plan preparation techniques in urban as well as regional planning. Formulation of spatial standards in planning has also been focused upon. The course also briefs about applications of advanced techniques used in planning.

### Course Objectives

The objectives of this course are

- To understand Advanced Planning Techniques.
- To develop the ability to professionally examine the Urban and Regional Planning Issues.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the Locational attributes of activity/population and urban structure.

**CO2:** Explain spatial standards for residential, industrial, commercial and recreational areas and their importance in planning.

**CO3:** Discuss the methodology of Master and Regional Plan.

**CO4:** Describe retail location analysis, industrial location analysis, gravity analysis etc.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Data Analysis, reasoning, and relationships</b> Data tabulation: Statistical methods, frequency distribution, classification, mean, median, mode, correlation; Content analysis: discourses and narratives; Land use classification systems; Planning standards, population, and economic analysis; Land suitability analysis, housing analysis, and development of indicators.	L1, L2, L4	10
<b>MODULE 2: Techniques for Plan Preparation</b> Types and levels of plans, hierarchy of plans, planning process; Forecasting techniques, extrapolation techniques, cohort component techniques, economic analysis techniques; Goal formulation; Developing planning standards; Urban growth models and their uses in forecasting.	L1, L4	8
<b>MODULE 3: Methods of Plan Evaluation</b>	L1, L2	10

Cost benefit analysis, planning balance sheet, logical framework approach; Plan evaluation techniques; Purpose of models, types of decision models, linear programming models, threshold analysis; Agent based decision models, multi-criteria decision models; Plan monitoring and outcome evaluation techniques.		
<b>MODULE 4: Public Participation Techniques</b> Purposes of participation; Types and methods of participation; Challenges and issues in the use of participatory methods in planning.	L1, L3, L4	8

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Textbooks

- Kelley R.M. (1988) *Planning Techniques (Basic and Advanced)*, Kelley Communication Development, Indiana University Press, Bloomington, Indiana.
- Jepson, E.J. and Jerry W. (2016) *Fundamentals of Plan Making: Methods and Techniques*, Routledge, New York.
- Field, B. and MacGregor, B.D. (2018) *Forecasting Techniques for Urban and Regional Planning*, Taylor and Francis Group, London.
- Klosterman R.E. (1990) *Community Analysis and Planning Techniques*, Rowman and Littlefield Publishers, Lanham, Maryland.
- Hughes, J.T. and Kozlowski, J. (1968). Threshold Analysis – An Economic Tool for Town and Regional Planning, *Urban Studies*, Vol No.5, No.2, pp. 132-143.
- Rondinelli, D.A. (1973). Urban Planning as Policy Analysis Management of Urban Change, *Journal of the American Institute of Planners*, Vol. 39, No. 1, pp. 13 – 22.

### Reference Books

- Bracken, I. (1999). *Urban Planning Methods: Research and Policy Analysis*, London: Methuen Publications.
- Field, B. and MacGregor, B.D. (1992). *Forecasting Techniques for Urban and Regional Planning*, Abingdon: Routledge Publication.
- Hazra, S.K. and Chaudhary, A.K. (2012). *Workshop Technology Vol. II*. New Delhi: Asian Book Comp.

### Modes of Evaluation: Presentation/Assignment// Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	--	1	--	2	--	--	--	1	1	1	--

<b>CO2</b>	1	1	1	2	--	--	1	2	2	--	--	--	1	1	1	--
<b>CO3</b>	1	1	1	1	--	--	1	2	1	--	--	--	1	1	1	--
<b>CO4</b>	1	1	2	2	--	--	2	1	1	--	--	--	1	1	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>DEMOGRAPHY AND URBANISATION (PLN2305)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Techniques of Planning II					

### **Catalog Description**

The course aims to make students aware about population structure, its composition, urbanization, and urban systems in Indian context. This course gives exposure to usage of socio-economic data in planning and enhances their knowledge regarding population, evolution of urbanization trends in a settlement and its related planning theories. The course consists of five modules which assists student in understanding various dimension of population in a city or region, related issues and analyses settlement system rooted in urban and regional planning.

### **Course Objectives**

The objectives of this course are

- To study varied relationships between demography and urbanization in India.
- To develop the ability to critically analyze settlement systems embedded in the urban and regional planning.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Discuss population structure, its composition and usage of socio-economic data in urban and regional planning.

**CO2:** Describe the various demographic variables, their implication in planning and role of Census in defining the urban places in region.

**CO3:** Explain the history of urbanization, its process and functional classification of urban places

**CO4:** Discuss legal sphere of urban planning such as state level policy, national Urbanization Policy, five years plans etc.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Study of Population</b> Evolution of population studies, development in the field of demography as a separate discipline, contributions of the key demographers; Understanding demographic approaches and key demographic principles including study of population size, determinants of population size, population structure and composition; Spatial distribution of population, measures of population distribution and concentration, factors affecting population distribution and	L1, L2	12



density; Demographic trends at global, national, regional and city scale; Census definitions, levels and types of demographic data, methods and sources of demographic data; Introduction to census and registration data, census methodology across various countries, accessing and using census information available at various levels and recent developments in census enumeration.		
<b>MODULE 2: Vital Demographic Statistics</b> Defining and understanding trends of vital statistics such as fertility, mortality, migration, demographic balancing equation; Defining migration, theories of migration and population movement, types of migration, causes and consequences of population movement; effects of migration in the composition of population, migration trends in developing countries; Population growth and decline; Techniques of population projections and forecast i.e. arithmetic, geometric, exponential, logistic; Advantages and limitations in these methods, and key assumptions; Concept of life table, techniques for preparing life table, its uses and limitations; Computation of survival rates, life expectancy; Concept of cohorts and generation of cohort table and its uses.	L1, L2	8
<b>MODULE 3: Urbanization Trends and Patterns</b> Defining urbanization; History and patterns of urbanization in the world and in India; Mughal and British influences on Indian cities and regions; Post-independence urbanization, process of urbanization as influenced by socio-cultural, political, economic and administrative factors; Problems and challenges of urbanization, determinants of urbanization, factors influencing urbanization, impact of urbanization on cities and its surrounding areas and methods of measuring urbanization; Census definitions of urban places, formal and functional classification of urban places; Understanding concepts like primate city, rank-size rule, rural-urban dichotomy and continuum, and rural-urban fringe.	L1, L2	8
<b>MODULE 4: Urbanization Policies and Strategies</b> Need for urbanization policies, urbanization policies across the world, key features and components of urbanization policies in India, basic issues in urbanization policies; Role of government and key stakeholders like various levels of government in managing rapid urbanization in India; Latest developments in formulating urbanization policy in India, current programmes and schemes, key demographic challenges for urban and regional planners.	L1, L2	8

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- Shivaramakrishnan, K.C and Kundu, A. and Singh, B.N. (2005), Handbook of Urbanisation in India, New Delhi, Oxford University Press.
- Kundu,A. (2011), Trends and Process of Urbanization in India, IIED and UNFPA, London
- Misra, R.P. (1998), Urbanization in India: Challenges and Opportunities, ICSSR Shillong

### **Reference Books**

- Ramachandran, R (1997). Urbanisation and Urban Systems in India, New Delhi : Oxford University Press.

**Modes of Evaluation: Presentation/Assignment/Class Test/Written Examination**

**Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	1	--	--	--	--	--	--	--	--	1	2	1	--
CO2	1	1	1	1	1	1	--	1	1	1	1	2	1	1	2	2
CO3	1	1	1	2	--	--	--	--	--	--	--	--	1	2	1	--
CO4	1	2	1	1	1	1	--	--	--	--	--	--	1	1	--	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>TRAFFIC AND TRANSPORTATION PLANNING-I (PLN2306)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Techniques of Planning I & II					
Co-requisites	Planning and Design Lab III					

### Catalog Description

This course aims at to study essential components of traffic and transportation planning including field surveys, facility design and traffic management. The course gives a brief on prediction of usage demand in future travel and to ensure all the necessary facilities and services to cater to that demand. Transport planning is highly essential in shaping cities, enabling economic activities, promoting community interaction, and enhancing quality of life. It is also essential for sustainable development and ensuring safe accessibility at various levels for all individuals.

### Course Objectives

The objectives of this course are

- To familiarize students about different Transport Systems and Road Capacity.
- To provide basic Concepts for Designing Transport Facilities and Traffic Management Systems.
- **Course Outcomes**
- On completion of this course, the students will be able to
- **CO1:** Explain road safety and design standards for roads and intersections
- **CO2:** Conduct transport related survey
- **CO3:** Describe the Pedestrian circulation, traffic signals and Road Marking
- **CO4:** Describe the road accidents and rules and regulation pertaining to road safety
- 

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to Road Safety and Design standards for roads and Intersections</b> Road as an active space, Types of Users, User Behaviour; Need of road safety, Accidents sign, concept of civic sense and its relationship to road safety; Road classification, Design of Roads: Right of way, Carriageway, Median, Shoulders, Sidewalk, Lanes, Curbs, Camber, etc.; Types of road intersections, basic forms of at-grade Junctions, Grade separated Junctions, Design and spatial standards for Traffic Islands, Turning Radius, Pedestrian Crossings, Diverging, Merging and Weaving Traffic, location and design for traffic signals;	L1, L2	9

<b>MODULE 2: Transport Surveys</b> Uses and applications of transport surveys; Methods of conducting, analysing and presenting transport surveys such as traffic volume survey, speed studies, pedestrian and walkability studies, PT and IPT studies, parking studies, and origin and destination survey.	L1, L2, L4	9
<b>MODULE 3: Pedestrian Circulation, Traffic Signals and Road Marking</b> Pedestrian cross-sectional element: Street furniture and landscaping; pedestrian infrastructure, norms, standards and guidelines; Pedestrian friendly design and planning principles; Traffic Signs: Typology, Principles and Standards- Location, Height and Maintenance; Road Marking: Typology, Material, Colour, and Typography of the markings; Traffic Signals: Introduction, advantages and disadvantages, Signal Indications	L1, L2, L4	9
<b>MODULE 4: Road Accidents and Regulations</b> Nature and Types of Road Accidents, Fatality Rates, Collision Diagrams, and Traffic management measures; Indian Motor Vehicles Act, Traffic Rules and Regulations, National Road Safety Policy, National Urban Transport Policy, Comprehensive Mobility Plan, Case studies	L1, L2	9

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books/**

- Kadiyali, L.R.(1999). Traffic Engineering and Transport Planning, Delhi : Khanna Publishers.
- Saxena, S.C. (2014). Textbook Of Highway And Traffic Engineering, Delhi : CBS Publishers and Distributors.
- Taylor, M.A.P and Bonsall, P.W. (1996). Understanding Traffic Systems: Data Analysis and Presentation, Abingdon, Routledge Publishers.
- URDPFI, (2014), Standards and Guidelines and Guidelines on Transportation, Delhi : ITPI.

#### **Reference Books**

- Buchanan, C. (1963), Traffic in Towns, HMSO.
- OECD, (1975). Better Towns with Less Traffic
- IRC, Publication on Standards and guidelines.

**Modes of Evaluation: Assignment/Case Study/ Presentation/Class Test/Written Examination**

#### **Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### **CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	--	--	2	--	1	--	--	--	1	1	2	--
CO2	1	1	1	1	1	--	2	--	1	--	--	--	1	1	1	--
CO3	1	1	1	1	2	--	2	--	1	--	--	--	1	1	1	--
CO4	1	1	2	2	1	--	1	--	1	--	--	--	1	1	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING AND DESIGN LAB-III (VILLAGE PLANNING) (PLN2307)</b>	L	T	S	P	C
Version 1.1		0	0	10	0	10
Pre-requisites/Exposure	Planning and Design Lab I and II					
Co-requisites	Traffic and Transportation Planning-I					

### Catalog Description

Village study would involve an analysis of a rural settlement by comprehending social, economic, physical and political aspects. This exercise would also focus on the understanding of the history of a village and its people, basis of spatial organisation of a village and its transformations over the years. The study would also involve understanding of land administration in the village. This would further include understanding of land between abadi area and revenue boundary of a village. Lastly, a study of government schemes for the entire village would be undertaken. Students would be expected to develop sensitivity to development issues in a rural settlement.

### Course Objectives

The objectives of this course are

- To understand the history of a village and its people, basis of spatial organization of a village and its transformations over the years.
- to learn techniques for analyzing the village and addressing the rural issues
- To understand key techniques for management and enhancement of village development

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the village with respect to its history and origin

**CO2:** Conduct the surveys required for planning of a village

**CO3:** Analyze a village based on the data availability

**CO4:** Evaluate a village and propose a suggestive measure for proper development

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module 1: Introduction to RADPFI</b> Need of RADPFI guidelines, Aim and Objectives, Scope and Application, Plan Formulation framework, Legislative Process, Spatial Approach to rural Planning	L1, L2	30
<b>Module 2: Rural Infrastructure Planning</b> Landuse, Norms and Standard: Habitat planning, road infra., social facilities, water supply, sanitation, solid and liquid waste management	L1, L4	30
<b>Module 3: Site selection</b>	L1, L6	30

Literature Review, Case study Presentation, Regional setting of selected village, Data Collection through Survey: Primary and Secondary		
<b>Module 4: Data Analysis</b> Data Analysis, Proposal and Report	L1, L4	30

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Manual – Integrated Village Planning and Development; Ministry of Panchayati Raj, Govt. of India [<http://www.undp.org/content/dam/india/docs/DG/preparation-ofmanual-for-planning-integrated-village-development.pdf>]
- Saansad Adarsh Gram Yojana (SAGY) – Guidelines Dept. of Rural Development, MoRD, Govt. of India [[pib.nic.in/archieve/others/2014/.../d2014101101.pdf](http://pib.nic.in/archieve/others/2014/.../d2014101101.pdf)]
- Saansad Adarsh Gram Yojana : Sankalan – Initiatives in SAGY Gram Panchayats Dept. of Rural Development, MoRD, Govt. of India, NIRD & PR, Hyderabad
- Pradhan Mantri Adarsh Gram Yojana (PMAGY) – Guidelines Ministry of Social Justice & Empowerment, Govt. of India [<http://socialjustice.nic.in/writereaddata/UploadFile/pmagy%20guidelines-revised-2015-english.pdf>]

### Reference Books

### Modes of Evaluation: Assignment/Case Study/ Presentation/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	R-I	R-II	R-III	Report	CE	A	
Weightage (%)	50	50	50	40	05	05	200

R: Review, CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	--	--	--	1	--	1	--	--	--	1	1	1	--
CO2	1	1	1	2	--	--	1	--	1	--	--	--	1	1	1	--
CO3	1	1	1	2	--	--	1	--	1	--	--	--	1	1	1	--
CO4	1	1	1	2	--	--	2	--	1	--	--	--	1	1	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>ELEMENTS OF ECONOMICS (PLN2309)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Statistical and Quantitative Methods in Planning					

### Catalogue Description

The aim of this course is to provide exposure to the students to basic concepts of economics such as micro and macro-economics. This course will enable the students a thorough understanding of all the theories and definitions of terms relating to economics in planning and their usage in urban and regional planning. The students will know about the market factors of supply and demand and how it effects planning.

### Course Objectives

The objective of this course is to

- To study the economics; micro and macroeconomic decisions; use of economics in planning.
- To study the Law of demand and supply, elasticity of demand and supply, its use in planning.
- To study the theory of production and concept of the income and employment.
- To study the urban and regional economics.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Understand the theory of supply and demand and its use in planning.

**CO2:** Know the theory of firm production and factors of production and economics of scale.

**CO3:** Understand the concept of Income and employment and its role in planning and development.

**CO4:** Learn basic concepts of urban and regional economics and its significance in planning.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module 1: Definition and Scope of Economics in Planning</b> Central problems of economics; Micro and macro-economic decisions, and use of economics in planning; Basic economic concepts relevant to urban and regional planning and related sectors; Relationship between economic forces and planning.	L1, L2, L3	6
<b>Module 2: Theory of Demand and Supply</b> Laws of demand and supply; Elasticity of demand and supply, and its uses in urban and regional planning.	L1, L2, L3	6
<b>Module 3: Theory of Firm Production</b> Perfect and imperfect markets, and market demand and supply; Pricing under different market conditions; Theory of production, factors of	L1, L2, L3	6



production, costs, scale of production; Economies of scale; Economies of agglomeration.		
<b>Module 4: Concepts of Income, Employment and Money</b> Classical and modern approaches; Growth and development indicators; Measures of national income; Defining development and under development through various approaches.	L1, L2, L3	6

\*Bloom's Level:

L1: Knowledge; L2: Comprehension; L3: Application; L4: Analysis; L5: Synthesis, L6: Evaluation

### Text Books

- Rostovzeff, Michael & Shine, M. L. (2007). Urban Land Economics. *BiblioLife*.
- Fisher, Byron. (2007). The Supply and Demand Paradox. *BookSurge*.
- Dutta, Subhendu . (2006). Introductory Economics (Micro and Macro). *New Age International Publishers*.

### Reference Book

- McCann, Philip. (2001). Urban and Regional Economics. *Oxford University Press*.
- Montresor, Sandro & Vezzani, Antonio. (2015). The production function of top R&D investors. *EResearch Policy*, 44(2), 381-393.
- Forrester, Jay W. (1996). Economic Supply and Demand. *MIT Press*.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	--	--	--	--	--	--	1	1	1	--	--	--
CO2	1	--	--	--	--	--	--	--	--	--	1	1	2	--	--	--
CO3	1	--	--	--	--	--	--	--	--	--	1	1	1	--	--	--
CO4	1	--	--	--	--	--	--	--	--	--	1	1	1	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Fourth Semester

	<b>PLANNING THEORY-II (PLN2401)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Planning Theory- I					
Co-requisites	Fundamentals of Urban and Regional Planning					

### Catalog Description

The main aim of the course is to study advanced planning theory. This course is to study and analyze the development control regulation at all levels. The course aims to give comprehend knowledge about functions and spatial jurisdictions of development authorities. The role of coordination in planning practice is to be study in this course and its effectiveness in the plan. Learning from advance nation in the planning, implementation and evaluation is also included in this course. The course assists students in understanding the role of private sector in infrastructure development.

### Course Objectives

The objectives of this course are

- To understand Rational Planning Model.
- To understand Advocacy Planning and Equity Planning and Collaborative Planning Theory.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the relevance of public policy and policy formulation at center and state level.

**CO2:** Explain functions and spatial jurisdictions of development authorities

**CO3:** Describe development control regulation.

**CO4:** Discuss the role of coordination in planning practice.

Modules	Blooms level*	Number of hours
<b>Modules 1: Scientific Rationalism and Planning</b> Defining instrumental rationality; Systems view of planning; Chief characteristics of Comprehensive Rational Planning Model and implications for planning practice; Systematic and systemic change.	L1, L2	9
<b>Modules 2: Advocacy Planning, Equity Planning and Political Economy Theories</b> Meaning, historical background and purposes of Advocacy Planning Model; Main features of Advocacy Planning Model; Relevance for planning practice; Equity and its various definitions; Major components of the Equity Planning Model; Implications on the role of planners in planning practice; Defining the term political economy; Role of the state in planning; Contributions of	L1, L4	9

David Harvey, Manuel Castells and others; Richard Foglesong and the property contradiction.		
<b>Modules 3: Collaborative and Communicative Planning</b> Various components of Collaborative Planning Model; Contributions of Patsy Healey and Judith Innes and others; Deliberative policy analysis; Role of trust in planning; Planning as persuasive storytelling; Pragmatic planning theory.	L1, L6	9
<b>Modules 4: Human Development Approach</b> Defining functioning and capabilities; Exploring relevance of Amartya Sen and Nussbaum's capabilities to planning; Role of planning and planners in enhancing capabilities of the poor; Capabilities perspective on slums and squatters; Feminist planning theory; Planning, caste and religion; Planning rights and responsibilities.	L1, L4	9

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Allmendinger, P. Planning Theory Second Palgrave Macmillan, London.
- Finche and Iveson, K R. and Planning for Diversity First Palgrave Macmillan, London.

### Reference Books

- Brooks, M.P. Planning Theory for -- American Planning Practitioners Association, Washington.
- Fainstein, S.S. and Readings in Planning Theory Second Blackwell, London.

**Modes of Evaluation: PPT presentation on projector of Theory/Group Discussion/ Individual Presentation/ Case Study**

### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	1	2	2	--	--	--	2	--	--	1	1	--	--
CO2	1	1	--	2	2	1	1	1	--	2	--	--	1	1	--	--
CO3	1	1	--	2	1	1	--	--	--	2	--	--	1	1	--	--
CO4	1	1	--	--	--	2	--	--	1	1	1	--	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly relate

	<b>PLANNING PRACTICE-I (PLN2402)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Planning Theory – I, Techniques of Planning – I					
Co-requisites	Planning Theory - II					

### Catalog Description

The aim of this course is to Study Development Regulations and the role of various Agencies in the practice of Urban and Regional Planning. This course objective to provide the foundation, knowledge and skills needed to work in planning Organisation. It is designed to build understanding of the complex interactions and uncertainties of the development process.

### Course Objectives

The objectives of this course are

- To understand the roles of Central Town and Country Planning Organization; State Town and Country Planning Departments / Directorates; Development Authorities and Local Bodies in Urban and Regional Plan formulation and implementation.
- Identify the agencies that involves in planning process and development plan, execution and operation and maintenance
- To understand Type and Role of Private Sector Participation in Spatial Planning Practice.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the role of planning organization and their policies

**CO2:** Identify the functions and jurisdictions of development authorities

**CO3:** Explain different development regulations with the help of NBC & URDPFI

**CO4:** Explain the role and need of coordination in planning

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Planning as a Profession</b> Definition of profession; Planning as a profession and Role of a Planner in society, different roles of planner in practice; Planner in relation with other professions	L1, L2	10
<b>MODULE 2: Nature of Planning Practice</b> Nature of planning practice in general and in Indian context; Changing global context and planning practice; Evolution of planning in India	L1, L2	8
<b>MODULE 3: Framework of Planning Practice</b> Legal framework for planning in India, planning and development organisations at Central, state and local level; planning practice in private sector; Scope of work in planning practice, fees and other terms and conditions of planning work.	L1, L2,	10

<b>MODULE 4: Planning Practice Cases</b> This unit would focus on developing a critical reasoning and communication skills through study of planning cases including planning permissions, court cases, attending public meetings etc., application of concepts of previous units through study of planning practice; documentation of cases.	L1, L2, L5	8
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\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Town and Country Planning Organization (2018): *Policy for Capacity Building of Officers of Town & Country Planning Department*, Haryana, Government of Haryana
- TCPO, (2016): *Model Building Bye-Law*, Town and Country Planning Organization, Ministry of Urban Development, Delhi
- AITP Reading Material on *Environmental Planning and Design*, Prof A. K. Maitra , SPA Delhi

### Reference Books

- CPCB Guidelines for Bio-Technologies for Treatment of Wastes and Cleaner Technologies - Issue and Options
- Exploring Possibilities of Achieving Sustainability in Solid Waste Management, Ramachandra T.V. and Saira Varghese K., Indian Journal of Environmental Health, 45 (4):255-264, 2003

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	1	--	--	--	--	--	1	1	--	--	--
CO2	1	1	--	--	--	1	--	1	--	--	--	1	1	--	1	1
CO3	1	1	1	--	--	--	--	--	--	--	--	--	1	--	1	1
CO4	1	1	--	--	--	1	--	--	--	--	--	1	1	--	--	--
CO5	1	1	1	--	--	--	--	--	1	--	1	1	1	--	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>TRAFFIC AND TRANSPORTATION PLANNING-II (PLN2403)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Traffic and Transportation Planning I					
Co-requisites	Planning and Design Lab – IV (Transportation Planning)					

### Catalog Description

The aim of this course is to provide exposure to the students to essential understanding Transportation System for the development of particular specific location and society. This course will enable the students with development of transportation management system. Economic relevance and different types of policies related to City Planning. Students will be able to apply or reference these techniques in their planning studios in each of the semesters for major and minor planning exercise.

### Course Objectives

The objectives of this course are to

- Learn the fundamentals of urban form and structure.
- Get familiar with different types of surveys used in transportation planning.
- Equip students with role of economic evaluation in any transport development.
- Learn the impacts of the transport development on environment.
- Acquire know-how to develop new policies and transportation management plan effectively.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define different types of Urban Structure and Transportation System.

**CO2:** Provide an overview about the Comprehensive Transport Planning.

**CO3:** Utilize their knowledge in conduction role of Economic Evaluation

**CO4:** Incorporate the impact of Transport on Environment.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Transport Policy</b> Evolution of transport policy in India, current transport policy in India, Asian perspective on transport policy; Interactions between transport and other policy areas; Land use and transport policies: Translation of national policy in city and local level plans.	L1, L2, L3	9
<b>MODULE 2: Urban Transport System</b> Urban form and transport systems; Impact of land use on transport and vice versa; Transport and quality of life planning for transport in cities and towns; Data requirements and planning techniques, travel behavior and its	L1, L2, L3	9

determinants, choice modelling, influencing travel behavior, land use transport models for cities; Provision of new mass transit in cities; Specific challenges of small towns and big cities; Roles and responsibilities of various agencies; Provision for freight transport.		
<b>MODULE 3: Regional Transport System</b> Planning for regional transport systems; Data requirements and planning techniques; Importance of accessibility in regional transport planning; Indicators of accessibility to basic services; Planning parameters for road, rail, air and water transport systems; Locational parameters for regional transport nodes; Roles and responsibilities of various agencies.	L3, L4, L5, L6	9
<b>MODULE 4: Transport Economics</b> Pricing and funding of transport services and systems; Socio-economic appraisal of transport projects; Techniques for estimating direct and indirect road user costs benefits; Monetization of costs and benefits; Investment criteria and public private partnerships in the transport sector.	L3, L4, L5, L6	9

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

#### **Text Books**

- Sarkar, P.K., Maitri, Vinay, Joshi, G.J., (2014). Transportation Planning: Principles, practices and Policies, PHI publishers New Delhi, India
- Victor, Dr. D Johnsan, (2012). Urban Transportation: Planning, Operation and Management, PHI Publishers New Delhi, India
- Kadiyali L. R.,(2018), Traffic Engineering and Transport Planning, Khanna Publishers, New Delhi

#### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

##### **Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### **CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	1	--	--	--	--	--	--	--	--	2	--	1	--
CO2	1	1	--	1	--	--	--	--	--	--	--	--	2	--	1	--
CO3	1	1	--	1	--	--	--	--	--	--	--	--	2	--	1	--
CO4	1	1	--	1	--	--	--	--	--	--	--	--	2	--	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>GEO-INFORMATICS FOR PLANNING II (PLN2408)</b>	L	T	S	P	C
Version 1.1		0	0	3	0	3
Pre-requisites/Exposure	Geo-Informatics for Planning I					
Co-requisites	Planning and Design Lab – IV					

### Catalog Description

The aim of this subject is to equip the students with the know-how of Geographic Information System and its application in spatial planning. This course will enable students to understand the need and potential uses of GIS in Urban and Regional Planning. They will learn to generate digital spatial data base for their planning studio exercises and methods for spatial data analysis. Students will be able to apply GIS techniques and methods in their planning studios and thesis in each of the semesters.

### Course Objectives

The objectives of this course are

- Learn the need and applications of GIS in spatial planning.
- Get familiar with ArcGIS software and technical knowledge of basic tools.
- Learn GIS modelling for various kinds of spatial analysis.
- Acquire knowledge of integrating GIS with Digital Image Processing and GPS.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Apply GIS in spatial planning.

**CO2:** Use GIS for digital spatial data base creation.

**CO3:** Execute GIS modelling for various kinds of spatial analysis.

**CO4:** Utilise Digital Image Processing and use of GPS in spatial analysis.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module 1: Introduction to Geographic Information Systems (GIS)</b> Introduction to Geoinformatics, concepts and definitions of GIS; Components and functions of GIS; Understanding maps and layers; Understanding vector and raster datasets, map elements; Data types and requirements, sources of data and data handling techniques; Significance of GIS and its key application areas; Current developments and practices.	L1,L2	9
<b>Module 2: Introduction to GIS Software</b> Introduction to GIS software, exploring Graphical User Interface (GUI); Supporting files and formats; Identifying toolbar and available tools and techniques for performing spatial analysis; Introduction to geo-referencing, relevance of adding spatial information to scanned images, toposheets and satellite images; Understanding spatial and attribute data types; Creating a	L3,L4	9



project in GIS software, creating or adding layers; Digitization methods, organization of layers, importing and exporting data.		
<b>Module 3: Data Analysis Techniques</b> Understating data analysis tools and techniques; Learning tools and techniques available in the GIS software for spatial and attribute data analysis; Exercises on adding database in attribute table; Adding information from other sources; Creating charts and graphs; Statistics summary, calculating geometry, query builder, buffering or proximity analysis, and overlay analysis; Using relevant extensions for spatial analysis, 3D analysis, etc.	L3,L4	9
<b>Module 4: Displaying Data</b> Understating map elements, adding and changing symbology; Labelling and annotations; Creating map layouts; Inserting map scale, legend, title, north symbol; Creating grids and saving layouts; Printing and exporting maps as images.	L3,L4	9

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Victor Mesev (2007). *Integration of GIS and Remote Sensing*. John Wiley Publishing
- Harsan Karimi (2009). *Handbook of Research on Geo- informatics*, IGI Global Publishing
- Yeung, C.P.L.A. (2007). *Concept and Techniques of GIS*. Prentice Hall Publishing

### References

- Nath & Pandey, *Geo-informatics for decentralized planning and governance*, Rawat Publishing
- Wilson, J.P. (2008). *Handbook of GIS*. Blackwell Publishing

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--1	--2	--	--	--	--	--	--	--	1	1	1--	--
CO2	1	1	--	2	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	2	--	--	--	--	--	--	--	1	1	1	--
CO4	1	1	1	2	--	--	--	--	--	--	--	1	1	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING AND DESIGN LAB-IV (LANDUSE AND TRANSPORT PLANNING) (PLN2407)</b>	L	T	S	P	C
Version 1.1		0	0	10	0	10
Pre-requisites/Exposure	Planning and Design Lab I and II					
Co-requisites	Traffic and Transportation Planning-I					

### Catalog Description

With a mix of field visits and studio classes involving theory, the main objective of this subject is to teach students about techniques and methods of traffic and transportation planning required for the preparation of traffic circulation plan and mobility plan.

### Course Objectives

The objectives of this course are

- To appreciate the difference between travel demand and transport supply.
- to learn techniques for assessment, mitigation and management of traffic impact of current and proposed development.
- To understand key techniques for management and enhancement of transport supply.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Describe the different classifications of roads in urban and rural areas.

**CO2:** Conduct the surveys required for planning of a transportation system.

**CO3:** Layout the road network for designing the cities

**CO4:** Evaluate an area with respect to circulation plan with the help of surveys and geometric design

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module 1:</b> Area Mobility Plan with an objective to promote and make way for sustainable mobility patterns, improve accessibility and promote liveability. Travel Patterns Study involves analysis of the mobility profile of residents and workers within an area, modes used, trip lengths, trip purpose, etc. Origin destination survey includes analysis by comparing travel patterns with socio economic condition, housing typologies and private vehicle ownership. This will also include public opinion on traffic, noise, accessibility and local environment.	L1, L2	30
<b>Module 2:</b> Assessment of Travel Demand involves understanding of basic techniques for assessment of traffic impact of existing uses; Surveys and analysis related to traffic generation rates and patterns, parking demand, non-motorized traffic, traffic conditions on surrounding roads and intersections; Basic principles of travel demand modeling could be used to simulate	L1, L4	30

scenarios to test how change in the intensity of use of land could impact traffic in an area.		
<b>Module 3:</b> Transport Supply Analysis will diagnose the key transportation issues in an area by undertaking studies for analysing traffic volume, journey speed, parking, pedestrian movement and access to public transport. A study about the adequacy of transport infrastructure vis-à-vis travel demand studies undertaken earlier.	L1, L6	30
<b>Module 4:</b> Impact of transport on local environment involves analysis of noise, emissions, safety and quality of life; Developing indicators; Consideration of the needs of excluded groups such as children, elderly and women; Development of strategies consisting of planning, design and management measures.	L1, L4	30

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Kardiyali, L.R. (2011). Traffic and Transport Planning, New Delhi: Khanna Publishers.
- Khanna, S.K (2011). Highway Engineering, Roorkee: Nem Chand & Brothers.

### Reference Books

- Flaherty, O. (2006). Transport Planning and Traffic Engineering.
- Klosterman, R.E. (1990). Community Analysis and Planning Techniques, Lanham: Rowman & Littlefield Publishers.

### Modes of Evaluation: Assignment/Case Study/ Presentation/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	R-I	R-II	R-III	Report	CE	A	
Weightage (%)	50	50	50	40	05	05	200

R: Review, CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	1	1	--	--	--	1	--	1	--	--	--	1	1	1	--
CO2	1	1	1	2	--	--	1	--	1	--	--	--	1	1	1	--
CO3	1	1	1	2	--	--	1	--	1	--	--	--	1	1	1	--
CO4	1	1	1	2	--	--	2	--	1	--	--	--	1	1	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>REAL ESTATE DEVELOPMENT AND MANAGEMENT (PROFESSIONAL ELECTIVE- III) (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Housing and Community Planning					
Co-requisites	Planning and Design Lab – VI					

### Catalog Description

This course objective to provide the foundation, knowledge and skills needed to work in real estate sector. It is designed to build understanding of the complex interactions and uncertainties of the development process. It provides students with the essential knowledge components of economics, valuation, planning, law, and regeneration and sustainability principles. It also develops an appreciation of the skills and tasks inherent in development projects, including community participation, satisfying the statutory planning considerations, undertaking the necessary financial appraisals, and achieving funding to make it happen.

### Course Objectives

The objectives of this course are

- Introduce the basic Definitions and Concepts of Real Estate Planning and Management.
- Provide a basic understanding of Real Estate Markets.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the term land economics and evaluate the process and cost of development.

**CO2:** Describe the Heterogeneity and imperfections of land and valuation of real property

**CO3:** Identify the location of specific uses and urban development programme

**CO4:** Analyze the real estate development through case studies

Modules	Blooms level*	Number of hours
<b>MODULE 1: Developments of Land and Real Property</b> Economic concepts of land, objectives and scope of land economics; relevance for spatial planning; economic principles of land uses; economic rent, land use and land values, market mechanism and land use pattern. Process, cost of development, source of finance, and financial calculation for real estate developer. <b>Real Property Markets</b> Heterogeneity and imperfections, valuation of real property -principles and practices; private ownership and social control of land; disposal of land; land development charges and betterment levy; land use restrictions,	L1, L2	10

compensation and requisition taxation of capital gain on land versus public ownerships, economic aspects of land policies at various levels of decision making. <b>Factors Influencing Locational Decisions</b> Analysis of location of specific uses like residential, industrial, commercial and institutional in the light of location theories in intra-regional and inter-regional context; Techniques of cost benefit analysis of urban development programme.		
<b>MODULE 2: Project Work</b> Selection and understanding of case study by reviewing case studies from India and abroad on projects of various types covering different levels of planning and practical exercises on Environmental Impact Assessments. Formulation of aim and objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.	L1, L2	26

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- Sharma, Y. (2019). *Real Estate and Estate Planning*, Delhi : Prabhat Publication
- Mittal, S. (2018). *The ABC of Real Estate in India*, Chandigarh :White Falcon Publishing
- Jain, G.(2017). *Real Estate Investment & Financial Analysis*, Delhi:Anupam Printers and Publishers
- Baum, A. (2015). *Real Estate Investment: A Strategic Approach*, London: Routledge publisher

### **Reference Books**

- Prabhu, R. (2017). *The Real Estate (Regulation and Development) Rules 2017*, Maharsatra, MahaSeva
- Daithankar, J. (2016). *SAP Flexible Real Estate Management*, Berlin: Springer Publication

### **Modes of Evaluation: Assignment/Case Study/ Presentation/Class Test/Written Examination**

#### **Examination Scheme:**

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	1	--	--	1	2	--	--	1	--	--	1	--	1	2
CO2	1	1	2	--	--	--	1	--	--	1	--	--	1	--	1	--
CO3	1	1	--	--	1	2	1	1	--	--	--	--	1	--	1	2
CO4	1	1	--	--	1	--	1	1	--	2	--	--	1	--	1	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>URBAN GOVERNANCE AND MANAGEMENT (PROFESSIONAL ELECTIVE- I) (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Planning and Design Lab- IV					

### Catalog Description

As urban areas grow (area and population), complexity increases leading to creation of several major governance challenges facing these cities. On the top of it, the number of metropolitan cities is consistently increasing in India. Effective governance becomes a crucial issue for policy makers and planners. In this vein of thinking, the chief objective of this course is to teach effective governance and management of large cities by focusing on enhancing capacities of institutions and better administration of land assembly.

### Course Objectives

The objectives of this course are

- To understand the Significance of Governance in Urban Development
- To ascertain the Role of Governance in view of 74th Constitutions Amendment Act, 1992

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Demonstrate knowledge about the foundational ideas of urban governance including techniques and parameters of effective governance and management of large cities.

**CO2:** Make proposals for enhancing organizational capacities including better administration of land assembly

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Concepts of Management and Urban Management</b>            Definition of management; Decision Making: definition, features, factors, theories of decision making, essentials and hindrances in sound decision-making; decision makers and decision making bodies related to urban and regional planning at national, state and local level, Coordination, Importance of communications; elements, types, features and essentials of effective communications; Difference between public administration and urban management.</p> <p><b>Institutional framework and Devolution of local government</b>            Existing institutional and organizational framework for urban management in India; Distribution of responsibilities and activities among different levels as government and their special purpose bodies in the urban field; 74th CAA;</p>	L1, L2	10

Shift from urban management to urban governance; concepts and definitions; principles of good urban governance – participation, equity, efficiency, transparency and accountability, responsiveness, security, etc.; Indicators of good urban governance; good governance and planning; Good Governance Index, Citizens’ Charter, Service Level Benchmarking,		
<b>MODULE 2: Project Work</b> Selection and understanding of case study by reviewing case studies from India and abroad on projects of various types covering different levels of planning and practical exercises on Environmental Impact Assessments. Formulation of aim and objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.	L1, L2, L3	26

\*Bloom’s Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Baud, I.S.A. and de Wit, J. (eds.) (2008) *New Forms of Urban Governance in India: Shifts, models, networks and contestations*, Sage, New Delhi.
- Evenson, N. (1989) *Indian Metropolis: A View toward the West*, Yale University Press, Yale.
- Jenkins, R., Kennedy, L., Mukhopadhyay, P., and Pradhan, K. (2015) Special Economic Zones in India: Interrogating the Nexus of Land, Development and Urbanization. *Environment and Urbanization Asia*, Vol. 6, No. 1, pp. 1–17.
- Pinto, M.R. (2000) *Metropolitan City Governance in India*, Sage, New Delhi.
- Rao, N. (2007) *Cities in Transition, Growth, Change and Governance in Six Metropolitan Areas*, Routledge, London.
- Ruet, J. and Lama-Rewal, S.T. (eds.) (2009) *Governing India’s Metropolises: Case Studies of Four Cities*, Routledge, New York.

### Reference Books

- Shatkin, G. (ed.) (2013) *Contesting the Indian City: Global Visions and the Politics of the Local*, Wiley, London.
- Seshadri, T. (2012) An Analysis of the Feasibility of Private Land Assembly for Special Economic Zones in India, *Urban Studies*, Vol. 49, No. 10, pp. 2285-2300.
- Sivaramakrishnan, K. (2013) *Revisiting the 74th Constitutional Amendment for Better Metropolitan Governance*, Economic and Political Weekly, Vol. 31, No. 13, pp. 86–94.
- Sivaramakrishnan, K.C. and Maiti, A. (2009) *Metropolitan Governance in India: An Overview of Selected Cities*, East West Center, Honolulu

**Modes of Evaluation: Assignment/Case Study/ Presentation/Class Test/Written Examination**

### Examination Scheme:

Components	Internal Assessment	ESJ
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	<b>CT-1</b>	<b>CT-2</b>	<b>HA</b>	<b>S/P</b>	<b>CE</b>	<b>A</b>	
<b>Weightage (%)</b>	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	1	--	1	--	--	1	2	--	--	1	--	--	1	--	1	2
<b>CO2</b>	1	1	2	--	--	--	1	--	--	1	--	--	1	--	1	--
<b>CO3</b>	1	1	--	--	1	2	1	1	--	--	--	--	1	--	1	2
<b>CO4</b>	1	1	--	--	1	--	1	1	--	2	--	--	1	--	1	2

1: strongly related, 2: moderately related and 3: weakly related

	<b>READING AND COMPREHENDING SPACES (PROFESSIONAL ELECTIVE- I) (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Planning and Design Lab- IV					

### Catalog Description

The main objective of this course is to get students acquainted with various perspectives on space.

### Course Objectives

The objectives of this course are

- To understand the importance of space and approaches for place
- To identify the space with respect to gender, caste, region and religion
- To learn about the colonial and post colonial spaces

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Understand the idea of place and space and its relationship to city planning.

**CO2:** Demonstrate the ability to comprehend the forces active in the formations and transformations of spaces with a particular emphasis on identity, colonization and neoliberalism.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Approaches to Place and Space</b>  Meaning of place and space in planning; Geometries of space by Doreen Massey; Lefebvre's spatial practice, representation of space, spaces of representation; The Third Space of Edward Soja; Perspectives on space from Euclidian space to spaces of Lefebvre.</p> <p><b>Identity and Spaces</b>  Experiencing space through the lenses of gender, caste, region and religion; Multiplicity of linkages between identities and spaces; Dialectical relationship between identities and spaces; Shaping of built environments and identities.</p> <p><b>Colonial and Postcolonial Spaces</b>  Building of colonial cities and infrastructures such as roads and rail links; Control and dominance in the colonial spaces; Present day uses of colonial spaces; Nature of postcolonial spaces and national identity; Case examples New Delhi and Chandigarh, etc.</p> <p><b>Neoliberal Spaces</b>  Role of economic and political forces in producing space under neoliberalism; Characteristics of neoliberal spaces and how they shape city</p>	L1, L2	10

elements; Globalization and global cities; Planetary urbanization; Speculative urbanism; Case examples of reforms in the urban sector.		
<b>MODULE 2: Project Work</b> Selection and understanding of case study by reviewing case studies from India and abroad on projects of various types covering different levels of planning and practical exercises on Environmental Impact Assessments. Formulation of aim and objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.	L1, L2, L3	26

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- King, A. (1976) *Colonial Urban Development: Culture, Social Power and Environment*, Routledge and Kegan Paul, New York.
- King, A. (1989) Colonialism, Urbanism and the Capitalist World Economy, *International Journal of Urban and Regional Research*, 13(1), 1–18.
- Kumar, A., Vidyarthi, S. and Prakash, P. (2021) *City Planning in India, 1947-2017*, Routledge, New York.
- Massey, D. (2005) *For Space*, Sage, London.
- Hubbard, P. and Kitchin, R. (2011) *Key Thinkers on Space and Place*, Sage, London.

### Reference Books

- Lefebvre, H. (1991) *The Production of Space*, Blackwell Publishing, Oxford.
- Lefebvre, H. (2003) *The Urban Revolution*, University of Minnesota Press, London.
- Raju, S. (ed.) (2011) *Gendered Geographies: Space and place in South Asia*, Oxford University Press, New Delhi.

**Modes of Evaluation: Assignment/Case Study/ Presentation/Class Test/Written Examination**

### Examination Scheme:

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	1	--	--	1	2	--	--	1	--	--	1	--	1	2
CO2	1	1	2	--	--	--	1	--	--	1	--	--	1	--	1	--

<b>CO3</b>	1	1	--	--	1	2	1	1	--	--	--	--	1	--	1	2
<b>CO4</b>	1	1	--	--	1	--	1	1	--	2	--	--	1	--	1	2

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus - Fifth Semester

	<b>PLANNING AND MANAGEMENT OF UTILITIES AND SERVICES (PLN2502)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Planning and Design Lab – I & II					
Co-requisites	Planning and Design Lab – V					

### Catalog Description

This course gives a detailed information regarding planning and management of water supply, storm water, sewer, sanitation and solid waste management.

### Course Objectives

The objectives of this course are

- To introduce basics of Utilities and Services Planning
- To give exposure to Innovative Techniques for provision of Water Supply, Waste Water Treatment, Storm Water Management, Sanitation and Solid Waste Management, etc.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the role of planner in the management of services and utilities while assessing the storm water through proper layout design.

**CO2:** Demonstrate the importance of water and planning and management of water supply system.

**CO3:** Describe the need of planning as per demand and low-cost measure to tackle the sanitation issues

**CO4:** Review CPHEEO guidelines and explain the process of solid waste management including calculation of waste generation and area required for solid waste disposal.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Concepts and Terminologies in Infrastructure Planning</b> Role of physical planner in planning of urban, rural and regional infrastructure; Objectives of infrastructure planning and its implications for public health and environmental protection; Infrastructure networks at urban, rural, and regional level; Manual, code and standards for different infrastructure given by various agencies..	L1, L2, L3	9
<b>MODULE 2: Storm Water System</b> Understanding hydrology, its classification, hydrological cycle, urban water cycle; Types of precipitation and its measurement techniques, rainfall analysis; Surface water runoff, measurements of runoff, hydrograph,	L1, L2, L3	9

discharge from small and big rivers; Watershed planning and management; Flood frequencies, and flood protection measures in urban and rural areas; Layout and design of storm water systems; Rain water harvesting system at area level and beyond.		
<b>MODULE 3: Water Supply, Sanitation and Sewerage Systems</b> Sources of water and intakes; Treatment, quality and quantity, area requirements of components of water supply system; Water distribution system; Water requirements for different land uses, factors affecting water demand, per capita requirements and variations; Planning for various uses of water; Methods of sanitations; Off-site and on-site sanitation and technology; Low cost appropriate technologies; Standards for Indian cities; Sewerage system networks and layout planning; Sewage disposal methods, location criteria and capacity; Case studies of innovative sanitation approaches.	L1, L2, L3	9
<b>MODULE 4: Solid Waste Management and Other Services</b> Solid waste management in Indian cities, quantity of solid wastes and their characteristics; Methods of solid waste management, collection, transportation and disposal; Land filling, composting, and other methods of pre and post treatment; Location and cost aspects of different methods of solid waste disposal systems; Community participation and involvement of NGOs in efficient solid waste management; Telecommunication services: Locational criteria for mobile phone towers; Gas and oil pipelines; Electric substations requirements, capacity, location and space requirements	L1, L2, L3	9

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation*

### **Textbooks**

- Andy D. Ward, Stanley W. Trimble (2011). *Environmental Hydrology*, Second Edition: Lewis Publisher
- Garg, S.K. (2008). *Water Supply Engineering*, Delhi: Khanna Publisher
- Rangwala S.C. (2016). *Water supply and sanitary engineering*, Gujarat: Charotar Publishing House

### **References**

- George Tchobanoglous, Hilary Theisen, and S. A. Vigil (1993). *Integrated Solid Waste Management: Engineering Principles and Management Issues*: McGraw-Hill Education
- Parkin J. and Sharma D. (1999) *Infrastructure Planning*, T. Telford, London.
- Santen J.D. and Liptan, T.W. (2017) *Sustainable Storm Water Management: A Landscape Driven Approach to Planning and Design*, Timber Press, Portland, Oregon.
- Sperling M.V. (1996) *Wastewater Characteristics, Treatment and Disposal*, IWA Publishing, London.
- Chandrappa R., Das D.B. (2012) *Solid Waste Management: Principles and Practice*, Springer, Heidelberg.

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	2	--	--	--	2	--	--	--	1	1	--	--
CO3	1	1	--	2	--	--	--	2	--	--	--	1	1	--	--
CO4	1	1	--	2	--	--	--	2	--	--	--	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING LEGISLATION- I (PLN2503)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Planning Practice - I					
Co-requisites	Planning and Design Lab- V					

### Catalog Description

This course gives a detail idea of evolution, preparation and implementation of different legal aspects in Planning. This course helps gaining the understanding on issues and problems occurring in various transactions and make ways to resolve the issues and encouraging entire urban and regional development. Also, the course focuses on professional ethics and practices to be followed in planning profession.

### Course Objectives

The objectives of this course are

- To understand the basic Concept of Law and Indian Constitution.
- To understand the Roles, Responsibilities of various Plan Preparation and Implementation Authorities / Agencies.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the basic concept and need of law related to planning

**CO2:** Describe the different acts and laws enlisted in Indian constitution with respect to Planning.

**CO3:** Describe the need of acts relevant to planning and development and assess the legal aspect of land acquisition and related case studies.

**CO4:** Assess the role of different local and regional bodies responsible for plan implementation.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Concept of Law</b> Sources of law including custom, legislation and precedent; Meaning of the term of law, legislation, ordinance, bill, act, regulations and byelaws; Significance of law and its relationship to urban and regional planning; Benefits of statutory backing for planning at all levels.	L1, L2	8
<b>MODULE 2: Indian Constitution</b> Concepts and contents of the Indian Constitution, article 21; Rights and their implications for planning; Fundamental provisions regarding property rights; Overview of legal tools connected with urban and regional planning and development; Model town planning laws.	L1, L2,	7
<b>MODULE 3: Statutory Framework for Planning and Development Law</b>	L1, L2, L3, L4	12



Evolution of town planning legislation, town planning laws, town planning as a state subject; 73rd and 74th amendment and its implications for planning law; Current amendments in planning and development laws; Related laws such as environment and infrastructure laws.		
<b>MODULE 4: Statutory Framework for Land Acquisition and Assembly</b> Laws related to land assembly by public and private parties; Land acquisition legislations, eminent domain, police powers and concept of public purpose; Case studies highlighting nature of contentions, parties in dispute and decisions in specific planning disputes.	L1, L2	9

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4: Analysis; L5: Synthesis, L6: Evaluation

### Textbooks

- ITPI, *Planning Legislation and Professional Practice*, New Delhi
- GOI, (1996). *URDPFI Guidelines Volume 2A*, ITPI New Delhi
- Bijlani, H.U. *Law and Urban Land*, New Delhi

### References

- Bhargava G. (2002). *Development of India's Urban and Regional Planning in 21st Century: Policy Perspective*, Gyan Publishing House
- J Cameron Blackhall (2005). *Planning Law and Practice*, Taylor & Francis Ltd
- K. R. Gupta ,Prasenjit Maiti (2004). *Urban Development Debates in the New Millennium*, Atlantic Publishers; ISBN: 9788126903900

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	2	--	--	--	--	2	--	--	1	1	--	1
CO3	1	1	--	2	--	--	--	--	2	--	--	1	1	--	1
CO4	1	1	--	2	--	--	--	--	2	--	--	1	1	--	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>ECOLOGY, ENVIRONMENT AND RESOURCE DEVELOPMENT AND MANAGEMENT (PLN2511)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Environmental Studies-I & II					
Co-requisites	Planning and Design Lab- V					

### Catalogue Description

The aim of this course is to provide exposure to the students to basic concepts of ecology, ecosystems, environment and Resource Development. This course will enable the students a thorough understanding of all the theories and definitions of terms relating to ecology and environment in planning and their usage in urban and regional planning. The students will know about the impact of development on environment and its significance in planning.

### Course Objectives

The objectives of this course are

- To understand various types of components in Ecology, Environment.
- To the role of Ecology and Environment for the resource development and management.
- To enhance the knowledge for EIA. (Environment Impact Assessment)

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define the meaning and scope of ecology and identification of ecological parameters for planning at different levels.

**CO2:** Understand the ecosystem and its relevance to environment in planning.

**CO3:** Understand the concept of environmental impact assessment and its role in planning and development.

**CO4:** Learn the various environmental policies in planning.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module 1: Comprehending Ecology</b> Meaning and scope of ecology; Evolution of ecology, components of nature and basic concepts and processes of ecology; Resources and human settlements' impact on advanced agricultural methods, urbanization and industrialization of nature; Urban ecosystem approach, its evolution and significance; Soil, water, land, vegetation and energy resources and their development and management; Defining ecologically sensitive areas, ESA as a resource for development; Impact of development on coastal areas,	L1, L2, L3	8

forests, hills and river ecology; Legislation and policies for the management of ecologically sensitive regions; Case studies for the management of ecologically sensitive areas in India.		
<b>Module 2: Quantitative Ecology</b> Introduction to quantitative ecology; Identification of ecological parameters for planning at different levels like site planning, settlement planning and regional planning; Data needs and formats for data collection; Types of analysis required for evolving ecological parameters; Ecological footprints and carrying capacity.	L1, L2, L3	9
<b>Module 3: Climate Change</b> Cities and climate change; Impact of built environment and transportation on greenhouse gas emissions; Role of planning in climate change mitigation and adaptation; Management tools for sustainable retrofitting infrastructure; Critical review of policies and regulations in India regarding climate change; Examples of climate change plans where mitigation and adaptation strategies are translated into concrete actions; Emerging technologies; National policy framework on climate change, carbon credits and trade, carbon footprints.	L1, L2, L3	9
<b>Module 4: Resource Planning Development and Management</b> Endowments, types of resources, exhaustive and renewable resources development; Utilization and conservation of national, technological and human resources; Resource management, recycling of resources and resource equilibrium; Water resource management, waste land management; Rural industrialization and use of non-conventional energy in rural development; Major resource development programmes in India; Case studies of resource development projects in agriculture, forestry, minerals, water, etc.	L1, L2, L3	10

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Kumar, Pranav. (2017). Fundamentals of Ecology and Environment. *Pathfinder Publication*.
- Sharma, P. D. (2017). Ecology and Environment. *Rastogi Publications*.
- Raman, N. S., Gajbhiye, A. R. & Khandeshwar, S. R. (2019). Environmental Impact Assessment. *Dreamtech Press*.

### Reference Book

- Schneider, David C. (1994). Quantitative Ecology Spatial and Temporal Scaling. *Academic Press Inc*.
- Royle, J. Andrew & Dorazio, Robert M. (2009). Conceptual and philosophical considerations in ecology and statistics. *Hierarchical Modelling and Inference in Ecology*, 1-26. <https://doi.org/10.1016/B978-0-12-374097-7.00003-X>

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination****Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	2	--	--	--	1	--
CO2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CO3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
CO4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>HOUSING AND COMMUNITY PLANNING (PLN2510)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Planning and Design Lab II					
Co-requisites	Planning and Design Lab V					

### Catalogue Description

This is an introductory course to housing. The objectives of the course are to provide students with an understanding of nature of housing problems and how housing need is assessed and how government policies and development regulations affect housing outcomes particularly for the poor.

### Course Objectives

The objectives of this course are

- To study the housing in National Development Goals; Equity and efficiency parameters of housing; Current issues in housing
- To study the housing development process in India – plan and policies / schemes etc
- To study the housing standard and design in India context

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Discuss the importance and usage of housing.

**CO2:** Describe the terms related to housing.

**CO3:** Describe housing processes in detail.

**CO4:** Describe the housing standards and policies in India.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module I: Introduction</b> Housing: definition, housing as a verb and noun; Housing in relation to planning; Concepts of housing stock, need, demand, shortage; An overview of housing situation; Urban and rural housing scenario in India; Housing as a component of social and economic development; Key challenges of housing provision including housing for the poor, emergence of slums, unauthorised colonies, gentrification, displacement.	L1, L2	8
<b>Module II: Housing Project Formulation</b> Understanding the community; Determinants of housing form including physical, social, economic, technical and aesthetic; Development options and housing; Housing costs, standards, densities and FAR; Housing projects and city level housing provisions.	L3	10
<b>Module III: City Level Housing Studies</b> Components of housing, housing subsystems; Administrative, legal and financial frameworks for housing development; Processes of housing	L1, L2	8

development; Analysis of housing stress; Concepts of affordability and target identification.		
<b>Module IV: Policy and Legislative Framework</b> Evolution of housing policy in India; Components of housing policy at national and state level; Approaches to housing provision for the poor, special groups and other vulnerable groups.	L1, L2	10

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Textbooks:

- Rhonda Phillips and Patsy Kraeger (2017): Community Planning and Development
- Sam Davis (1997): The Architecture of Affordable Housing
- Verma, G.D. (2001) *Slumming India*, Penguin, New Delhi.

### References:

- Hardoy, J.E. and Satterthwaite, D. (1989) *Squatter Citizen: Life in the Urban Third World*, Routledge, London.
- Cedric, P. (1990) *Housing and Urbanisation: A Study of India*, Sage, New Delhi.
- Kohli, V.K. (2007) *Housing Finance Agencies in India*, Deep and Deep, New Delhi.
- Jenkins, P., Smith, H. and Wang, Y.P. (2007) *Planning and Housing in the Rapidly Urbanizing World*, Routledge, New York.

### Modes of Evaluation: Literature Study/ Case Study/ Presentation/ Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2	--	--	--	--	--	--	2	--	--	2	1	--
CO2	1	2	1	2	--	--	--	--	--	--	2	--	--	2	1	--
CO3	1	2	1	2	--	--	--	--	--	--	2	--	--	2	1	--
CO4	1	2	1	1	--	--	--	--	--	--	2	--	--	2	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING AND DESIGN LAB - V (SUB CITY PLAN) (PLN2507)</b>	L	T	S	P	C
Version 1.1		0	0	10	0	10
Pre-requisites/Exposure	Planning and Design Lab I, II, III & IV					
Co-requisites	Planning Legislation, PMUS					

### Catalog Description

This studio provides a link between site level and city level plans. This level details out land allocations and planning proposals given in statutory plans at the city level. It should help students to see interrelations amongst different sectors at the city level and how these need to be translated through detailed plans so as to achieve city level statutory plan objectives.

### Course Objectives

The objectives of this course are

- To study plan preparation and its relationship of higher order plan with lower order plans such as Master Plan with Zonal Plan and Area Plan.
- To develop the lower order plan within the framework of Master Plan.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Describe the different approaches in plan making; the concepts of master plan, comprehensive development plan - the structure plan, the sector plan, the area/ zonal plan, and other types of plan making processes and relationship among plans.

**CO2:** Evaluate a master plan, zonal plan or any area plan.

**CO3:** Use the relevant planning standards for different land uses for area planning.

**CO4:** Prepare methodology and collect data for site planning such as land use survey, household's survey etc., and analyze the data for area plan.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Approaches to Plan Making and Relationship among Plans</b> The different approaches to plan making; the concepts of master plan, comprehensive development plan - the structure plan, the sector plan, the area/ zonal plan, and other types of plan making processes, Relationship of higher order plans with lower order plans	L1, L2	16
<b>MODULE 2: Framework for Zonal Plans</b> The approach to developing the area/ zonal plan within the framework of Master Plan.	L2, L3, L4	15
<b>MODULE 3: Planning Standards</b> The study and development of the relevant planning standards for different land uses	L4, L5	15
<b>MODULE 4: Zonal Plans / Area Plans</b>	L5, L6	50

Detailing of specific sites in the proposed Zonal Plans / Area Plans, covering different land uses.		
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\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books / References

- MoUD, (2015): *Urban and Regional Development Plans Formulation and Implementation* (URDPFI) Vol. 1, Ministry of Urban Development, Government of India, Delhi
- MoUD, (2015): *Urban and Regional Development Plans Formulation and Implementation* (URDPFI) Vol. II A and Vol. IIB, Appendices to URDPFI Guidelines, 2014, Ministry of Urban Development, Government of India, Delhi

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	R-I	R-II	R-III	Report	CE	A	
Weightage (%)	50	50	50	40	05	05	200

R: Review, CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	1	1	--	--	--	--	--	--	--	1	1	--	--
CO4	1	1	1	1	1	1	1	1	1	1	--	1	1	1	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>DISASTER RISK MANAGEMENT AND CLIMATE CHANGE ADAPTATIONS (PROFESSIONAL ELECTIVE- III) (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Ecology, Environment and Resource Development and Management					
Co-requisites	Planning and Design Lab – VI					

### Catalog Description

This course aims at developing a systematic understanding for identifying, assessing and reducing the risks of disaster. It helps in assessing physical, socio-economic and environmental vulnerabilities and mitigation mechanisms for various types of disasters. The course also aims at giving a general understanding of climate change and strategies for mitigating the effects of climate change.

### Course Objectives

The objectives of this course are

- To understand the basic concepts of disaster management.
- To understand disaster management mechanisms; disaster risk mitigation; and post disaster measures
- Explain the fundamentals of climate change science.
- Present the international climate change legal and policy framework and explain key issues under negotiation.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the concepts, prevention strategies and post disaster management for various types of disasters.

**CO2:** Describe the role of government authorities and others organizations in disaster management

**CO3:** Explain the basic concepts of climate change science and analyse different climate change scenarios and their implications

**CO4:** Explain the importance and mechanisms of adaptation in preparing for and coping with climate change

Modules	Blooms level*	Number of hours
<b>MODULE 1: Basic Concepts of Disaster Management</b> Disaster –related terms, definitions, concepts; Types and classifications of disasters- causes and consequences; Overview of disasters across the world;	L1, L2	10

<p>Disaster management cycle, Phases of disasters; Disaster Vulnerability: physical vulnerability, socio-economic vulnerability, environmental vulnerability; Disaster Risk Mapping; Emergency phase of disasters; Disaster Rescue and Relief; Post disaster recovery and rebuilding process</p> <p><b>Disaster Management Mechanisms</b></p> <p>Recent initiatives at national and state level; Kyoto Framework of disaster mitigation and management; Disaster Management Act – national and states; Roles and Responsibilities of National Disaster Management Authority, State Disaster Management Authorities, District Disaster Management Authorities; Various role players in disaster management – NGOs / CBOs and Armed Forces; Community Based Disaster Preparedness (CBDP); Physical planning and disaster management plans; Applications of Remote sensing and GIS in disaster management.</p> <p><b>Climate Change Adaptations</b></p> <p>Introduction to the concept of climate change adaptation; Assessing climate vulnerability; Introduction to linkages between climate change adaptation and development; Important international adaptation initiatives and programmes; International climate change negotiations; The 4 United Nations Framework Convention on Climate Change (UNFCCC); The Kyoto Protocol and its associated bodies</p>		
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study by reviewing case studies from India and abroad on projects of various types covering different levels of planning and practical exercises on Environmental Impact Assessments. Formulation of aim and objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L1, L2,	26

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Christian N. Madu, (2017). *Handbook of Disaster Risk Reduction & Management: Climate Change And Natural Disasters*
- Damon P Capolla, (2007). *Introduction to international Disaster Management: Butterworth Heinemann*
- Klijn, F.(2012). *Comprehensive Flood Risk Management: Research for Policy and Practice*
- Wisner, B., Blaikie, P. M., Cannon, T., Davis, I. (2004) 'At Risk: Natural Hazards, People's Vulnerability and Disasters' Psychology Press, ISBN 0415252164, 9780415252164

### References

- Blakie, P., Cannon, T., Davis, I. and Wisner, B. (1994), 'At Risk: Natural Hazards, People's Vulnerability and Disasters', Routledge, London

- Cannon, T. (2000). Vulnerability Analysis in Disasters. In: D. Parker, ed., Floods, pp. 43-55. London
- Coburn, A. and Spence, R., (2002) 'Earthquake Protection', John Wiley & Sons, Ltd, England
- Dowrick, D. (2003) 'Earthquake Risk Reduction', John Wiley & Sons, Ltd, England.
- George D Haddow and Jane A Bullock, (2006). *Introduction to Emergency Management*: Elsevier Butterworth Heinemann
- IISD, UNITAR & UNEP (2009). IEA Training Material: Vulnerability and Climate Change Impact Assessment for Adaptation.
- NDMA, (2007-11). *Disaster Management Guidelines*: New Delhi
- UNDP (2004) 'Reducing Disaster Risk: A Challenge for Development' United Nations Development Programme, ISBN 92-1-126160-0 Available: [http://www.undp.org/cpr/whats\\_new/rdr\\_english.pdf](http://www.undp.org/cpr/whats_new/rdr_english.pdf)
- UNEP & UNDP (2011). Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>INFOGRAPHIC TECHNIQUES FOR REPRESENTATION OF DATA (PROFESSIONAL ELECTIVE- II) (PLN2513)</b>	L	T	S	P	C
Version 1.1		0	0	3	0	3
Pre-requisites/Exposure	Planning and Design Lab I, II, III & IV					
Co-requisites	Planning and Design Lab V					

### **Catalog Description**

The aim of this course is to offer opportunities and skillset in effective infographics and storytelling techniques. This particular subject will be greatly useful in planning and producing effective studio sheets. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course will evolving rationale thinking capabilities of the students with respect to delivering students' findings/insights and the best presentation method. The course would be conducted through literature survey, case studies, and hands on exercises with available infographic software in the university. During the course, students will be working in interdisciplinary groups. In this course, students will discuss how to incorporate a story in their presentation to help them capture the attention of the audience. They will be able to choose and apply the most effective analytical method for delivering their insights/ideas. They will incorporate data visualization best practices and use tips and tricks when presenting at various platforms to decision makers and stakeholders.

### **Course Objectives**

The objectives of this course are

- To equip students with effective utilization of infographic techniques.
- To demonstrate effective presentation skills and deliver insights

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Apply story telling techniques in planning studio presentations.

**CO2:** Synthesize research findings and develop effective insights

Modules	Blooms level*	Number of hours
<b>MODULE 1: Synthesizing the Findings and Deriving the Insights</b> Synthesizing findings of student research and derive valid/actionable insights, Finding story in the data, Shaping it to contribute to a compelling research presentation, Providing actionable comparisons, Weighing the pros and cons, Deriving insights to address a problem/problems, Methods for developing research-based recommendations, testing and refining ideas. Techniques of reviewing the essential sections of various reports, designing visualizations of data, Understanding the requisite for targeting specific audience, Applying storytelling strategies, Recognize the drawbacks of poor data visualization.	L3, L4 L5	12
<b>MODULE 2: Project Work</b> Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.	L4, L5, L6	24

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Cairo, A. (2012). Chapter 1 Introduction Infographics and Visualization. *Functional Art - Infographics and Visualization and Exploration*.
- Walter, E., & Gioglio, J. (2014). *The Power of Visual Storytelling: How to Use Visuals, Videos, and Social Media to Market Your Brand*. Inside Market Data (p. 256).
- Tong, C., Roberts, R., Borgo, R., Walton, S., Laramée, R. S., Wegba, K., ... Ma, X. (2018). Storytelling and visualization: An extended survey. *Information (Switzerland)*, 9(3). <https://doi.org/10.3390/info9030065>

### References

- Cairo, A. (2012). Infographics and Visualization and exploration. *The Functional Art*, 15–25. Retrieved from <http://www.thefunctionalart.com/>
- Smiciklas, M. (2012). *The Power of Infographics: Using Pictures to Communicate and Connect with Your Audience*. *The power of infographics* (pp. 1–17). <https://doi.org/10.4324/9780203075609>

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>ECO-TOURISM (PROFESSIONAL ELECTIVE- II) (PLN2514)</b>	L	T	S	P	C
Version 1.1		0	0	3	0	3
Pre-requisites/Exposure	Disaster Risk Management and Climate Change Adaptation					
Co-requisites	Planning and Design Lab V					

### Catalog Description

The aim of this course is to offer the principles of planning for eco-tourism in the context of sustainable tourism development. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course is getting the insights of relationships between tourism and environment, tourism and urban development, tourism and economic development. In this course, students will be able to grasp planning requirements for developing sustainable eco-tourism hubs and circuits. They will be able to incorporate community needs and sustainable eco-tourism requirements in planning process. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### Course Objectives

The objectives of this course are

1. To apply planning strategies and tools with reference to sustainable tourism development.
2. To grasp the role of public and private sector as well as community participation in eco-tourism planning and development

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Apply concept of eco-tourism for sustainable tourism development.

**CO2:** Identify and plan eco-tourism hubs and circuits.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction and Planning for Eco-Tourism</b>            Definitions, scope, nature, key determinants, characteristics; problems and prospects of eco-tourism; eco-tourism hubs in India; impacts of eco-tourism in developed and developing regions; relationship between tourism and urban development, relationship between tourism and economic development, relationship between tourism and environment; concept of carrying capacity and its significance in eco-tourism. Circuit identification and destination planning; assessment of infrastructure requirement for eco-tourism planning; analysing tourism impacts in transforming local livelihood and lifestyle; role of Government institutions and agencies in eco-tourism development.</p>	L3, L4 L5	12

<b>MODULE 2: Project Work</b> Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.	L4, L5, L6	24
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*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Cohen, E. (1978). The impact of tourism on the physical environment. *Annals of Tourism Research*, 5(2), 215–237. [https://doi.org/10.1016/0160-7383\(78\)90221-9](https://doi.org/10.1016/0160-7383(78)90221-9)
- Dávid, L. (2011). Tourism ecology: Towards the responsible, sustainable tourism future. *Worldwide Hospitality and Tourism Themes*, 3(3), 210–216. <https://doi.org/10.1108/17554211111114217>
- Ghasemi, M., & Hamzah, A. (2014). An Investigation of the Appropriateness of Tourism Development Paradigms in Rural Areas from Main Tourism Stakeholders' Point of View. *Procedia - Social and Behavioral Sciences*, 144, 15–24. <https://doi.org/10.1016/j.sbspro.2014.07.269>

### References

- Jaini, N., Anuar, A. N. A., & Daim, M. S. (2012). The practice of sustainable tourism in ecotourism sites among ecotourism providers. *Asian Social Science*, 8(4), 175–179. <https://doi.org/10.5539/ass.v8n4p175>
- Stakeholders, E. (1994). The Component of Successful Ecotourism. In *UNEP Division of Technology, Industry and Economics* (pp. 33–59).
- Wiltshier, P., Clarke, A., Adebayo, A., Robinson, P., & Oriade, A. (2019). Community-based tourism. In *Community-Based Tourism in the Developing World* (pp. 98–112). Routledge. <https://doi.org/10.4324/9781351026383-8>

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury



### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PROFESSIONAL TRAINING– I (PLN2508)</b>	L	T	S	P	C
Version 1.1		0	0	0	0	2
Pre-requisites/Exposure	Planning and Design Lab I, II, III & IV					
Co-requisites	Planning and Design Lab – V					

### **Catalog Description**

Each student shall undertake Mandatory Training in a planning (or related) office during summer vacation between the Sixth and Seventh semester. The period of Training will be eight weeks. The exact period and place of training will be decided in consultation with the Co-ordinator-in-charge of training. The objective of Training is to expose the students to live planning projects and working environment at planning offices. The students are required to submit a ‘Satisfactory’ certificate from the relevant Planning Office after completion of training. The student will also submit a Report highlighting the Profile of the Planning Office, its organization, key work areas, etc; Introduction to the project(s) worked upon during training; planning brief; methods employed; and planning -design solutions / proposals. The students will also be required to present their work through drawings / visuals, power point presentations in the form of a Seminar to the faculty and students of the Department over the seventh semester, as per directions of the Co-ordinator-in-charge of training.

### **Course Objectives**

The objectives of this course are

- To understand the profile of the Planning Office / Planning Authority / Local Body / Planning Professional.
- To participate in a Live Project of Planning Office / Planning Authority / Local Body / Planning Professional

## Syllabus - Sixth Semester

	<b>ENVIRONMENTAL PLANNING (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Ecology, Environment and Resource Development & Management					
Co-requisites	Planning and Design Lab- VI					

### Catalog Description

The aim of this course is to study different aspects of environment planning in detail. Also, this will expose students to diverse concepts of sustainable development, community based environmental planning, environmental justice, and global environmental challenges. area.

### Course Objectives

The objectives of this course are

- To understand about the sustainable development and its diverse interpretations
- To learn about the land use planning and community based environmental planning

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain sustainable development and its diverse interpretations

**CO2:** Establish a relationship between land use, infrastructure, and natural environment

**CO3:** Explain about the integration of sustainable development and other environmental theories into a development plan

**CO4:** Demonstrate knowledge and skills to prepare environmental plans for human settlements

Modules	Blooms level*	Number of hours
<b>Module 1: Sustainable Development</b> Origin of the term sustainable development and its diverse interpretations; Role of different actors from bottom-up to top-down, weak versus strong sustainability; Participatory challenges: green democracy versus participatory managerialism; Mainstreaming of sustainable development and its integration with development; Sustainable development agenda and different models of planning: planning models which emphasise delivery against sustainability targets i.e. linear rational model, those which emphasise collaboration i.e. integration of different forms of knowledge and expertise, and those which see planning as arena for debate and emphasise learning for sustainability.	L1, L2	6
<b>Module 2: Land Use Planning and Community-based Environmental Planning</b>	L1, L2	11

Relationship between land use, infrastructure and natural environment; Land use and environmental protection; Community-based environmental protection; Ecosystem management; Integrated water resource management; Hazard mitigation; Ecological restoration; Land conservation; A bottom-up approach; Responsive and context-sensitive plans incorporating local knowledge, enhancing local ownership; Define communities and understanding inequalities within communities; Capacities of communities; Relationships with other scales for environmental planning.		
<b>Module 3: Environmental Justice and Land Use Planning</b> Origins of environmental justice movements; Understanding location of polluting industries in ethnic minority neighbourhoods; Distribution of environmental ills and benefits by using GIS mapping; Recognition of diversity and identities of actors; Procedural and distributive justice and participation; Economic, social and political processes in urban and regional development for creating more environmentally just society; Urban and rural poor in developing countries and environmental justice issues; Environmental Impact Assessment in India; Introduction to Strategic Environment Assessment.	L4	9
<b>Module 4: Global environmental problems and local planning</b> Debates over climate change, forests and biodiversity depletion, water scarcity and food scarcity; International environmental negotiations and treaties like 1987 Montreal Protocol, 1992 Rio Convention on Biological Diversity, 1997 Kyoto Protocol, MDGs, SDGs, etc.; Local environmental planning issues like green building certification, non-motorised transportation infrastructure, rainwater harvesting, grey water recycling, urban agriculture, etc.	L1, L2	10

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Pekmezovic, A., Walker, G. and Walker J. (2019) *Sustainable Development Goals: Harnessing Business to Achieve the SDGs through Finance, Technology and Law Reform*, John Wiley and Sons, New Jersey.
- Randolph, J. (2003) *Environmental Land Use Planning and Management*, Island Press, Washington D.C.
- Amanda, K. (2017) *Environmental Justice and Land Use Conflict*, Taylor and Francis, London.
- Gupta, K.R. and Maiti, P. (2009) *Global Environment: Problems and Policies*, Atlantic Publisher, New Delhi.

### Reference Books

- Emmanuel Mutale (2017): *The management of urban development in Zambia*
- S K Kulshrestha (2018): *Urban Renewal in India : Theory Initiative and Spatial Planning Strategies*
- Sameer Sharma (2008). *Smart Cities Unbundled*

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	--	1	--	1	1	--	--	--	--	--	--	--
CO2	1	--	2	--	--	3	--	1	1	--	--	--	--	--	--	1
CO3	1	--	1	--	--	3	--	--	--	--	--	--	1	--	--	1
CO4	1	--	2	1	--	1	--	--	--	--	--	--	1	--	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING AND MANAGEMENT OF INFORMAL SECTORS (PLN2605)</b>					L	T	S	P	C
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Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Planning and Design Lab – V (Area Planning)					
Co-requisites	GIS for Planning, Planning and Design Lab – VI (Urban Development Plan)					

### Catalog Description

The aim of this course is to study the problems and issues of urban informal sector along with its planning and management. The course provides an overview of different dimensions of urban poverty, concept of basic needs, various approaches for delivery of basic services to the urban poor. Student will be able to learn design layout for infrastructure services and amenities for urban poor and their implication in physical planning. The course also deals with the migratory impulses and factors behind spontaneous living and working in urban context.

### Course Objectives

The objectives of this course are

- To study the concept and dimensions of urban poverty.
- To study migratory impulses and impact on informal sector.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain various dimensions of poverty and urban poverty alleviation programmes.

**CO2:** Identify basic needs of poor and their provision for target groups and discuss community planning and institutional approach for delivery of basic services to urban poor.

**CO3:** Explain the characteristics of migrants and assess their association with growth of informal sector.

**CO4:** Describe planning and development of urban settlements in respect of the spontaneous growth.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Urban Poverty</b> Dimensions of urban poverty, magnitude of problem, urban poverty alleviation programmes, impact of macro-economic structural adjustment policies on poor urban households.	L1, L2	5
<b>MODULE 2: Basic Needs and alternative approaches for Delivery of Basic Services to Urban Poor</b> Development of the concept of basic needs; identification of basic needs and their provision for various target groups and informal sectors; standards for basic needs, NGO's and voluntary organizations associated with provision of	L1, L2, L3	8

basic needs. Community planning approach, low cost alternatives and institutional reforms approach.		
<b>MODULE 3: Migratory Impulses and Impact on Informal Sector</b> Characteristics of migrants and their association with growth of informal sector; socio-economic deprivation and informal sector; development of informal sector concept; Role of informal sector in housing stock, economy, commercial activities, etc.; Implications in physical planning.	L1, L2	6
<b>MODULE 4: Consequences of Spontaneous Growth</b> Study of major aspects; spontaneous living and working, their characteristics and functions in urban context, actions for improvement; appraisal of the role of government, private and voluntary organizations; existing management; their organizational set-up and limitations; planning and development of urban settlements in respect of the spontaneous growth; case studies from India and other developing countries.	L1, L2, L4	5

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books**

- Chauhan S., Mukhopadhyaya U. (2010), Revisiting the Informal Sector, Springer.
- Samal K. (2008), A General Equilibrium Approach, Informal Sector Concept, Dynamics Linkages and Migration, Concept Publishing Company, New Delhi.

#### **Reference Books**

- E.J. Blakely, R.J. Milano (2001), Community Economic Development, International Encyclopedia of the Social & Behavioral Sciences.
- Lawson, D. (2010), What Works For The Poorest?, Practical Action Publishing.

#### **Modes of Evaluation: Presentation/ Assignment/Class Test/Written Examination**

#### **Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### **CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	1	1	1	2	--	1	1	--	--	--	1	--	1	--	1	2
<b>CO2</b>	1	1	2	2	--	1	1	--	--	--	1	--	1	--	1	2
<b>CO3</b>	1	1	2	2	--	1	1	--	--	--	1	--	1	--	1	2
<b>CO4</b>	1	1	2	2	--	1	1	--	--	--	1	--	1	--	1	2

1: strongly related, 2: moderately related and 3: weakly related



	<b>PLANNING AND DESIGN LAB – VI (URBAN DEVELOPMENT PLAN) (PLN2607)</b>	L	T	S	P	C
Version 1.1		0	0	8	0	8
Pre-requisites/Exposure	Planning and Design Lab – V					
Co-requisites	Metropolitan Planning, Development and Management					

### Catalog Description

The aim of this course is to impart knowledge and Hands-on Skills for Conducting various Field Surveys; Analysis Data and preparation of Urban Development Plans. This course will also focus on various types and hierarchy of Urban Plans, their Characteristics and Contents. It will also help students to evolve Development Policies; Land Use Plan, priorities and Implementation Mechanism for a selected Urban Area.

### Course Objectives

The objectives of this course are

- To introduce different parameters of UDP.
- To collect necessary data from their field visit and surveys.
- To use different methods to conduct survey and also to learn different ways to do data analysis.
- To have a different perception and understanding to how local people are approaching development plan.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Describe the contents of various types of development plans and prepare questionnaire required for Urban Development plan preparation.

**CO2:** Conduct the survey and collect data from their respective sectors.

**CO3:** Evaluate the area based on the data collected

**CO4:** Propose the policy based guidelines and recommendation for further development.

Modules	Blooms level*	Number of hours
<b>Module 1: Studying Development Plans and Gathering Secondary Source Information for a Selected City</b> The study shall involve understanding of contents of various types of development plans and explore their foci; Identification and preparation of secondary source information of the towns or cities selected for the study.	L1, L2	21
<b>Module 2: Organization of Field Surveys</b>	L2, L3, L4	15

Visit to the case study area, collection of primary and secondary data and information on various aspects such as demography, social, economic, housing, transportation, etc.; conduct of primary and secondary surveys.		
<b>Module3: Analysis and Synthesis</b> Analysis and synthesis of data and information collected on various aspects; projections of population and workforce; trends and issues identification.	L4, L5	40
<b>Module 4: Plan, Policies and Proposals</b> Preparation of policies and proposals with different scenarios and identification of priorities and action areas; phasing and monitoring; governance structures for implementation; land use plan and the plan document.	L5, L6	20

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books/ References

- Government of India. (1996). UDPFI Guidelines, ITPI, New Delhi
- Dr. L.R. Kadiyali (2016). *Transportation Engineering*, Khanna Publishing
- Delhi Development Authority. (2010). *Master Plan for Delhi 2021*
- CIDCO. (2008). *Navi Mumbai Development Plan*

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	R-I	R-II	R-III	Report	CE	A	
Weightage (%)	50	50	50	40	05	05	200

R: Review, CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	--	1	--	--	--	--	--	1	1	1	--	--
CO2	1	1	--	--	1	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	1	1	1	--	--	--	--	--	--	1	1	1	1	1
CO4	1	1	1	1	1	--	--	--	1	--	--	1	1	1	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>METROPOLITAN PLANNING, DEVELOPMENT AND MANAGEMENT (PLN2608)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Introduction to Regional Planning					
Co-requisites	Planning and Design Lab – VII (Regional Planning)					

### Catalog Description

The Course deals about the development of a region because a city can't flourish its own. The course gives the understanding to study the characteristics of a region, nature, components and spatial patterns. It also discusses about the tools and constraints in the implementation of metropolitan development plan in terms of administration, legal and financial aspects.

### Course Objectives

The objectives of this course are

- To understand the Process of Metropolitanisation and Evolution of Metropolitan Cities and their respective Regions using Case Studies.
- To introduce the Techniques of Delineation of Metropolitan Regions and study their Structure, Form and Characteristics with the help of Case Studies

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the concept of Metropolitanisation and its regional structures

**CO2:** Explain the Forms and concepts for metropolitan planning and development.

**CO3:** Identify the different hierarchy of growth poles and growth centres in regional planning.

**CO4:** Explain the need of special planning for special regions through different case studies

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Metropolis and its Region</b> Introduction to metropolis and related concepts, growth and scale; Complexities: social, economic, physical and administrative; Metropolitanisation in India: general trends and distribution; Issues and problems in metropolitan planning and development. Service area of a metropolis; Metropolis as a primate city; Metropolitan region and delineation techniques; Metropolitan regional structures: characteristics, components and spatial patterns	L1, L2	11
<b>MODULE 2: Forms</b> Metropolitan centralization and decentralization processes; Concepts of ring and satellite towns, counter-magnets; Forms and concepts for metropolitan	L1, L2	8

planning and development: Sheet, Galaxy, Core, Star, Ring and Multi-nucleated; Merits and demerits; Efficient functioning of metropolis		
<b>MODULE 3: Metropolitan Planning, Development and Management Strategy</b> Metropolitan planning: spatial planning studies and surveys; Concepts and techniques of preparation of metropolitan city plans; Metropolitan planning, development and management strategies at regional and settlement levels; Tools and constraints in the implementation of metropolitan development plan in terms of administration, legal and financial aspects; Role and function of public participation.	L1, L2	9
<b>MODULE 4: Case Studies in Metropolitan Planning and Development</b> Metropolitan planning, development and management in India; Appraisal of planning and development efforts in case of some of the metropolises, viz. Kolkata, Mumbai, Delhi and Chennai, etc	L1, L2	8

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation*

#### **Text Books /**

- ITPI, *City and Metropolitan Planning and Design*, ITPI, New Delhi
- Ramachandran, R. (1998). *Urbanisation and Urban Systems in India*: Oxford University Press, New Delhi
- Bawa V.K. (1987). *Indian Metropolis: Urbanisation, Planning and Management*: Inter-India Publications, New Delhi

#### **References**

- MMRDA, (1991). *Madras 2011: A New Perspective for Metropolitan Management*: MMRDA, Chennai
- NCRPB, (2005). *Regional Plan 2021*: New Delhi

#### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

#### **Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

## CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO4	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>REGIONAL PLANNING AND MANAGEMENT (PLN2609)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning					
Co-requisites	Planning and Design Lab – VII (Regional Planning), Metropolitan Planning, Development and Management					

### **Catalog Description**

The aim of this course is to study the concepts, characteristics and process of regional planning. This course gives a detail idea of evolution, preparation and implementation of regional planning in India. A regional plan takes into account the economic, spatial and environmental goals and tries to address national level issues. It mainly focuses on resources management and economic development of a region for its balanced growth. This course also has some case study of how regional plans were prepared and what was the need behind the preparation of regional planning.

### **Course Objectives**

The objectives of this course are

- Understand Regionalization and Growth of Regions and study their Nature, Types and Structure using Case Studies
- Identify Regional Planning Process through different case studies.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Explain the contribution of regional development in regional economy

**CO2:** Describe the different scopes of regional plans at district level, state level, sub-national level and national level.

**CO3:** Identify the different hierarchy of growth poles and growth centres in regional planning.

**CO4:** Explain the need of special planning for special regions through different case studies

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Regional Planning and Developments</b> Concept of regional planning: nature, objectives, levels and aims; Concept of a region, types, and regionalization, Regional Networks; Regional development; Balanced and unbalanced development; Under-development; Regional multiplier, input-output model; Core-periphery model; Growth poles and centers	L1, L2	6
<b>MODULE 2: Planning Processes</b>	L1, L2	6

Regional planning processes: Identification of plan objectives; collection, classification and analysis of data; Norms and standards for regional planning; Formulation of alternative plan proposals with respect to population distribution, location of new regional economic activities, infrastructure, plan implementation, etc. Case studies.		
<b>MODULE 3: Introduction to Rural Development</b> Meaning, nature and scope of development; Nature of rural society in India; Hierarchy of Rural settlements; Social, economic and ecological constraints for rural development, Three tier system of rural local Government; Need and scope for people's participation and <i>Panchayati Raj</i> , 73rd Constitution Amendment Act, including - XI schedule, devolution of powers, functions and finance; <i>Panchayati Raj</i> institutions - organizational linkages; Institutionalization; resource mapping, resource mobilization including social mobilization; Information Technology and rural planning	L1, L2, L3	6
<b>MODULE 4: Rural Development Initiatives in Five Year Plans</b> Five Year Plans and Rural Development; Planning process at National, State, Regional and District levels; Planning, development, implementing and monitoring organizations and agencies; Urban and rural interface- integrated approach and local plans; Development initiatives and their convergence; Special component plan and sub-plan for the weaker section; Data base for local planning; Need for decentralized planning; Sustainable rural development.	L1, L2	6

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Glasson, John ,(1974). *An Introduction to Regional Planning*
- Misra R.P. (2002). *Regional Planning – Concepts, Techniques, Policies and Case Studies*, New Delhi
- Rengasamy, S, *Regional Planning and Development*, Madurai

### References

- Mahesh Chand and Vijay Kumar Puri, (2010). *Regional Planning in India*
- Qaiyum, Abdul, (2010). *Regional Planning and Development*, ITPI, New Delhi
- Rural Development: Principles and Practice a book by Malcolm J. Moseley, 2003.
- Rural Development Issues a book by Arnold V. Burlingham, 2008.
- Rural development in India a book by Shriram Maheshwari, 1985.
- Handbook of Rural Development by Gary Paul Green, 2013.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	1	--	--	--	--	--	--	--	1	1	1	--
CO2	1	1	--	--	1	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	--	1	--	--	--	--	--	--	--	1	1	--	--
CO4	1	1	--	--	1	--	--	--	--	--	--	--	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>SPECIAL AREA PLANNING (PROFESSIONAL ELECTIVE- III) (PLN2610)</b>	L	T	S	P	C
Version 1.1		0	0	3	0	3
Pre-requisites/Exposure	Introduction to Regional Planning					
Co-requisites	Metropolitan Planning, Development and Management					

### Catalog Description

The aim of this course is to introduce the students to various Special Areas with their specific planning needs and priorities and the implication on development in these areas. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course will be on study in the need and process required for special area planning. This course will provide the students hands-on experience Special area that required a different planning process in a built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for interdisciplinary learning. The course would be conducted through literature survey, case studies, site visits, and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### Course Objectives

The objectives of this course are

- To understand the need of special area planning in Indian context.
- To familiarize students with planning process required for special area.
- To develop interdisciplinary understanding and sensitivities of future planners.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Understand the need and legislation required for special area planning

**CO2:** Prepare the detail report and presentation on a given project related to Special area planning.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Introduction to SAP and its Management</b> Special Areas under consideration would include Formal and Functional Regions (Hill Areas, Coastal Areas, Desert Areas, Special Economic Zones, Port City, Aerotropolis, Medi-City, Knowledge City etc.), Types of special	L1, L2	24

areas and their defining characteristics, Legislations and norms for Special Area Development in the Indian context, Capital investment and funding methods, public private partnerships in development process, Governance and Management aspects, Case Studies of various typologies of Special Area Development Plans in Indian and international context.		
<b>MODULE 2: Project Work</b> Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.	L4, L5, L6	16

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation*

### **Text Books**

- Development of Hill Areas, Dobha G.L, Concept Publishing
- Environmental Problems of Coastal Areas in India, Sharma Vinod, Bookwell
- Integrated Development of Hill Districts in India: Issues and Approaches, Gupta, R.C., SPACE
- Special Economic Zones In India, P. K. Manoj, Serials Publications

### **Reference Books**

- Aerotropolis: The Way Well Live Next, John Kasarda, Allen Lane
- Environmental act in India, Ruma Chatterjee, Oxford University Press
- CRZ Regulations, 2011, MoEF

### **Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

#### **Examination Scheme:**

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### **CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>BIG DATA AND DATA ANALYSIS (PROFESSIONAL ELECTIVE) (PLN)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure	PMIS					
Co-requisites	PDL VI					

### Catalog Description

This course provides a basic introduction to big data and linking it with urban and regional planning, development, management, and policy making. The objective of the course is to familiarize students with big data analysis as a tool for making maps. The course also provides a basic introduction about the process of data acquisition and analytics associated with urban areas. Through this course students will explore big data in the context of smart cities and regions with the help of real-world examples. This incorporates practical exercises to familiarize students with the format of big data. It also provides a first hands-on experience to the students in handling and analysing large, complex data structures.

### Course Objectives

The objectives of this course are

1. As technologies are getting embedded in the built environments, in this context, the major objective of this course is to understand the role and application of big data in urban and regional planning
2. To provides hands-on experience in handling and analyzing large data sets.

### Course Outcomes

On completion of this course, the students will be able to

CO1: Understand the utility of big data in Planning and identify tools for making maps.

CO2: Understand the software for handling large data sets and explore big data in the context of Smart cities.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Big data, data acquisitions, analytics and Mapping the City</b> Defining big data and what makes it 'big'; Emergence of data science and big data; its importance and utility in planning; Characteristics of	L1, L2, L3	12

<p>big data; Links between big data, urban and regional planning, development, management and policy making. Different tools for making maps with big data; Map online programs and open spatial data and its uses; Geographic information systems software for mapping; and Identification of winners and losers in the big data system.</p> <p>Understanding open data platforms; Generators of big data; Handling large datasets, cloud database system; Cleaning data, SQL, introduction to R or other software for urban data analysis. Explore big data in the context of smart cities; Learning use of real-time data collection and use; Interactive data visualization in the context of smart cities and regions.</p>		
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	<p>L4, L5, L6</p>	<p>24</p>

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation*

### **Text Books**

1. Jain, V.K. (2018) Big Data and Hadoop, Khanna Book Publishing Co., New Delhi.
2. Carta, S. (2019) Big Data, Code and the Discrete City, Shaping Public Realms, Routledge, London.
3. Desouza, K. and Smith, K. (2016) Big Data and Planning, PAS Report 585, American Planning Association, Washington, D.C. 57.
4. Townsend, A.M. (2013) Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia, W.W. Norton and Company, London.
5. Offenhuber, D. and Ratti, C. (eds.) (2014) Decoding the City: Urbanism in the Age of Big Data, Birkhauser Verlag AG.

### **References**

1. Manovich, Lev. (2012). Trending: The Promises and the Challenges of Big Social Data. Debates in the Digital Humanities, edited by Matthew K. Gold. The University of Minnesota Press.
2. Cate, Fred H. (2014). The Big Data Debate. Science 346(6211): 818-818.
3. Dutcher, Jenna. (2014). What is Big Data? UC Berkeley Data Science Blog.
4. Karsten Donnay. (2017). Big Data for Monitoring Political Instability. International Development Policy 8.1 (Online).

**Mode of Evaluation: Presentation/Assignment/Class Test /Written Examination****Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>URBAN DESIGN, RENEWAL AND CONSERVATION (PROFESSIONAL ELECTIVE) (PLN2612)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	3	0	0	0	3
Pre-requisites/Exposure						
Co-requisites	Planning and Design Lab VI					

### Catalog Description

The aim of this course is to introduce the students to learn the urban design. It is the design of towns and cities, streets and spaces, collaborative and multi-disciplinary process of shaping the physical setting for life in cities, towns and villages, the art of making places, design in an urban context. This course is to learn the quality of urban design - creates safe, attractive and secure pathways and links between centres, landmarks and neighbourhoods, facilitates green networks that link public and private open space, places a high priority on walking, cycling and public transport. During the course the students will be able work on live projects in groups which are preferably interdisciplinary of architect, planner engineer etc.

### Course Objectives

The objectives of this course are

1. To assess the urban renewal/redevelopment approaches at old city and historical sites in the context of having better access to services and sustainable urban development.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### Course Outcomes

On completion of this course, the students will be able to

CO1: Applicate the concept, challenges and solutions for Urban Design, Renewal and Conservation.

CO2: Prepare the detail report and presentation on a given project related to urban design, Renewal and Conservation.

Modules	Blooms level*	Number of hours
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<p><b>MODULE 1: Introduction to Urban Design, Renewal and Conservation</b></p> <p>Urban History and Development Theories, Urban Design Methodologies, Digital Skills for Urban Design and Landscape, Research Methodology, Site Planning, Case Studies of Urban Design and Landscape in Indian and international context. Urban Renewal, and Conservation, Development Approaches of Old City, A brief history of the landscape concept, Principle for Conservation and Renewal of decay areas within City Area, Principles and methods for the assessment of the cultural landscape, Landscape resources, management and planning structure, Mechanism for Development of Historical Area includes the Environment, Social, Culture and Economic aspect; Infrastructure and Services Facilities System of Old Area within City. Governance System and Planning aspect to build new Plan. Case Studies.</p>	<p>L1, L2, L3</p>	<p>12</p>
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	<p>L4, L5, L6</p>	<p>24</p>

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation*

### **Text Books**

1. Spiro Kostof, The City Assembled, Thames and Hudson.
2. Spiro Kostof, The City Shaped, Thames and Hudson.
3. Jon Lang, Urban Design Typology and procedures, Architectural Press
4. Lawrence W.C. Lai., Frank T. Lorne. Sustainable Urban Renewal and Built Heritage
5. Conservation in a Global Real Estate Revolution, Sustainability., 11 (580), 2019

### **References**

1. A.E.J. Morris, History of Urban Form, Longman Scientific and Technical.
2. Kevin Lynch, Good City Form, MIT Press. Edmund Bacon, Design of Cities.
3. Geoffrey Broadbent, Emerging Concepts of urban Design

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

<b>Components</b>	<b>CT-1</b>	<b>CT-2</b>	<b>HA</b>	<b>S/P</b>	<b>CE</b>	<b>A</b>	<b>ESE</b>
<b>Weightage (%)</b>	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### **CO, PO and PSO mapping**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>
<b>CO1</b>	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
<b>CO2</b>	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related



## Syllabus - Seventh Semester

	<b>LAND ECONOMICS AND LOCATION THEORY (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Real Estate Planning and Management					
Co-requisites	Urban Finance					

### Catalog Description

Land and the institution of private property are foundational to the efficient working of the capitalist system. In this line of thinking, the primary objective of this subject is to teach students about land and property development and the functioning of their markets. On theoretical side, students will be taught the basics of land economics including location theories as they pertain to land uses and property.

### Course Objectives

The objectives of this course are

- To understand the Significance of land economics
- To ascertain the process of land development
- To acknowledge the Factors Influencing Locational Decisions and Economic Analysis

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain about the nature of land and property development

**CO2:** Understand about real estate markets as well as land economics

**CO3:** Discuss the relevance and use of this knowledge for the preparation of development plans and projects.

**CO4:** Explain the location theories and will be able to apply in Plan preparation.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to Land Economics</b> Economics concepts of land, objectives and scope of land economics; relevance for spatial planning; economic principles of land use; economic rent, land use and land values, market mechanism and land use pattern.	L1, L2	9
<b>MODULE 2: Development of Land and Real Property</b>	L1, L2	8

Process of land development; Cost of development; Source of finance, financial calculation for private developers; Real property and its salient characteristics.		
<b>MODULE 3: Real Property Markets</b> Heterogeneity and imperfections, valuation of real property – principles and practices; private ownership and social control of land; disposal of land; land development charges and betterment levy; land use restrictions, compensation and requisition taxation of capital gain on land versus public ownerships, economic aspects of land policies at various levels of decision making.	L1, L2	10
<b>MODULE 4: Factors Influencing Locational Decisions and Economic Analysis</b> Analysis of location of specific uses like residential, industrial, commercial and institutional in the light of location theories in intra-regional and inter-regional context; Techniques of cost benefit analysis of urban development programme, social costs and benefits, monetization	L1, L2	9

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Church, R.L. and Murray, A.T. (2009) *Business Site Selection, Location Analysis, and GIS*, Wiley, Hoboken, New Jersey.
- Evan, A. (2004) *Economics and Land Use Planning*, Wiley-Blackwell, Hoboken, New Jersey.
- Glatte, T. (2015) Location Strategies: Methods and their methodological limitations *Journal for Engineering, Design and Technology*, Vol. 13, Issue 3, pp. 435 – 462.
- Harvey, J. (1996) *Urban Land Economics*, Fourth Edition, Macmillan, London.
- Isard, W.(1956) *Location and Space–Economy: A General Theory Relating to Industrial Location, Market Areas, Land Use, Trade, and Urban Structure*, MIT Press, Cambridge.

### References

- Nachem, I. (2007) *The Complete Guide to Financing Real Estate Developments*, McGraw-Hill, New York.
- Ryan-Collins, J., Lloyd, T., and Macfarlane, L. (2017) *Rethinking the Economics of Land and Housing*, Zed Books, London.
- Wu, J. and Duke, J.M. (2014) *The Oxford Handbook of Land Economics*, Oxford University Press, New York.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	

<b>Weightage (%)</b>	10	10	10	10	05	05	50
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CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	1	1	--	--	--	--	--	--	--	--	--		1	1	--	--
CO2	1	1	--	--	--	--	--	--	--	--	--		1	1	--	--
CO3	1	1	--	--	--	--	--	--	--	--	--		1	1	--	--
CO4	1	1	--	--	--	--	--	--	--	--	--		1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>URBAN FINANCE (PLN2703)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Urban Governance					
Co-requisites	Metropolitan Planning, Development and Management					

### Catalog Description

This course is to study and analysis the urban governance and it importance to deliver the services in India. To study the decentralization of local government is also includes in this course. The governance and government relationship is to study and analysis. In the course, governance and urban management challenges in a urbanization process is to study along with governance in post 74<sup>th</sup> Amendment Act scenario in India.

### Course Objectives

The objectives of this course are

- Analyze Multiple Sources of Urban Finance for Urban Development
- Introduce Urban Reforms and their Implications on Liquidity and Application of Urban Finance

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Describe the urban governance and it's important for development and services delivery.

**CO2:** Describe the additional funding resources and challenges in urban reforms.

**CO3:** Explain the importance for urban management through good governance

**CO4:** Discuss the 74<sup>th</sup> CAA and it's important to governance in India

Modules	Blooms level*	Number of hours
<b>MODULE 1: Multiple Finance</b> Nature and composition of income and expenditure, limitations and need for revenue enhancements; Expenditure control methods and mechanisms; Budgetary allocation from Central and State Governments for urban development; Assistance from foreign donors and Multi National agencies; Non-traditional sources of funding; Market access; Pool finance and prerequisite conditions for accessing non-traditional funds.	L1, L2	10
<b>MODULE 2: Additional Funding sources and Urban Reforms</b> Types of partnership approaches; Privatization of civic services; public privatepartnership mechanisms; Types of contracts and ownerships; Emerging cost effecttechnology interventions; User charged projects; Pricing of services. Role of state government and urban local bodies; City's challenge	L1, L2,	10

fund; Urban reforms; Implications on resources, incentive fund and state level pooled finance development fund.		
<b>MODULE 3: Institutional Capacity Enhancement</b> Better finance management, management process; Accounting and budgeting, asset management, receivables management, cost centre approach; Computerization as tool for resource enhancement; Role of Management Information Systems.	L1, L2	8
<b>MODULE 4: Plan forms and Indices</b> Financial operating plan, city corporate plan; Development of urban indicators; Infrastructure pricing and financing – financing mechanisms in addition to tax and grants; private public partnerships like BOT, BOOT, BOLT etc.; Impact fee, subsidies.	L1, L2	8

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books / References

- Bahl, Ray, W. and J. Link, (1992). *Urban Public Finance in Developing Countries*: Oxford University Press, New York
- Kulwant Singh and Behnam Tai, (2000). *Financing and Pricing of Urban Infrastructure: New Age International*, New Delhi
- KK Pandey, (2010). *Stimulating Revenue Base of Urban Local*, IIPA, New Delhi
- George E. Peterson and Patricia C. Annez, (2007). *Financing Cities*: Sage Publishers, World Bank
- Peterson, G., (2007). *Unlocking Land Values*: Cambridge University Press

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO4	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING AND DESIGN LAB - VII (REGIONAL PLANNING) (PLN2706)</b>	L	T	S	P	C
Version 1.1		0	0	10	0	10
Pre-requisites/Exposure	Fundamentals of Urban and Regional Planning, Introduction to Regional Planning					
Co-requisites	Planning Thesis					

### Catalog Description

This course gives exposure to the students about the preparation of regional plans. They will be aware of the process for preparing checklist for data collection as well as conducting field visits and various methods to collect primary as well as secondary data collection. Students need to do data synthesis, analysis, finding of potentials & issues and drawing conclusions. They need to suggest strategies and proposals as per the findings. At the end they also need to submit a detailed report on District Development plan.

### Course Objectives

The objectives of this course are

- To understand Role and Relevance of Regional Planning in general and the Context of 73rd and 74th CAA in particular.
- To study District / Metropolitan Area / Regional Development Policies and Land Utilization Plan along with Phasing, Monitoring Mechanism, and Governance Structure for Implementation

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Describe the various types of regional plans and their linkages with higher and lower order plans and constitutional provisions.

**CO2:** Utilise the primary and secondary data obtained through field visit, for the sectoral and spatial planning; detailed data analysis.

**CO3:** Evaluate the present their data analysis and drawn inferences

**CO4:** Prepare proposals as per the identified thrust areas and potential of the study area along with a detailed report of District development plan.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Context of Regional Plans and Constitutional Provisions</b> Role and relevance of regional planning at district or block level for regional planning, critical appraisal of district or block level plans; Understanding the contents of various types of regional plans and their linkages with higher and lower order plans; District planning in the context of 73rd and 74th	L1, L2	15

Constitution Amendment Acts; District Planning Committees (DPCs); Metropolitan Planning Committees (MPCs) and Ward Committees		
<b>MODULE 2: Organization of Field Surveys</b> Formulation of goals, objectives, methodologies; identification of data and sources of information; Collection of secondary and primary data for sectoral and spatial planning; detailed data analysis.	L2, L3, L4	15
<b>MODULE 3: Analysis and Synthesis</b> Identification of development issues, potential thrust areas and constraints: sectoral and spatial; designing of alternative planning strategies, settlement patterns and development strategies; Sectoral and spatial prioritization, phasing, financial plans, institutional mechanisms, legislative framework, management plans.	L4, L5	40
<b>MODULE 4: Plan, Policies and Proposals</b> Preparation of Regional Plan Document along with drawings, etc; Preparation of policies and proposals with different scenarios and identification of priority areas; phasing and monitoring; governance structures for implementation; regional land utilization plan and the plan document	L5, L6	26

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books

- Planning Commission. (2006) Manual of Integrated District Planning. Planning Commission, New Delhi
- SPA, B. (2018) Coimbatore Regional Development Plan-2038. School of Architecture and Planning, Bhopal,

### References

- Gupta, K.K. and Tyagi, V.C. (1992) Working with Maps. 105, printing group, Survey of India, DST, Govt. of India
- Cooper, H. (1998) Synthesizing Research: A Guide for Literature Review.

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	R-I	R-II	R-III	Report	CE	A	
Weightage (%)	50	50	50	40	05	05	200

R: Review, CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
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<b>CO1</b>	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
<b>CO2</b>	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
<b>CO3</b>	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
<b>CO4</b>	1	1	1	1	1	1	1	1	1	--	--	1	1	<b>1</b>	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>PROFESSIONAL TRAINING– II (PLN2707)</b>	L	T	P	C
Version 1.1		0	0	0	2
Pre-requisites/Exposure	Urban Governance, Urban Finance, Urban Management – I				
Co-requisites	Planning and Design Lab – VII (Regional Planning)				

### **Catalog Description**

Each student shall undertake Mandatory Training in a planning (or related) office during summer vacation between the Sixth and Seventh semester. The period of Training will be eight weeks. The exact period and place of training will be decided in consultation with the Co-ordinator-in-charge of training. The objective of Training is to expose the students to live planning projects and working environment at planning offices. The students are required to submit a ‘Satisfactory’ certificate from the relevant Planning Office after completion of training. The student will also submit a Report highlighting the Profile of the Planning Office, its organization, key work areas, etc; Introduction to the project(s) worked upon during training; planning brief; methods employed; and planning -design solutions / proposals. The students will also be required to present their work through drawings / visuals, power point presentations in the form of a Seminar to the faculty and students of the Department over the seventh semester, as per directions of the Co-ordinator-in-charge of training.

### **Course Objectives**

The objectives of this course are

- To understand the profile of the Planning Office / Planning Authority / Local Body / Planning Professional.
- To participate in a Live Project of Planning Office / Planning Authority / Local Body / Planning Professional

	<b>PROJECT FORMULATION, APPRAISAL AND MANAGEMENT (PLN2711)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Real Estate Planning and Management, Planning and Management of Utilities and Services					
Co-requisites	Planning and Management of Informal Sector					

### Catalogue Description

The aim of this course is to provide exposure to the students to basic concepts of project planning, appraisal and management. This course will enable the students a thorough understanding of all the theories and definitions of terms relating to project planning and management and their usage in urban and regional planning. The students will know about the impact of project appraisal, formulation and management and its significance in planning.

### Course Objectives

The objectives of this course are

- To study the project formulation and appraisal and management
- To study the project planning and implementation
- To study the project evaluation

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define the meaning and scope of project formulation, appraisal and management in planning.

**CO2:** Understand the process of project formulation and appraisal in planning.

**CO3:** Understand the process of project implementation and monitoring in planning.

**CO4:** Learn the process of project evaluation.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module 1: Introduction to Project Formulation, Appraisal and Management</b> The concept of projects, Importance of project formulation, Project formulation: definition, objectives; Stages of project formulation and their significance; Methodology for project identification and formulation; Feasibility studies, input analysis, financial cost-benefit analysis, social-cost benefit analysis; Project appraisal and report.	L1, L2, L3	7
<b>Module 2: Project Appraisals</b> Need for project appraisal; Project formulation: definition, objectives; Stages of project form Network analysis; CPM, PERT, resource leveling and allocation, time-cost trade off aspects; Bar charts, Milestones, Standard	L1, L2, L3	12

oriented cost control techniques; Techno-economic analysis of projects; appraisal and management; reasons for shortfall in its performance; scientific management, life cycle of project; detailed project report, and feasibility studies; techniques of financial appraisal, payback period, IRR, DCF, NPV, CBR.		
<b>Module 3: Project Implementation and Monitoring</b> Project implementation, stages of implementation, Teamwork, actors in project implementation; Project monitoring: meaning objectives and significance; Monitoring techniques: integrated reporting, Milestones, time and cost overrun and under runs, unit index techniques.	L1, L2, L3	9
<b>Module 4: Project Evaluations</b> Project evaluation: meaning, objectives, scope, stages, approach and steps, Life of a project; Techniques of project evaluation: input analysis, financial cost-benefit analysis, social-cost benefit analysis; case studies in urban and regional development projects.	L1, L2, L3	8

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books**

- Chandra, Prasanna. (2017). Projects: Planning, Analysis, Selection, Financing, Implementation, and Review. *McGraw Hill Education*.
- Kerzner, Harold. (2012). Project Management: A Systems Approach to Planning, Scheduling and Controlling. *Wiley*.

#### **Reference Book**

- IES Master Team. (2019). ESE 2020 – Basics of Project Management. *IES Master Publication*.
- Padalkar, Milind & Gopinath, Saji. (2016). Six Decades of project management research: Thematic trends and future opportunities. *International Journal of Project Management*, 34(7), 1305-1321. <https://doi.org/10.1016/j.ijproman.2016.06.006>
- Shenhar, Aaron J. & Dvir, Dov. (2007). Project Management Research – The Challenge and Opportunity. *Project Management Journal*, <https://doi.org/10.1177%2F875697280703800210>

#### **Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

#### **Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	

<b>Weightage (%)</b>	10	10	10	10	05	05	50
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CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
<b>CO1</b>	1	1	-	1	-	--	--	--	--	--	--	-	1	-	1	--
<b>CO2</b>	1	1	-	2	-	--	--	--	--	--	--	-	1	-	1	--
<b>CO3</b>	1	1	-	1	-	--	--	2	--	--	1	-	1	-	1	--
<b>CO4</b>	1	1	-	-	-	--	--	1	--	--	1	1	1	-	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>DISSERTATION (PLN2737)</b>	L	T	S	P	C
Version 1.1		2	1	0	0	3
Pre-requisites/Exposure	Technical Report Writing, Training Seminar I, II					
Co-requisites	Thesis					

### Catalog Description

The aim of the course is to study the technical aspect of report writing and role of methodology in research. This course gives an idea of writing skills. The course will introduce the students to all types of technical, scientific and legal writings. The course will enable the students to conduct systematic research and write technical reports.

### Course Objectives

The objectives of this course are

- To introduce students to basic literature, research process, techniques and colloquial arguments, so as to help them finalize a topic for their thesis in the subsequent semester.
- To understand the types of reports and style of writing technical reports
- To understand the methods used for conducting research.
- To know about presentation of research.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain differences between different writing formats for reports.

**CO2:** Explain important elements to give a comprehensive understanding of purpose of report.

**CO3:** Describe the differences between different writing styles for articles, papers and other texts.

**CO4:** Explain the basis for selecting appropriate research method and criteria for a good research design.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Thesis Programming</b>            Identification of topic of interest having relevance to planning profession, integration and application of the learnt research process to the pre-thesis work. Planning colloquium: Exposure to the colloquial arguments by the stakeholders, decision makers, urban managers, advocates, technocrats, user groups, etc. Based on the inputs from the colloquial arguments, the topics shall be finalized for thesis in the subsequent semester.</p>	L1, L2	6

<b>MODULE 2: Research Techniques</b> Data collection and analysis: Sample determination, data tabulation (coding, de-coding, etc.), quantitative and qualitative data analysis. Introduction to advanced statistical techniques such as, decision trees, factor analysis, fuzzy logic, multiple regression, multi variance, cobweb, logit and probit models, etc. Testing of hypothesis: Statistical hypothesis, simple and composite tests of significance, null hypothesis, types of errors, level of significance, critical region, chi-square distribution, goodness of fit, applications in planning.	L1, L2	6
<b>MODULE 3: Research Process</b> Problem identification, formulation of problem statement, literature review, working hypothesis, research brief, research methodology, sample determination, data collection and analysis, report structuring.	L1, L2, L6	6
<b>MODULE 4: Research Methodology</b> Intuition and research; Scientific research, need for scientific approach to research; Research methods; Hypotheses, testing of hypotheses; Reporting of research; Research in planning.	L1, L4, L5	6

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

#### **Text Books/**

- Kothari. C.R. (2009), Research Methodology, New Age International Publisher.
- Kumar R. (2005). Research Methodology, Sage Publication Ltd., New Delhi.

#### **Reference Books**

- Allwood, J., Anderson, L.G. and Dahl, O. (1992). Logic of Linguistics, Cambridge University, Press, Cambridge.
- Riordan, D. and Pauley, S.E. (2013). Technical Report Writing Today, 10th edition, Cengage Learning, Boston.

**Modes of Evaluation:** Group Discussions, Report Submission and Presentation, Literature Review, Referencing, Understanding of Components, Writing Style

#### **Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
<b>Weightage (%)</b>	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO2	1	2	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO3	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO4	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SMART CITIES AND ADVANCED TECHNOLOGIES FOR EMERGING PLANNING ISSUES (PLN2714) (ELECTIVE)</b>	L	T	S	P	C
Version 1.1		0	0	3	0	3
Pre-requisites/Exposure	Development, Management and Finance, Infrastructure Planning					
Co-requisites	Public Policy in Planning, Urban Governance					

### **Catalog Description**

The aim of this course is to introduce the students to smart cities concepts and solutions with their specific planning needs and priorities and the implication on development in these areas. Besides, this course also offers opportunities in specialized or advance learning in emerging spatial planning issues and planners need to give special attention to them while preparing the plans. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The course will provide the students hands-on experience of infrastructural, environmental problems emerging in a city. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for interdisciplinary learning. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

- To grasp Smart city concept as well as understanding emerging challenges in a city/region and finding out ways to resolve them.
- To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Apply smart city planning as well as critically analyze immemerging multifaceted planning issues and technology-based solution to address them.

**CO2:** Prepare the detail report and presentation on a given project with an emphasis on smart solutions in order to achieve the goal of sustainable development.



Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Smart Cities, Advance Technologies and Emerging Planning Issues</b></p> <p>Introduction to smart cities, the city as a system of systems, smart citizens, Infrastructure, technology and data, Innovation and enterprise, smart leadership and strategy, standards and capacity building, smart measurement, and learning. Case Studies of various smart cities in Indian and international context.</p> <p>Challenges and problems faced by Mega city and its region, Issues-rapid unplanned growth, urban sprawl, infrastructure related issues such as shortage of Water Supply, Public transport, Parking Issue, Shortage of housing, Solid waste management, environmental issues such as deforestation, land conversion, depletion of ground water etc. Advanced Solution- Advanced Transport Planning system, Smart Mobility, Application technology for improving agriculture productivity, Rain water harvesting, green roofs Sustainable housing affordability, Zero-carbon city, Use of Information and Communication Technology in Planning and Governance- E- Governance, E-Planning, Case studies covering various planning issues at different level of Planning</p>	L1, L2	12
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- Dash, R. Environmental Sustainability Index for Indian States 2009 Informing Environmental Action. Chenna: Centre for Development Finance, Institute for Financial Management and Research.
- GRIHA. (2010). National Rating System, 'GRIHA' Green Rating for Integrated Habitat Assessment, An evaluation tool to help design, build, operate and maintain a resource-efficient built environment, GRIHA manual Volume 1. TERI Press, New Delhi: Ministry of New and Renewable, Energy, Government of India and The Energy and Resources Institute.
- Girardet, H. \_1990.. The metabolism of cities. In: Cadman, D.and Payne, G. \_eds. \_1990.. The Living City: Towards a Sustainable Future London: Routledge.
- Smart Cities Unbundled, Sameer Sharma, Bloomsbury India

- The Smart City Transformations: The Revolution of The 21st Century, Amitabh Satyam, Bloomsbury India

### References

- Basiago, A. D. \_1996.. The search for the sustainable city in20th century urban planning. The Environmentalist, 16
- Douglas, I. Urban ecology and urban ecosystems: understanding the links to human health and well-being.Curr. Opine. Environ. Sustain. 2012, 4, 385–392.
- Smart Technologies, K. Worden, World Scientific Publishing Co Pte Ltd
- Smart Technologies for Smart Governments, Manuel Pedro Rodríguez Bolívar, Springer Publications

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PARTICIPATORY AND INTEGRATED URBAN DEVELOPMENT (PROFESSIONAL ELECTIVE) (PLN)</b>	L	T	P	S	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Urban Finance					
Co-requisites	PDL VI					

### Catalog Description

The aim of this course is to introduce the students to the conditions of effective participation. Besides, this course also offers opportunities in specialized or advance learning in emerging challenges for public participation in urban development process and planners need to give special attention to them while preparing the plans. The course intends to sensitize the students to the importance of participatory processes and integrated institutional arrangements for more effective, efficient and sustainable implementation.

### Course Objectives

The objective of this course is

- To demonstrate an understanding of the necessity of participatory and integrated urban development.
- To show Knowledge of current mandates and practices of public participation at planning level.

### Course Outcomes

On completion of this course, the students will be able to

CO1: Establish an understanding on the role of public participation in plan making, implementation and governance in India.

CO2: To apply participatory and integrated urban development processes in planning practice through case studies.

Modules	Blooms level*	Number of hours
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<p><b>MODULE 1: Understanding Public participation for integrated urban development in India</b></p> <p>Understanding participation, conditions for effective participation; idea of power and representation in participatory process, Arenas of participation; Brief introduction to theories on citizen and community participation such as Arnstein’s ladder of citizen participation.</p> <p>Public Participation in India- Channels of public participation in plan making, plan implementation and governance in India; Legislative provisions; mandated and claimed spaces of participation; Requirements for planning a participatory process; evolution of community participation in development projects; Pani Panchayats.</p> <p>Coordination in planning, understanding various kinds of public agencies involved in urban development and coordination for the purpose of plans projects and management in urban areas and regions, case studies.</p>	L1, L2, L3	12
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

*\*Bloom’s Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books**

1. Cornwall, A. (ed.) (2011) The Participatory Reader, Zed Books, London.
2. Kochi Municipal Corporation and GIZ (2019) Multi-stakeholder Ente Kochi Initiative, Kochi Municipal Corporation and GIZ India, Kochi.
3. Kumar, A. and Prakash, P. (eds.) Public Participation in Planning in India, Cambridge Scholars Publishing, Newcastle.

**References**

1. Pune Smart City Development Corporation Ltd. (2016) Smart City Development Plan, Pune Smart City Development Corporation Ltd., Pune.
2. UN Habitat (2018) Leading Change: Delivering the New Urban Agenda through Urban and Territorial Planning, UN Habitat, Nairobi.

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SUSTAINABLE CITIES AND REGIONS (PROFESSIONAL ELECTIVE) (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	DISSERTATION					
Co-requisites	PDL IV					

### Catalog Description

The primary purpose of this subject is to understand that complex relationships exist between cities and the regions and natural environments on which they rely. This course focuses on how to examines such relationships and how they impact upon urban, suburban, rural and regional dweller at different scales in the 21st century. Students will learn about the major challenges currently faced by urban areas around the world – including poverty, unemployment, poor housing infrastructure, and constraints on productivity – and the extraordinary potential of these areas to enable change in the future.

### Course Objectives

The objectives of this course are

- To understand urban sustainability, measures of sustainability, and elements and intersectionality of Sustainable Development Goals.
- To focuses on effective governance in order to ensure sustainability of a city and a region.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Identify the measures of urban sustainability

**CO2:** Demonstrate knowledge and skills to plan for sustainable development of a city or a region.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Planning and Measuring Sustainability</b> Starting with Brundtland report, different perspectives on urban and regional sustainability; Economic development and sustainability; Healthy city; Dimensions and components of sustainable urban and regional development; Elements of a new and improved paradigm of sustainability; Green cities, growing cities, just cities; Urban planning and the contradictions of sustainable development; Environmental justice and the sustainable city; Understanding urban and regional sustainability indicators; Sustainability assessment with a focus on community interests, etc.; Sustainability indicators used by a city of your choice. Genesis, history, and limits of carrying capacity; Urban ecological footprints, planning with ecological footprints; Governance and local sustainability; Problematizing the politics of sustainability; New politics of sustainability fixes; Environment and the	L1, L2	12

<p>entrepreneurial city: searching for the urban ‘sustainability fix’; Third wave sustainability; Sustainability schizophrenia or actually existing sustainability: toward a broader understanding of the politics and promise of local sustainability; Alternative routes to the sustainable city with examples. Understanding New Urban Agenda, Sustainable Development Goals, Paris Agreements; India’s position of these global agreements; Industrial ecology, planning for eco-industrial parks, drivers and limitations for the successful development and functioning of eco-industrial parks; SEZs, and development of ports, airports and road and rail based corridors.</p>		
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Conducting community participation exercises in small groups with varied stakeholders, Organising consultative meetings, Focus group discussion, Preparing small scale project with the help of local community and demonstration of the same. Collection of data through primary sources; Conducting survey; Database development; Qualitative and quantitative data analysis; Report writing and presentations.</p>	<p>L1, L2, L4</p>	<p>24</p>

*\*Bloom’s Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books/**

- Adriano, B., Daniele, V., Pierre, L., and Simona, C. (eds.) (2017) *Smart and Sustainable Planning for Cities and Regions: Results of SSPCR 2017*, Springer, Switzerland.
- Barbara, N. (2019) *Sustainable Pathways for our Cities and Regions, Planning within Planetary Boundaries*, Routledge, New York.
- Chapple, K. (2015) *Planning Sustainable Cities and Regions: Towards More Equitable Development*, Routledge, New York.
- Hildebrand, F. and Paul, Y. (2007) *Visions of Sustainability: Cities and Regions*, Taylor and Francis, London.
- Mcgranahan, G., Schensul, D. and Singh, G. (2016) Inclusive Urbanization: Can the 2030 Agenda be delivered without it, *Environment and Urbanization*, Vol. 28, No. 1, pp. 13-34.
- Watson, V. (2016) Locating planning in the New Urban Agenda of the

**Modes of Evaluation: Assignment/Case Study/ Presentation/Class Test/Written Examination**

**Examination Scheme:**

Components	Internal Assessment						ESJ
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	-	-	-	40	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury  
**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	2	2	--	--	--	--	--	--	--	--	--	1	2	--	2

1: strongly related, 2: moderately related and 3: weakly related



## Syllabus - Eighth Semester

	<b>PLANNING LEGISLATION-II (PLN)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Planning Legislation- I					
Co-requisites	Planning Thesis					

### Catalog Description

The aim of this course is to provide an in-depth understanding of the laws in urban and regional planning. Also helps to understand (i) how master plan as statutory documents interprets constitutional provisions and (b) to appreciate the interface between planning law and other laws.

### Course Objectives

The objectives of this course are

- To understand the Planning and Development Law and Statutory Plans
- To understand the Roles, Responsibilities of various Plan Preparation and Implementation Authorities / Agencies.
- To understands planning law, environment law and heritage law

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Demonstrate knowledge about the role of statutory master plans in translating constitutional provisions.

**CO2:** Discuss the environment and heritage laws and other relevant acts.

**CO3:** Explain about the implications of environment and heritage laws for town planning laws

**CO4:** Assess the role of different local and regional bodies responsible for plan implementation.

Modules	Blooms level*	Number of hours
<b>Module 1: Planning and Development Law and Statutory Plans</b> Statutory nature of comprehensive plans and its implications, Plan Preparation and Modification process, Case laws related to matters related to plan preparation, change of land use, implementation and enforcement.	L1, L2	10
<b>Module 2: Planning Law and Environment laws</b> Current legislation related to environment. Interface and conflicts between town planning, environment laws; Case laws.	L1, L2	10
<b>Module 3: Planning Law and Heritage Laws</b>	L4	8

Current legislation related to heritage. Interface and conflicts between town planning, and heritage legislation; Case laws.		
<b>Module 4: Real Estate and other related laws for development</b> Real Estate (Regulation and Development) Act, 2016 and other relevant acts at a particular time, for example, Special Investment Region Act, Community Participation Law.	L1, L2	8

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- ITPI, *Planning Legislation and Professional Practice*, New Delhi
- GOI, (1996). *URDPFI Guidelines Volume 2A*, ITPI New Delhi
- Bijlani, H.U. *Law and Urban Land*, New Delhi

### References

- Bhargava G. (2002). *Development of India's Urban and Regional Planning in 21st Century: Policy Perspective*, Gyan Publishing House
- J Cameron Blackhall (2005). *Planning Law and Practice*, Taylor & Francis Ltd
- K. R. Gupta ,Prasenjit Maiti (2004). *Urban Development Debates in the New Millennium*, Atlantic Publishers; ISBN: 9788126903900

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	--	1	--	1	1	--	--	--	--	--	--	--
CO2	1	--	1	--	--	3	--	--	--	--	--	--	--	--	--	1
CO3	1	--	1	--	--	3	--	--	--	--	--	--	1	--	--	1
CO4	1	--	2	1	--	1	--	--	--	--	--	--	1	--	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING PRACTICE II (PLN2802)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Real Estate Planning and Management, Project Formulation, Appraisal and Management					
Co-requisites	Human Values in Planning, Planning Thesis					

### Catalog Description

The aim of this course is to study role and responsibilities of Professional Planner and to attain the knowledge of project formulation, valuation and conditions of engagement and scale of professional charges. This course objective to provide the foundation, knowledge and skills needed to work in planning organisation. It is designed to build understanding of the complex interactions and uncertainties of the development process.

### Course Objectives

The objectives of this course are

- Understand the roles of planner for plan and development in India cities and towns
- Identify the agencies that involves in planning process and development plan, execution and operation and maintenance
- Understand the need of Valuation, Methods of Real Property Valuation, Contract Documents and Project Formulation

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the role and responsibility of planners as decision maker.

**CO2:** Evaluate the scale of charges for different plans prepared at different levels

**CO3:** Describe the heterogeneity and imperfections of land and methods of valuation in real property

**CO4:** Describe the process involved in project formulation

Modules	Blooms level*	Number of hours
<b>Module 1: Role of Planner</b> Planner's input as professional at various levels and organizations, his role in decision making processes, relevant issues: generalists vs. specialists, professionals vs. technocrats, planner as decision maker vs. advisor to decision maker, relationship with client, developers, institutions and contractors; relationship with other experts such as engineers, architects, sociologists, economist, lawyers, etc; for specialized studies related to planning.	L1, L2	8
<b>Module 2: Organization, Scope and Scale of Charges</b> Aims and objectives of professional institutes, sister bodies; professional roles and responsibilities of planning consultants; professional ethics; responsibilities towards clients, fellow professionals and general public; Scope of services for different projects like master plan for urban area, zonal	L1, L2	8

/ district plan, sector / neighbourhood; layout, group housing schemes, commercial centers, industrial estates, etc; Consultancy agreements and safeguards; Fees and scales of professional charges, competitions and copyrights.		
<b>Module 3: Valuation and Methods of Real Property Valuation</b> Fundamentals of valuation, Purpose of valuation; Valuation for wealth & income tax, capital gains tax, property & gift tax etc, ownership of land, compound interest theory, calculating of present value, concepts of economic rents and social rents, property taxes, sinking fund, annuity, depreciation, valuation tables; Legislative framework-rent control, easements and their effects on properties; Income capitalization methods, land and building method and other methods of valuation;	L1, L2, L3	12
<b>Module 4: Contract Documents and Project Formulation</b> Tenders, contracts, arbitration, schedule of rates for construction; Materials, labor and equipment for land development, unit and mode of measurements, rate analysis; Formulations of project proposals and outline; Preparation of and response to Notice Inviting Tenders, Expression of Interest, Terms of Reference, Penalty clauses, etc.	L1, L2	8

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

- Gary Hack, E. L. (2009). *Local Planning: Contemporary Principles and Practice*. Intl City County Management Assn.
- ITPI. (1995). *Conditions of Engagement of Professional Services and Scale of Professional Fees and Charges*. ITPI.
- PMBOK Guide” by the Project Management Institute (PMI)
- K. Nagarajan (2004). *Project Management*. New Age International
- Joshua Kahr, M. C. (2005). *Real Estate Market Valuation and Analysis*. John Wiley & Sons; Har/Cdr edition.
- Wyatt, P. (2013). *Property Valuation*. Wiley-Blackwell; 2nd edition.

### **Reference Books**

- AITP Reader on Ecology & Resource Development, AITP
- AITP Reading Material on Environmental Planning and Design, Prof A. K. Maitra , SPA Delhi
- Evaluating Sustainable Development in the Built Environment, Brandon P.S., WILEYBLACKWELL Pub., UK
- Mahyar Ardeshiri and Ali Arddesiri, (2011): *Sprawl or Compact City: The Role of Planners in Urbanization Processes in Developing Countries*, Research Gate,
- TCPO, (2014): *Urban Greening Guidelines, 2014*, Town and Country Planning Organization, Ministry of Urban Development, Government of India, Delhi
- *The Economics of Low Carbon Cities: A Mini-Stern Review for the Leeds City Region*, Andy Gouldson et al., The Centre for Low Carbon Futures Partnership, University of Hull, University Of Leeds

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination**

**Examination Scheme:**

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	1	--	--	--	--	--	1	1	--	--	--
CO2	1	1	--	--	--	1	--	1	--	--	--	1	1	--	1	1
CO3	1	1	1	--	--	--1	--	--	--	--	--	--1	1	--	1	1
CO4	1	1	1	--	--	--	--	--	1	--	1	1	1	--	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>HUMAN VALUES IN PLANNING (PLN2803)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Housing and Community Planning, Planning Practice – I					
Co-requisites	Planning Practice – II					

### Catalogue Description

The aim of this course is to provide exposure to the students to basic concepts of human values in planning. This course will enable the students a thorough understanding of all the theories and practices in planning their importance in urban and regional planning. The students will know about the values that make a good human being and a good society.

### Course Objectives

The objectives of this course are

- To study the explorations of human values.
- To study the characteristics of good professional and social values.
- To study the context of life with personal and professional work.

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Define the meaning of human values in planning and understand the values in science and technology.

**CO2:** Know the various types of values.

**CO3:** Understand the concept of ethics and its role in planning and development.

**CO4:** Learn the various values and management.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module 1: Values and Science and Technology</b> The value-crisis in the contemporary Indian Society; The nature of values: the value spectrum for a good life; The Indian system of values. Material development and its values; the challenge of science and technology; Values in planning profession, research and education	L1, L2, L3	8
<b>Module 2: Types of Values</b> Psychological values — integrated personality; mental health; Societal values — the modern research for a good society; justice, democracy, rule of law, values in the Indian constitution; Aesthetic values — perception and enjoyment of beauty; Moral and ethical values; nature of moral judgment; Spiritual values; different concepts; secular spirituality; Relative and	L1, L2, L3	10

absolute values; Human values — humanism and human values; human rights; human values as freedom, creativity, love and wisdom.		
<b>Module 3: Ethics</b> Canons of ethics; ethics of virtue; ethics of duty; ethics of responsibility; Work ethics; Professional ethics; Ethics in planning profession, research and education.	L1, L2, L3	9
<b>Module 4: Values and Managements</b> Management by values — professional excellence; inter-personal relationships at work place; leadership and team building; conflict resolution and stress management, management of power	L1, L2, L3	9

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Wachs, Martin. (2017). Ethics in Planning. *Routledge*.
- Schwartz, Barry & Sharpe, Kenneth. (2011). Practical Wisdom: The right way to do the right thing. *Penguin USA*.

### Reference Book

- Beatley, Timothy. (1989). Environmental Ethics and Planning Theory. *Journal of Planning Literature*. <https://doi.org/10.1177%2F088541228900400101>
- Howe, Elizabeth. (1990). Normative Ethics and Planning Theory. *Journal of Planning Literature*. <https://doi.org/10.1177%2F088541229000500201>
- Thrupp, Lori Ann, Cabarle, Bruce & Zazueta, Aaron. (1994). Participatory methods in planning and political processes: Linking the grassroots & policies for sustainable development. *Agriculture and Human Values*, 11(2-3), 77-84. <https://doi.org/10.1007/BF01530448>

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	1	--	1	--	--	--	1	1	--	1	1
CO2	1	1	1	--	--	--	--	--	--	--	--	--	1	--	1	1
CO3	1	1	--	--	--	1	--	--	--	--	--	1	1	--	--	--
CO4	1	1	1	--	--	--	--	--	1	--	1	1	1	--	1	1

1: strongly related, 2: moderately related and 3: weakly related



	<b>RURAL DEVELOPMENT AND MANAGEMENT (PLN2804)</b>	L	T	S	P	C
Version 1.1		3	0	0	0	3
Pre-requisites/Exposure	Regional Planning					
Co-requisites	Planning Practice – II					

### Catalogue Description

The course attempts to understand the theoretical basis for various concepts Rural Development and learn the practice of rural planning in the Indian context. The course provides an in-depth understanding of the issues of rural development, regional disparity and the need for balanced regional development in the context of globalization and rapid economic transformations in the country. Rural policies and sectoral policies are also discussed. Metropolitan regions, districts as planning regions and rural planning issues are discussed in the wider spectrum of holistic rural development and management.

### Course Objectives

The objectives of this course are

- To understand the importance of rural area
- To analyze the post-independence scenario of rural areas
- To examine the initiatives of five-year plans for rural development
- To understand the post 73<sup>rd</sup> CAA scenario

### Course Outcomes

On completion of this course, the students will be able to

**CO1:** Explain the importance of rural development

**CO2:** Describe the post-independence scenario of rural areas

**CO3:** Describe initiatives of five-year plans for rural development

**CO4:** Describe the post 73<sup>rd</sup> CAA scenario

Modules	Blooms level*	Number of hours
<b>Module 1: Introduction to Rural Development and its roots in India</b> Meaning, nature and scope of development; Nature of rural society in India; Hierarchy of Rural settlements; Social, economic and ecological constraints for rural development. Rural reconstruction and <i>Sarvodaya</i> programme before independence; Impact of voluntary effort and <i>Sarvodaya</i> Movement on rural development; Constitutional direction, directive principles; <i>Panchayati Raj</i> - beginning of planning and community development; National extension services.	L1, L2, L3	8

<p><b>Module 2: Post Independence rural Development</b> Balwant Rai Mehta Committee - Three tier system of rural local Government; Need and scope for people's participation and <i>Panchayati Raj</i>; Ashok Mehta Committee - linkage between <i>Panchayati Raj</i>, participation and rural development.</p>	L1, L2, L3	10
<p><b>Module 3: Rural Development Initiatives in Five Year Plans</b> Five Year Plans and Rural Development; Planning process at National, State, Regional and District levels; Planning, development, implementing and monitoring organizations and agencies; Urban and rural interface-integrated approach and local plans; Development initiatives and their convergence; Special component plan and sub-plan for the weaker section; Data base for local planning; Need for decentralized planning; Sustainable rural development.</p>	L1, L2, L3	9
<p><b>Module 4: Post 73rd Amendment Scenario</b> 73rd Constitution Amendment Act, including - XI schedule, devolution of powers, functions and finance; <i>Panchayati Raj</i> institutions - organizational linkages; Institutionalization; resource mapping, resource mobilization including social mobilization; Information Technology and rural planning.</p>	L1, L2, L3	9

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

#### Text Books

- Rural Development: Principles and Practice a book by Malcolm J. Moseley, 2003.
- Rural Development Issues a book by Arnold V. Burlingham, 2008.
- Rural development in India a book by Shriram Maheshwari, 1985.
- Handbook of Rural Development by Gary Paul Green, 2013.

#### Reference Book

- Lector Notes on comparison between 73<sup>rd</sup> and 74<sup>th</sup> Amendment Act.
- [http://planningcommission.nic.in/reports/genrep/mlp\\_idpe.pdf](http://planningcommission.nic.in/reports/genrep/mlp_idpe.pdf)
- Effectiveness of Mahatma Gandhi National Rural Employment Guarantee Scheme (Mgnregs) with Special Reference to Panchayath, pdf.
- <http://www.iosrjournals.org/iosr-jhss/papers/Vol.%202021%20Issue9/Version-8/I2109085671.pdf>.

#### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment						ESE
	CT-1	CT-2	HA	S/P	CE	A	
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	1	--	1	--	--	--	1	1	--	1	1
CO2	1	1	1	--	--	--	--	--	--	--	--	--	1	--	1	1
CO3	1	1	--	--	--	1	--	--	--	--	--	1	1	--	--	--
CO4	1	1	1	--	--	--	--	--	1	--	1	1	1	--	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING THESIS (PLN2837)</b>	L	T	S	P	C
Version 1.1		0	0	18	0	18
Pre-requisites/Exposure	PDL VII, PDLVI, PDL V					
Co-requisites	Human Values in Planning, Planning Practice - II					

### **Catalog Description**

The aim of this course is to Equip Students to Conduct Independent Research. This course will help students of identifying his or her own area of interest; able to explore a subject in depth; manage a research project; define a suitable question and use the appropriate research tools. This course will also contribute to the standards for academic writing. Each student of Bachelor of Planning is required to prepare a thesis on the subject of his / her choice, concerning urban, regional or rural planning. The topic shall be approved by the concerned department. Thesis will provide an opportunity to the student to conduct independent research by using the skills of analysis and synthesis learnt through various theory and practical courses. Thesis will be completed under the guidance of an approved research supervisor allotted by the Department. Thesis will be prepared by the student as per Thesis Manual prepared by the Department. The students will be required to present thesis orally, graphically and through written report. The student will also be required to present her thesis before the external jury appointed by the concerned University /Institute / School.

### **Course Objectives**

The objectives of this course are

- To study and understand the scientific research method to carry out proper research to solving issues and problems in the context of urban and regional area.
- To study and learns the details research methodology such literature, cases study area, data collection, data analysis and result/finding particularly in urban / regional areas for addressing issues and problems and its challenges.
- To study and learns the formulation of policies, plan, suggestion / recommendation based on the research work.

### **Course Outcomes**

On completion of this course, the students will be able to

**CO1:** Identify the need of their dissertation and formulate the aim and objectives respectively.

**CO2:** Organize field surveys and collect data from their related fields.

**CO3:** Analyze the data collected and find the gap .

**CO4:** Propose and recommend for the gap identified.

Module	Blooms level*	Number of hours
<b>Module 1: Need for the Study and Methodology and Literature Research</b> Clear goals and objectives along with scope of each objective should be outlined before establishing the need for conducting a research study; Substantive limitations of the research work should also be stated. Previous published work on the subject area has to be critically examined for finding out existing thought processes of other authors and trends (proper acknowledgements by authors).	L2,L3	-
<b>Module 2: Field Surveys</b> Depending on the research topic, field surveys have to be designed and field work has to done after conducting appropriate sample surveys.	L4, L5, L6	-
<b>Module 3: Synthesis of Data and Information and Findings</b> Field data and information and literature research findings should be synthesized to make final arguments and identification of planning issues.	L4, L5, L6	-
<b>Module 4: Proposals and Recommendations</b> Final, specific planning proposals and recommendations should be made at various geographical levels. Proposals should directly emanate from analysis and should not be generalized. Thesis should contain a list of references as per international practice.	L4, L5, L6	-

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### Text Books / References

- C.R. Kothari, (2004): Research Methodology, New Age International (P) Limited Publications, Delhi
- Shanti Bhushan Mishra and Shashi Alok., (2017): Hand Book of Research Methodology, GateResearch
- Chinelo Lgwenagu, (2016): Fundamental of Research Method and data collection, British Council,Research Gate
- Jennifer Mason, (2002): Qualitative Researching, 2nd edition, SAGE Publications, London

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	Internal Assessment									ESJ
	R-I	R-II	R-III	R-IV	R-V	R-VI	Report	CE	A	
<b>Weightage (%)</b>	50	50	75	75	75	75	90	05	05	300

R: Review, CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination, ESJ: End Semester Jury

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	--	--	1	--	--	--	--	1	1	--	1	--
CO2	1	1	1	1	--	--	1	--	--	--	--	1	1	--	1	--
CO3	1	1	1	1	--	--	1	--	--	--	--	1	1	--	1	--
CO4	1	1	1	1	--	--	1	--	--	--	--	1	1	--	1	--

1: strongly related, 2: moderately related and 3: weakly related

# Examination Rules and Regulations

## 1. QUALIFYING STANDARDS

- 1.1 Progressive marks refer to the marks given to a student on a continuous basis during a semester by the concerned subject teacher/teachers.
- 1.1.1 In the case of subjects which are mainly studio based as per the scheme of teaching and examinations, the progressive marks shall be the total of marks given to the various jury/reviews from time to time in sheets and report format.
- 1.1.2 In the case of subjects which are mainly lecture based as per the scheme of teaching and examinations, the progressive marks shall be based on the average of two tests conducted normally at the end of 8th and 12th weeks of each semester. Provided that, the teacher may give assignments instead of tests which may include topic/case presentation, book reviews, write-ups etc.
- 1.1.3 In the case of subjects which are mainly practical based as per the scheme of teaching and examinations, the progressive marks shall be based on the assignments submitted by the students. A minimum of two assignments per semester shall be given.
- 1.1.4 In all the above mentioned three cases, viz studio based, lecture based and practical based subjects:
- The concerned teacher shall give a reasonable opportunity to the student to improve his/ her progressive marks, for example by re-doing the assignments or taking an additional test etc, within the time frame of the given semester with approval of HOD/HOI.
  - The relevant records and submissions of students which have been assessed for progressive marks shall be produced as and when they are sought by the university within 12 months, after 12 months that no records shall be retained/produced.
- 1.2 If a candidate fails to secure a **minimum of 50% of marks** in progressive marks in any subject, he /she shall not be eligible to take up theory/viva voce/end term examination in that subject.
- 1.3 It shall be the responsibility of concerned Head of the Department to implement clause “1.2” in the event of an ineligible candidate inadvertently being allowed to appear for the theory/ viva voce /end term examination, the result of the concerned examination shall be considered as null and void.
- 1.4 Such candidates shall correct, improve, redo the concerned works on the advice of subject teacher and re- submit them during subsequent semester of the next year in order to secure the minimum required progressive marks in that subject.
- 1.5 Once a candidate secures ‘minimum’ or ‘more than the minimum’ progressive marks in any subject, the marks shall be made permanent and shall not be changed under any circumstances.
- 1.6 To pass a subject, a candidate shall secure a minimum of 50% marks in Progressive marks and 50% marks in the end term examination (Theory examination/ Practical examination/ viva voce examination/ Total marks) ie Internal Marks: External Marks: Total marks :: 50:50:50.
- 1.7 Candidates who do not fulfil above cited clause no. 1.6 shall be deemed to have failed in that subject and have to re-appear for the Theory examination / practical examination or

viva voce examination in which he/she has secured less than the minimum prescribed marks.

1.8 A minimum of 4.00 SGPA shall be secured by the student to be eligible for the award of degree.

## **2. THESIS EXAMINATION**

2.1 The 'Thesis' of every student in the final semester shall be evaluated on thesis presentation by the student through viva-voce examination by the panel of the jury in accordance with the Regulations issued separately.

2.2 The jury shall include two external jury members and one internal member (Thesis Coordinator) from the faculty, in addition to the Chairman/HOD/HOI. Out of the four jury members, at least two must be present to complete the proceedings of the jury.

2.3 A student who fails in the thesis evaluation shall be allowed to resubmit the modified thesis after a minimum period of two months with due approval by the management, Amity University Haryana.

## **3. SUMMER TRAINING**

3.1 Each student shall undertake mandatory training in a planning (or related) office during summer vacation after fourth and sixth semester. The period of training will be **minimum six weeks and maximum eight weeks**. The exact period and place of training will be decided in consultation with the Co-ordinator-in-charge of training. The students are required to submit a 'Satisfactory' certificate from the relevant Planning Office after completion of training. The student will also submit a report highlighting the profile of the Planning Office, its organization, key work areas, etc; be required to proceed on 'Summer training'. A Final Viva shall be conducted after each successful summer training.

3.2 The marks for Summer training shall be awarded to each student in accordance with the Regulations and guidelines issued by the Training Coordinator in consultation with HOI ASAP, Amity University Haryana.

## **4. PROMOTION RULES**

4.1 A Student not satisfying the requirement of qualifying standards, at any semester, as per the Clause 1.6, shall be detained from appearing at the semester examination for that particular subject.

4.2 Such a student shall have to repeat the particular subject, as a ex-student student with the next batch of students.

4.3 A student satisfying all the standards as provided in Clause 1 shall be declared to have 'Passed' the semester examination.

4.4 A student not satisfying all the criteria of qualifying standards of Clause 1 in conjunction with the provisions of Clause 4.2, but failing in any number of subjects of both the semesters of a class taken together shall be declared to have been 'Promoted With Back-Papers' (PBP) and, shall be governed by Clause 5. A student so declared as PBP shall have to clear the back papers, as and when the examination of the concerned semester is held next.

4.5 A student not satisfying all the criteria of qualifying standards of Clause 1.1 in conjunction with the provisions of Clause 4.2, and has invoked the provisions of Clause no. 6, shall be declared as 'Promoted with Grace marks' (PWG), and shall be promoted to the next higher class.



- 4.6 The students who are not covered by provisions of Clause 4.1 to 4.5 shall be declared to have 'Failed'. Such students shall be required to repeat both the semesters of the said class, either as a 'regular student' or as an 'ex-student', in accordance with the Clause 5 and 6.

#### **5. PROMOTION UNDER CARRY- OVER SYSTEM**

- 5.1 A candidate covered under Clause 4.4 shall become eligible for provisional promotion to the next higher class of the course and shall get another chance to clear the said 'Back-Papers' in the next examination of the concerned semester under the carry-over system.
- 5.2 On failing again in any of the 'Back-papers' examination of a semester, the provisional admission granted to the concerned student in the higher class shall automatically stand cancelled and he/she shall have to clear the 'Back-papers' as an 'ex-student' or as a 'regular student', in accordance with the Clause 6.
- 5.3 Marks obtained by a student to clear his/her back paper shall replace the original marks, secured earlier by the student only to the extent of the minimum qualifying marks for computation of his/her result.

#### **6. EX-STUDENTSHIP**

- 6.1 A student opting to clear his/her examinations as an ex-student shall be required to inform the college, in writing, within 15 days of start of the next academic session.
- 6.2 An ex-student shall be required to appear at the 'Theory' and 'Practical /viva-voce' examination of all the subjects of both the semesters of the concerned class. However, the marks, for the 'Mid Term Examination' of all the subjects in the earlier regular attempt shall be retained as obtained by him/her.
- 6.3 If a student opts to repeat the semester as a regular student, the new marks awarded to him for 'Mid Term Examination' shall replace the old marks obtained by him in the earlier attempt.

#### **7. GRACE MARKS**

- 7.1 Grace Marks shall be allotted to the students within the policy directives of the Amity University Haryana.

#### **8. MIGRATION**

- 8.1 Migration of students from one Institute to other shall not be allowed unless it falls within the policy directives of the Amity University Haryana.

#### **9. COURSE DURATION**

- 9.1 Minimum duration of the course will be 4 years.
- 9.2 If any students fail to clear all the subjects as per clause 9.1, student have to clear remaining subjects in N+2 years where N will be the minimum course duration as per Amity University Gurgaon guidelines.

## Master of Planning (Urban & Regional)

**FLEXILEARN**

-Freedom to design your degree



### Programme Structure

### Curriculum & Scheme of Examination

2020

**AMITY UNIVERSITY HARYANA**

**GURUGRAM**

## **PREAMBLE**

Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic programme with necessary skills to enable them to excel in their careers.

Master of Planning (Urban and Regional) abbreviated as M. Plan (URP), is a master's degree course in planning offered by Amity School of Architecture and Planning, Gurugram. It offers specialisation in Urban & Regional Planning. This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure is a combination of various subjects, which includes studios, labs, theory and field visits. It includes the both Core and Elective courses (Planning) as well as Open Electives which are integral part of every course offered by Amity University to prepare its students globally competent. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P) and Studio hours (S). Towards earning credits in terms of contact hours, 2 Lecture and 1 Tutorial per week are rated as 2 credit for all theory subjects in planning, 1 Lecture and 2 practical hours elective subjects in planning and 10 hours per week are rated as 10 credit for the planning studios. Besides, planning thesis is rated as 18 credits.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are defined in course structure table and a note after all the Tables.

M. Plan (URP) is a two year professional degree course consisting of four semesters. The course structure and syllabus is designed in coherence with the Model Curriculum for M. Plan./M. Tech (Planning), All India Council for Technical Education, Model Curriculum Institute of Town Planners, India, M. Plan (URP) Course Curriculum School of Architecture and Planning (SPA) Bhopal, M. Plan (URP) Course Curriculum SPA Vijayawada. It is hoped that it will help the students to study in a planned and a structured manner and promote effective learning. Wishing students an intellectually stimulating stay at Amity University, Gurugram.

## Master of Planning (Urban and Regional)

### **Programme Mission:**

The mission of the Planning programme is to foster an environment of academic excellence in Urban and Regional Planning at bachelors and masters level through research and innovation, industry integration, internationalization and extension activities and develop highly trained and employable professionals with specialization in the area of Urban and Regional Planning, who are socially responsible and nationally/globally competent professional to meet the contemporary and emerging needs of society and the nation.

### **Programme Description:**

The two-year full-time Masters programme in planning with specialization in Urban and Regional Planning, is to educate and prepare students with the knowledge, analytical ability, and management perspectives and skills needed to address and solve urban and regional issues, to motivate and to manage diversified workforce, multiple stakeholders, emerging trends, rapid technological change and competitive marketplace while considering the principles of ethical, legal and governance fundamentals.

### **Programme Outcome (PO):**

- PO1      Planning knowledge:** Apply the fundamentals knowledge of physical, socio-economic, environmental, legal and institutional framework and an urban-regional planning specialization to the solution of complex problems at city and regional level.
- PO2      Problem analysis:** Identify, formulate, research literature, as well as analyze complex urban and regional planning problems and reaching substantiated/concrete conclusions.
- PO3      Design/development of solutions:** Planning/Design solutions for various urban and regional planning problems that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4      Conduct investigations of complex problems:** Use research-based knowledge and research methods including data analysis and interpretation as well as synthesis of the information to provide valid conclusions.
- PO5      Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern planning, statistical, thematic mapping and design tools (SPSS, GIS, Infographics software), including prediction and modeling to complex planning activities.
- PO6      The Planner and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional planning practice.
- PO7      Environment and sustainability:** Understand the impact of the professional planning solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

- PO8**     **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the planning practice.
- PO9**     **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10**    **Communication:** Communicate effectively on complex planning activities with the planning professionals and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11**    **Project management and finance:** Demonstrate knowledge and understanding of the planning and development principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12**    **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of contemporary changes.

**Programme Specific Outcomes (PSOs)**

- PSO1.**    Explain the physical, socio-economic, environmental, legal and institutional dimensions of an urban area and a region as well as their complexities of governance.
- PSO2.**    Demonstrate the use of contemporary software like Geo-Informatic System (GIS) in spatial planning, infrastructure management and transport planning as well as utilizing Storytelling techniques for effective case presentation in planning studios.
- PSO3.**    Formulate an urban and regional plan through live case studies by analysing and evaluating comprehensive as well as micro level development issues.
- PSO4.**    Apply the principles of soft skills like creative thinking, team building, leadership and decision making in career development.

**Supporting document for PSOs (Programme Specific Outcomes)  
Masters of Planning (Urban and Regional)**

PSO 1			PSO 2		PSO 3		PSO4	
Explain the physical, socio-economic, environmental, legal and institutional dimensions of an urban area and a region as well as their complexities of governance.			Demonstrate the use of contemporary software like Geo-Informatic System (GIS) in spatial planning, infrastructure management and transport planning as well as utilizing Storytelling techniques for effective case presentation in planning studios.		Formulate an urban and regional plan through live case studies by analysing and evaluating comprehensive as well as micro level development issues.		Apply the principles of soft skills like creative thinking, team building, leadership and decision making in career development.	
Basic Planning Courses	Planning Fundamental Courses	Inter-disciplinary domain	Technical Planning	Spatial Planning/ Design	Development Plan Preparation	Management /Governance Courses	NTCC Courses	Value added courses
Planning History and Theory	Socio-Economic Dimensions in Planning	Demography and Quantitative Analysis	Planning Techniques and Computer Applications	Transportation Planning and Management	Planning Studio-I	Land Management and Real Estate	Professional Training	Basics of Communication
Community Participation in Planning	Housing and Environmental Planning	Statistical Data Analysis in Planning (Elective)	Infrastructure Planning and Management	Urban Design, Renewal and Conservation (Elective)	Planning Studio-II	Project Planning and Finance Management	Infographic and Storytelling Techniques (Elective)	Corporate Communication
-	Regional Planning and Development	Settlement Anthropology and Inclusive Development (Elective)	Application of Geoinformatics	Special Area Planning (Elective)	Planning Studio-III	Resilience and Planning	-	Interpersonal Communication
-		Planning Legislation	-	Smart Cities and Advanced	Planning Thesis	Public Policy in Planning	-	Leading Through Teams

		tion and Profess ional Practic e		Technolog ies for emerging planning issues (Elective)				
-	-	-	-	-	Eco- Tourism (Electiv e)	Environ mental Impact Assessm ent (Elective )	-	Behaviou ral Commun ication & Relations hip Manage ment
-	-	-	-	-	-	Urban and Regional Governance	-	Self- Develop ment & Interpers onal Skills
-	-	-	-	-	-	-	-	Foreign Business Language I, II, III

**PROFESSIONAL TRAINING / SUMMER INTERNSHIP**

Students must undergo a Professional training during their summer break after second semester. They will need to submit their professional training / summer internship report immediately at the onset of third semester in first week of August. Student will have to present a seminar on the same which would be evaluated by the Jury.

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN4101	Planning History and Theory	2	1	-	-	2
PLN4102	Socio-Economic Dimensions in Planning	2	1	-	-	2
PLN4103	Planning Techniques and Computer Applications	1	-	-	2	2
PLN4104	Infrastructure Planning and Management	2	1	-	-	2
PLN4105	Housing and Environmental Planning	2	1	-	-	2
PLN4108	Planning Studio-I (i) Area Planning (ii) Village Development Plan	2	-	8	-	10
<b>Electives (Any One)</b>						<b>2</b>
PLN4109	Community Participation in Planning	1	-	-	2	2
PLN4110	Infographic and Storytelling Techniques	1	-	-	2	2
PLN4111	Eco-Tourism	1	-	-	2	2
<b>Open Electives</b>						<b>5</b>
CSS4151	Basics of Communication	1	-	-	-	1
BEH4151	Self Development & Interpersonal Skills	1	-	-	-	1
LAN4151	Foreign Business Language-I French-I	3	-	-	-	3
LAN4152	German-I					
LAN4153	Spanish-I					
LAN4154	Russian-I					
LAN4155	Chinese-I					
LAN4156	Portuguese-I					
LAN4157	Korean-I					
LAN4158	Japanese-I					
LAN4159	Hindi-I **					
<b>TOTAL</b>						<b>27</b>

\*\* Hindi as Foreign Language for Foreign National Students



## SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN4208	Application of Geoinformatics	1	-	-	2	2
PLN4209	Regional Planning and Development	2	1	-	-	2
PLN4210	Land Management and Real Estate	2	1	-	-	2
PLN4211	Transportation Planning and Management	2	1	-	-	2
PLN4212	Demography and Quantitative Analysis	2	1	-	-	2
PLN4206	Planning Studio-II Urban Planning	2	-	8	-	10
<b>Electives (Any One)</b>						<b>2</b>
PLN4213	Special Area Planning	1	-	-	2	2
PLN4214	Statistical Data Analysis in Planning	1	-	-	2	2
PLN4215	Urban Design Renewal and Conservation	1	-	-	2	2
<b>Open Electives</b>						<b>5</b>
CSS4251	Corporate Communication	1	-	-	-	1
BEH4251	Behavioral Communication & Relationship Management	1	-	-	-	1
LAN4251	Foreign Business Language-II	3	-	-	-	3
LAN4252	French-II					
LAN4253	German-II					
LAN4254	Spanish-II					
LAN4255	Russian-II					
LAN4256	Chinese-II					
LAN4257	Portuguese-II					
LAN4258	Korean-II					
LAN4259	Japanese-II					
	Hindi-II					
<b>TOTAL</b>						<b>27</b>

## THIRD SEMESTER

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours	Practical (P) Hours per week	Total Credits
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				<b>per week</b>		
PLN4302	Project Planning and Finance Management	2	1	-	-	2
PLN4304	Public Policy in Planning	2	1	-	-	2
PLN4308	Resilience and Planning	2	1	-	-	2
PLN4309	Urban and Regional Governance	2	1	-	-	2
PLN4310	Research Methodology and Thesis Planning	1	-	2	-	2
PLN4307	Planning Studio-III Regional Planning	2	-	8	-	10
<b>Electives (Any One)</b>						<b>2</b>
PLN4311	Settlement Anthropology and Inclusive Development	1	-	-	2	2
PLN4312	Smart Cities and Advanced Technologies for Emerging Planning Issues	1	-	-	2	2
PLN4313	Environmental Impact Assessment	1	-	-	2	2
<b>Open Electives</b>						<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	-	1
BEH4351	Leading Through Teams	1	-	-	-	1
LAN4351	Foreign Business Language-III	2	-	-	-	2
LAN4352	French-III					
LAN4353	German-III					
LAN4354	Spanish-III					
LAN4355	Russian-III					
LAN4356	Chinese-III					
LAN4357	Portuguese-III					
LAN4358	Korean-III					
LAN4359	Japanese-III					
	Hindi-III					
<b>TOTAL</b>						<b>26</b>

#### FOURTH SEMESTER

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Studio (S) Hours per week	Practical (P) Hours per week	Total Credits
PLN4403	Planning Legislation and Professional Practice	2	1	-	-	2
PLN4437	Planning Thesis	2	-	16	-	18
<b>TOTAL</b>						<b>20</b>

## Syllabus – First Semester

	<b>PLANNING HISTORY AND THEORY (PLN4101)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Planning Theory -II (B.Plan.)					
Co-requisites	-					

### **Catalog Description**

The aim of this course is to initiate the student to the historic growth and development of urban and regional settlements, the evolution of civic planning through theories and concepts of contemporary planning thoughts. At the end of the course students will be able to integrate planning theories to current and future planning practises. The course will be delivered through theoretical inputs, class discussions and seminar presentations by students on selected topics.

### **Course Objectives**

The objective of this course is

1. To assess human settlements and its evolution.
2. To critically evaluate urban and regional planning theory models.

### **Course Outcomes**

On completion of this course, the students will be able to

- CO1: Comprehend evolution of settlements and need for town and country planning.
- CO2: Appraise theories and models of urban settlements planning.
- CO3: Apply theories and models of regional settlement planning.
- CO4: Utilize concept of city region while working on particularly bigger cities.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Evolution of Human Settlements</b></p> <p>Definitions of Settlements and their types; Origin and growth of cities; factors affecting the growth of cities; Settlements in Different Civilizations, Overview of City Planning in Mesopotamian, Egyptian, Greek and Roman Civilizations. Renaissance and Its Impact on City Form and Structure, Town Planning Thought and Principles in Ancient and Medieval India, Post Industrial Revolution Settlement Planning: Impact of Industrial Revolution on City Form, Population Density and Infrastructure Breakdown, Birth of Town and Country Planning.</p>	L1, L2 L3	9
<p><b>MODULE 2: Theories of Settlements in Urban Context</b></p> <p>Concepts of City Form- Concepts of Garden City, City Beautiful, Linear City and others. Contribution to Modern City Planning by Lewis Mumford, Patrick Geddes, Peter Hall, Jane Jacobs, Chadwick and others, Theories of Urban Structure and Land Use- Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory, Land Use and Land Value Theory etc.</p>	L1, L2 L3	9
<p><b>MODULE 3: Theories of Settlements in Regional context</b></p> <p>Spatial Models of Location, Size and Spacing of Settlements; Rank Size Rule; Central Place Theory; Loschian Theory; Cumulative Causation Theory; Core Periphery Model; Growth Poles and Centres; Gravity Model; Classification of Settlements at regional level.</p>	L1, L2 L3	9
<p><b>MODULE 4: Concept of City Region</b></p> <p>Definitions, City-Region Relationships, Structure of City Regions, Area of Influence, Dominance; Rural-Urban Fringes; Metropolitan Region; Socio-Economic Impacts of Growth of Urban Areas; Push and Pull Factors; Rural-Urban Migration; Location of New Regional Economic Activities; Impact of Technology on Urban Forms; Transportation and Urban Form; Other Emerging Issues with respect to city-region planning.</p>	L1, L2 L3	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Healey, P. (2012). Readings in Planning Theory. *Planning Theory & Practice*, 13(2), 342–343. <https://doi.org/10.1080/14649357.2012.669994>
2. Levy, J. M. (2015). *Contemporary Urban Planning*. Contemporary Urban Planning. Routledge. <https://doi.org/10.4324/9781315664453>
3. *Urban Planning Theory Since 1945*. (2012). *Urban Planning Theory Since 1945*. SAGE Publications Ltd. <https://doi.org/10.4135/9781446218648>

### References

1. Fainstein, S. S. (2000). New directions in planning theory. *Urban Affairs Review*, 35(4), 451–478. <https://doi.org/10.1177/107808740003500401>
2. Fainstein, S. (2005). Planning theory and the city. *Journal of Planning Education and Research*, 25(2), 121–130. <https://doi.org/10.1177/0739456X05279275>
3. Fischler, R. (2000). Linking planning theory and history: The case of development control. *Journal of Planning Education and Research*, 19(3), 233–241. <https://doi.org/10.1177/0739456x0001900302>
4. Goonewardena, K. (2003). The future of planning at the “end of history.” *Planning Theory*, 2(3), 183–224. <https://doi.org/10.1177/147309520323004>
5. Hall, P., & Tewdwr-Jones, M. (2019). *Urban and regional planning*. *Urban and Regional Planning* (pp. 1–348). Taylor and Francis. <https://doi.org/10.4324/9781351261883>

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	--	--	--	--	--	--	--	--	--	1	--	2	--
CO2	1	2	2	--	--	--	--	--	--	--	--	--	1	--	2	--
CO3	1	2	2	--	--	--	--	--	--	--	--	--	1	--	2	--
CO4	1	2	2	--	--	--	--	--	--	--	--	--	1	--	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SOCIO-ECONOMIC DIMENTIONS IN PLANNING (PLN4102)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Settlement Sociology (B.Plan.)					
Co-requisites	Elements of Economics (B.Plan.)					

### **Catalog Description**

The aim of this course is to offer exposure to concepts, theories and issues relating to socio-economic aspects towards planning of settlements. It also provide insight to society and regional economy and its significance in spatial planning. At the end of the course the students will be able to effectively utilise socio-economic component for sustainable and inclusive planning.

### **Course Objectives**

The objective of this course is

1. To comprehend sociological concepts in the context of planning.
2. To apply development economics in spatial planning.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Grasp important sociological concepts relating to planning.

CO2: Relate sociological concepts and theories with reference to urban & regional planning.

CO3: Apply basic principles of economics in planning.

CO4: Analyse economics of location in planning.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Sociology and Anthropology</b></p> <p>Definitions and scope of sociology; Concept of Sociology, Social system, social institutions and organisations, contemporary sociological theories, social change, social relations, social stratification and social inequality, Marginalised, weak and vulnerable social groups; Concept of space and people, Principles of anthropology with the discipline of Planning, involving people in development process and implementations, identification of community needs.</p>	L1, L2 L3	9
<p><b>MODULE 2: Urban Sociology and Urban Anthropology</b></p> <p>Industrial Revolution and the Birth of Urban Sociology; Urbanism and Urban Sociology; Urban Anthropology and its various dimensions; Disparities and Equal Opportunities: <i>Disparities</i> – Gender, Race, Religion, Social Disparities; <i>Gender</i> – Gender Discrimination; Feminist Planning Theory; <i>Caste and Religion</i> – Characteristics, Disadvantaged Castes and Ethnic Minorities; <i>Special Needs</i> – Lack of Supportive Assistance, Issues; Assessing Specific and Special Needs; Planning and Designing for the Differently Abled, Elderly, Children, and Pregnant Women; Planning Rights and Responsibilities; Provision of Equal Opportunities; Social Sustenance; Social Impact Assessment.</p>	L1, L2 L3	9
<p><b>MODULE 3: Economics</b></p> <p>Economics related to Urban and Regional Planning. Basics of Micro v/s Macro Economics; Twin Themes of Economics – Scarcity and Efficiency; Market Demand and Supply; Equilibrium in the Market; Elasticity of Demand and Supply; Price, Income and Cross Elasticity; Average, Marginal and Total Costs and Revenue; Use of economics in spatial planning; Basic Economic Growth Models (concept only), cost-benefit analysis , Quality of life, Human Development Index;.</p>	L1, L2 L3	9

<p><b>MODULE 4: Economics of Location and Planning</b></p> <p>Concept of land economics, Concept of Spatial and Regional Economics; economic principles of land uses, relevance of spatial planning; Market mechanism and land use pattern; locational theories of economics in inter-regional and intra-regional context.</p>	<p>L1, L2 L3</p>	<p>9</p>
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*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

1. Benjamin, S. (2008). Occupancy urbanism: Radicalizing politics and economy beyond policy and programs. In *International Journal of Urban and Regional Research* (Vol. 32, pp. 719–729). <https://doi.org/10.1111/j.1468-2427.2008.00809.x>
2. Harris, R. (2003). Urban and Regional Economics. *Local Economy: The Journal of the Local Economy Policy Unit*, 18(3), 274–275. <https://doi.org/10.1080/0269094032000069460>
3. Lopes De Souza, M. (2010). Which right to which city? In defence of political-strategic clarity. *Interface*, 2(1), 315–333. Retrieved from <http://www.google.fr/url?sa=t&rct=j&q=which right to which city ? in defence of political-strategic clarity&source=web&cd=1&ved=0CCQQFjAA&url=http://interfacejournal.nuim.ie/wordpress/wp-content/uploads/2010/11/Interface-2-1-pp315-333-Souza.pdf&ei=z2yWUKy>
4. *The Urban Sociology Reader*. (2012). *The Urban Sociology Reader*. Routledge. <https://doi.org/10.4324/9780203103333>

### **References**

1. Dempsey, N., Bramley, G., Power, S., & Brown, C. (2011). The social dimension of sustainable development: Defining urban social sustainability. *Sustainable Development*, 19(5), 289–300. <https://doi.org/10.1002/sd.417>
2. Ioannides, Y. M. (2003). Handbook of Regional and Urban Economics. *Regional Science and Urban Economics*, 33(1), 121–125. [https://doi.org/10.1016/s0166-0462\(02\)00056-x](https://doi.org/10.1016/s0166-0462(02)00056-x)
3. Harvey, D. (2003). The right to the city. *International Journal of Urban and Regional Research*, 27(4), 939–941. <https://doi.org/10.1111/j.0309-1317.2003.00492.x>



## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	2	--	2	--	--	--	--	--	--	1	--	2	--
CO2	1	2	2	2	--	2	--	--	--	--	--	--	1	--	2	--
CO3	1	2	2	2	--	2	--	--	--	--	--	--	1	--	2	--
CO4	1	2	2	1	--	2	--	--	--	--	--	--	1	--	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING TECHNIQUES AND COMPUTER APPLICATIONS (PLN4103)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	1	0	2	0	2
Pre-requisites/Exposure	Techniques of Planning I & II (B.Plan.)					
Co-requisites	Computer Aided Design (CAD) in Planning (B.Plan.)					

### **Catalog Description**

The aim of this course is to introduce and be familiar with techniques used for planning at various stages from preliminary to advanced. Students will learn appropriate data mining for their studio exercises, pre-preparation for planning field visits and selecting analysis techniques. Appropriate Software applications in CAD and GIS are also part of the course. They will be able to apply excel, CAD and GIS in their planning studio. At the end of the course student should be able to use all the learnt techniques in respective planning studio works.

### **Course Objectives**

The objective of this course is

1. To prepare students for planning studio exercise by providing them significant base of planning techniques.
2. To equip students with key skill set for conducting filed visits, data collection and analysis.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Explore and use various planning information systems available.

CO2: Prepare base maps for their studio exercise and to do effective pre-field visit planning.

CO3: Apply excel and Cad techniques in planning studios.

CO4: Perform basic analysis and map preparations in GIS.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Information Systems for Planning and Literature Review</b></p> <p>Introduction to Basic Terminologies used in Planning; Definition and components of Information System in Planning; Data warehousing and Data mining for Planning; various data sources like, National Urban Information System – Bhuvan, Natural Resource Data Management System, National Sample Survey (NSSO), Directorate of Economics and Statistics, Census of India, National Family Health Survey (NRHS), Central Pollution Control Boards reports, Indian Metrology Department, World Bank Open Data; Introduction and utilisation of spatial standards-URDPFI; Components and Techniques of literature review; Finding useful insights from the literature review; Exercises on inscribing and presenting reviewed literature</p>	L1, L2 L3	9
<p><b>MODULE 2: Basemap Preparation and Survey Techniques</b></p> <p>Base map Preparation: Representation of Spatial Data; Choice of Appropriate Scales: Graphical, Linear and Areal Scales; Contents of Base Maps at Various Scales; Notations - Basic Disciplines of Maps; Setting of Goals and Objectives; Methodologies for Preparation of Urban Regional Development Plans, Plan Implementation Techniques; Selecting appropriate Indicators; Preparation of Checklist for data collection; Preparation of good Questionnaire; Data coding and methods for data analysis.</p>	L1, L2 L3	9
<p><b>MODULE 3: Computer Applications in Planning</b></p> <p>Computer Applications for Data Collection and Analysis: Tools of Analyzing Different Types of Data; Use of Excel Software for Analyzing Data; Applications of Features of Excel- Basic and Selected Advanced Features; CAD Applications for Base Map preparation: Applications of CAD tools- drawing, editing, modifying, layer</p>	L1, L2 L3	9

management etc.; Scaling Drawings and Images; Plotting and Printing technicalities.		
<b>MODULE 4: Introduction to Geoinformatics</b> Image Interpretation – Qualitative and Quantitative Elements; Resolutions – Spatial, Temporal, Spectral, Radiometric; Geo-Rectification – Coordinate System, Selection of Ground Control Points (GCPs), Geo-Referencing and Map Projections; Geometric Distortions, Spatial Data Presentation Techniques: Layout Preparation – Grids, Legend, Symbology; Printing – Sheet, Size, Scale.	L1, L2 L3	9

*\*Bloom’s Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

1. Government of India (2008), NSDI Metadata standard-NNRMS Secretariat, Department of Space, India

### **References**

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5. Miller, D., & Salkind, N. (2012). Qualitative Data Analysis Software. In *Handbook of Research Design & Social Measurement* (pp. 165–179). SAGE Publications, Inc. <https://doi.org/10.4135/9781412984386.n38>
6. Shade, J. (2010). Software for data analysis. *Journal of Applied Statistics*, 37(8), 1421–1422. <https://doi.org/10.1080/02664760902899790>

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination****Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2	--	--	1	--	--	--	--	--	1	--	2	--
CO2	1	2	1	2	--	--	1	--	--	--	--	--	1	--	2	--
CO3	1	2	1	2	--	--	1	--	--	--	--	--	1	--	2	--
CO4	1	2	1	2	--	--	1	--	--	--	--	--	1	--	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>INFRASTRUCTURE PLANNING AND MANAGEMENT (PLN4104)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Infrastructure Planning, Development and Management (B.Plan)					
Co-requisites	-					

### **Catalog Description**

The course would include three sub-components of infrastructure and utility Planning i.e. Physical Infrastructure, Social Infrastructure and Transportation. The aim of this course is on principles of design of utilities and services in urban and regional context and familiarising with Indian standards. The course will focus on acquainting students to assess infrastructure planning techniques and their utilisation in planning studios. The objective of Transportation Planning module is to provide basic information on transportation issues. Students will be familiarized with (i) geometric design of road networks and (ii) traffic characteristics. Techniques of data collection and analysis would be taught as part of this course.

### **Course Objectives**

The objective of this course is

1. To familiar with infrastructure and its sub-sector Planning.
2. To utilize the knowledge in physical planning studios.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Comprehend concept of infrastructure planning and its relevance in physical planning.

CO2: Identify and project the demand and spatial need of physical infrastructure

CO3: Assess the need for social infrastructure for sustainable and inclusive planning.

CO4: Utilise transport planning techniques.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Introduction to Infrastructure Planning</b></p> <p>Importance of Infrastructure, objectives of the utilities, services planning and implications on public health and environment; Economic-introduction to policies and programmes in infrastructure planning; issues and concerns of maintaining the utilities and services, need and importance of service level benchmarks of water supply, sanitation, sewage, solid waste and transportation; Impact of technology on infrastructure, Green infrastructure and its significance.</p>	L1, L2 L3	9
<p><b>MODULE 2: Physical Infrastructure</b></p> <p>Role of physical planner in planning of utilities and services; water supply distribution system, storm water drainage system, sewerage system, solid waste management, electricity distribution system.</p>	L1, L2 L3	9
<p><b>MODULE 3: Social Infrastructure</b></p> <p>Types of social infrastructure; Health care-essential service, availability, access and utilisation, standards, public and private institutions, policies, national Rural Healthcare Mission, Hierarchy of health care establishments, Education-primary, secondary educational institutions, standards, policies, rights to education (RTE); Public and community spaces-recreational, safety and security – fire management.</p>	L1, L2 L3	9
<p><b>MODULE 4: Transportation</b></p> <p>Introduction to transport and travel; Understanding travel from the mobility, economic, social-psychologist, time/space perspective; Transportation planning process; Introduction to four stage modelling; land use and transportation integration; Demand and Supply of Transport; Congestion pricing, transit-oriented development, transport Pricing, Basic transport economic Model. Role of NHAI in regional transport.</p>	L1, L2 L3	9

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

## Text Books

1. Broaddus, A., & Cervero, R. (2019). Transportation planning. In *The Routledge Handbook of International Planning Education* (pp. 253–264). Taylor and Francis. <https://doi.org/10.4324/9781315661063-22>
2. Criqui, L. (2015). Infrastructure urbanism: Roadmaps for servicing unplanned urbanisation in emerging cities. *Habitat International*, 47, 93–102. <https://doi.org/10.1016/j.habitatint.2015.01.015>
3. Loucks, D. P., & van Beek, E. (2017). *Water Resource Systems Planning and Management*. Water Resource Systems Planning and Management. Springer International Publishing. <https://doi.org/10.1007/978-3-319-44234-1>
4. Parkin, J., & Koorey, G. (2012). Network planning and infrastructure design. In *Transport and Sustainability* (Vol. 1, pp. 131–160). Emerald Group Publishing Ltd. [https://doi.org/10.1108/S2044-9941\(2012\)0000001008](https://doi.org/10.1108/S2044-9941(2012)0000001008)

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1. Allen, P. M. (2012). *Cities and regions as self-organizing systems: Models of complexity*. *Cities and Regions as Self-Organizing Systems: Models of Complexity* (pp. 1–309). Taylor and Francis. <https://doi.org/10.4324/9780203990018>
2. Rinne, M. (2004). Technology roadmaps: Infrastructure for innovation. *Technological Forecasting and Social Change*, 71(1–2), 67–80. <https://doi.org/10.1016/j.techfore.2003.10.002>
3. Thomé, A. M. T., Ceryno, P. S., Scavarda, A., & Remmen, A. (2016, December 15). Sustainable infrastructure: A review and a research agenda. *Journal of Environmental Management*. Academic Press. <https://doi.org/10.1016/j.jenvman.2016.09.080>

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

## CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2	--	--	--	--	--	--	--	--	1	--	2	--
CO2	1	2	1	2	--	--	--	--	--	--	--	--	1	--	2	--
CO3	1	2	1	2	--	--	--	--	--	--	--	--	1	--	2	--
CO4	1	2	1	2	--	--	--	--	--	--	--	--	1	--	2	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>HOUSING AND ENVIRONMENTAL PLANNING (PLN4105)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Housing and Community Planning (B.Plan.)					
Co-requisites	Ecology, Environment and Resource Development and Management (B.Plan.)					

### **Catalog Description**

The aim of this course to two-fold, i) Housing ii) Environment.

**Housing:** First segment is to impart knowledge and skills to create an efficient housing/neighborhood planning which gives equal access to housing for everyone. At the end of the course students will be able to identifies the gaps, problems in providing housing for all. They will be able to focus on various dimensions of housing sector and create efficient and sustainable residential structures and neighborhood designs.

**Environment:** Second Segment deals with environment and its planning which aims to initiate the students to a discreet understanding of the environment and its interactions with human settlements. All social, cultural and technological activities being carried by human beings have profound influence on the environment. This course will enable a thorough understanding and utilization of all these aspects.

### **Course Objectives**

The objective of this course is

1. To provide a basic understanding of Housing at the Neighborhood and City level and to create an ability to work on the Housing Sector in Town Planning System.
2. To grasp the role of public and private sector as well as community participation in eco-tourism planning and development

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Apply varied housing concepts in neighbourhood and urban planning.

CO2: Analyse policy and governance framework with reference to housing sector.

CO3: Justify the relevance of ecology, ecosystem and environment in planning.

CO4: Utilise acquired knowledge to conceptualise and to create sustainable planning designs.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Concept of Housing with reference to Planning</b></p> <p>Current Issues in Housing: Health and Safety Related Issues in Housing, Shift of Housing from Social Sector to Private Sector Participation Housing Design - Housing Typology, Housing Layouts, Housing Density, Community Facilities, Public and Private Sector Housing Development, Social Aspects of Housing, Built Environment and Human Behaviour, Housing Norms and Standards Housing for the Poor-Issues in Slums and Squatter Settlements; Government Initiatives for Providing Housing, Housing Demand- Housing Need Assessment, Estimating and Forecasting Housing Requirements (Qualitatively and Quantitatively); Understanding Current Methods of Housing Demand Assessment, Household Affordability and Concept and performance of Affordable Housing in India, Affordable Housing Policy 2009, Affordable Housing in Public Private Participation, Emerging thoughts. Case Studies of Neighbourhood Planning in Indian and Global Context.</p>	L1, L2 L3	9
<p><b>MODULE 2: Housing Policies and Institutional Framework</b></p> <p>Understanding Five Year Plans with respect to Housing Policy, National Housing Policy- Review, Policy Framework for Urban and Rural Housing, Comparative Policy Analysis; Rental Housing in India: An Overview, Current Practices and Upcoming Initiatives; Role of Informal Sector in Housing Stock, Economy, Commercial Activities, Etc.; Implications in Physical Planning, Informal Sector Housing and Basic Needs - Lack of Essential Infrastructure; Poor Condition of Existing Services; Identification of Basic Needs; Provision for Various Target Groups; Standards for Basic Needs; Investment for Housing; Essential Components; Ownership and Tenure Security; Service Delivery - Gaps in Existing Institutional Systems of Delivery; Sustainable Development Goals with reference to Housing for All.</p>	L1, L2 L3	9

<p><b>MODULE 3: Environmental Components and Resources</b></p> <p>Environmental resources and ecosystem services; Fundamentals of Ecosystem-Its Structure and Function; Consumption, conservation and recycling of resources; Man, and Environment interrelations; Changing Perspectives in Man-Environment Relationship with Focus on Issues of Population, Urbanization, Resource Depletion and Pollution; Concept of Ecology; Environmental Degradation (Environmental Concerns and Challenges) and Its Impact on Various Ecosystems.</p>	<p>L1, L2 L3</p>	<p>9</p>
<p><b>MODULE 4: Environmental Planning</b></p> <p>Planning for Global and Local environmental concerns; Planning for Environmentally Sensitive Zones (Resources Availability, Settlements Pattern, Problems and Potentials, Regulating Mechanisms for Development); Carrying Capacities in environmental context; Tools and Techniques for Environmental Planning and Management- Brief Introduction to Environmental Impact Assessment, Strategic Environment Assessment and Environmental Management Plans; Providing brief about environmental policies; Green Agenda and Global environmental movements.</p>	<p>L1, L2 L3</p>	<p>9</p>

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Choguill, C. L. (2008). Developing sustainable neighbourhoods. *Habitat International*, 32(1), 41–48. <https://doi.org/10.1016/j.habitatint.2007.06.007>
2. Department of Planning and Infrastructure: WA Planning Commission. (2009). Liveable neighbourhoods. *World Transport Policy and Practice*, 7(January), 38–43.
3. Glaeser, E. L., Gyourko, J., & Saks, R. E. (2006). Urban growth and housing supply. *Journal of Economic Geography*, 6(1), 71–89. <https://doi.org/10.1093/jeg/lbi003>
4. Haffner, M., & Heylen, K. (2011). User costs and housing expenses. towards a more comprehensive approach to affordability. *Housing Studies*, 26(4), 593–614. <https://doi.org/10.1080/02673037.2011.559754>
5. Steele, M. (2012). Housing statistics. In *International Encyclopedia of Housing and Home* (pp. 620–626). Elsevier. <https://doi.org/10.1016/B978-0-08-047163-1.00639-1>
6. Turner, A. (1980). Community development. *The Cities of the Poor; Settlement Planning in Developing Countries*, 35–64. [https://doi.org/10.5005/jp/books/12932\\_9](https://doi.org/10.5005/jp/books/12932_9)

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1. Albert, S. (2010). The geographic determinants of housing supply. *Quarterly Journal of Economics*, 125(3), 1253–1296. <https://doi.org/10.1162/qjec.2010.125.3.1253>
2. Dempsey, N. (2008). Quality of the built environment in urban neighbourhoods. *Planning Practice and Research*, 23(2), 249–264. <https://doi.org/10.1080/02697450802327198>
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4. Saxena, A. (2013). Understanding Inequalities: Stratification and Differences. *INTERNATIONAL SOCIOLOGY*.
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### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	2	2	1	1	--	--	--	--	--	1	2	2	--
CO2	2	2	1	2	2	1	1	--	--	--	--	--	1	2	2	--
CO3	2	2	1	2	2	1	1	--	--	--	--	--	1	2	2	--
CO4	2	2	1	2	2	1	1	--	--	--	--	--	1	2	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING STUDIO-I (AREA PLANNING, VILLAGE DEVELOPMENT PLAN) (PLN4108)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	0	0	8	10
Pre-requisites/Exposure	Planning and Design Lab – V (Area Planning)					
Co-requisites	-					

### **Catalog Description**

The planning studio is an introductory studio for giving basic idea related to urban and regional planning studios. It aims to bring students of diverse backgrounds to a common platform and develop the essential skills of planning amongst the students opting for different specializations of planning. The objective of the studio is to introduce the general concepts associated with physical planning and develop the skills of data collection, data analysis, spatial representation, documentation as well as written and verbal communication. Students will be able to apply the knowledge gained through theoretical subjects in their studio planning.

### **Course Objectives**

The objective of this course is

1. To relate theoretical knowledge of planning with planning practices.
2. To conceptualize and prepare development plan for the given levels.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Preparation of Area Plan/Zonal Plan in urban context.

CO2: Preparation of Village Development Plan.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Area Planning (Urban Context)</b></p> <p>The assignment would identify different urban zones based on land use characteristics and could also include predefined ‘zones’ for zonal plans. The objective of this exercise would be to learn various methods of surveying to collect different types of data and represent and interpret them to give meaningful observations on the planning and development of the area.</p> <p>Thrust of the exercise would be on:</p> <ul style="list-style-type: none"> <li>• Understanding the zone in the context of the city.</li> <li>• Mapping of Regional Networks and Linkages</li> <li>• Preparation of Base Map of the area through primary surveys and updating secondary data</li> <li>• Socio-economic profiling of the area through surveys</li> <li>• Physical and Social infrastructure mapping</li> <li>• Gap Analysis and issue identification</li> <li>• Formulation of broad outlines of Intervention Strategies and Development Blueprint.</li> </ul>	L4, L5 L6	60
<p><b>MODULE 2: Rural Planning</b></p> <p>The main goal of the assignment is to expose students to the life and living in rural area as it is different from urban areas. This would help in conceptualising the integration of urban and rural areas for regional planning. Students will undertake study of a particular village in groups and conduct a primary survey on demographic profile, household income level, socio-cultural practices, etc. Information about development programmes shall be collected and resource mapping will be done. This exercise will aim at improving the understanding about the requirements of different categories of rural population. Conducting the primary survey will provide exposure to research methodology, techniques of data collection, data processing and analysis.</p> <p>Thrust of the exercise would be on:</p>	L4, L5 L6	60

<ul style="list-style-type: none"> <li>• Understanding the socio-economic aspects of the rural settlement</li> <li>• Importance of location, spatial and economic linkages of the village.</li> <li>• Explaining the social and physical infrastructure of the village.</li> <li>• Understanding the availability and usage of local resources.</li> <li>• Exposure to government programmes and institutional mechanism working for rural</li> <li>• planning and development</li> <li>• Identifying the present problems and future possibilities in the village.</li> <li>• Proposing a strategy of improvement in the condition and development of the villages.</li> </ul>		
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\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Broaddus, A., & Cervero, R. (2019). Transportation planning. In *The Routledge Handbook of International Planning Education* (pp. 253–264). Taylor and Francis. <https://doi.org/10.4324/9781315661063-22>
2. Criqui, L. (2015). Infrastructure urbanism: Roadmaps for servicing unplanned urbanisation in emerging cities. *Habitat International*, 47, 93–102. <https://doi.org/10.1016/j.habitatint.2015.01.015>
3. Loucks, D. P., & van Beek, E. (2017). *Water Resource Systems Planning and Management*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-44234-1>
4. Parkin, J., & Koorey, G. (2012). Network planning and infrastructure design. In *Transport and Sustainability* (Vol. 1, pp. 131–160). Emerald Group Publishing Ltd. [https://doi.org/10.1108/S2044-9941\(2012\)0000001008](https://doi.org/10.1108/S2044-9941(2012)0000001008)

### References

1. Allen, P. M. (2012). *Cities and regions as self-organizing systems: Models of complexity*. *Cities and Regions as Self-Organizing Systems: Models of Complexity* (pp. 1–309). Taylor and Francis. <https://doi.org/10.4324/9780203990018>
2. Andersson, E., Barthel, S., Borgström, S., Colding, J., Elmqvist, T., Folke, C., & Gren, Å. (2014). Reconnecting cities to the biosphere: Stewardship of green

infrastructure and urban ecosystem services. *Ambio*, 43(4), 445–453.

<https://doi.org/10.1007/s13280-014-0506-y>

- Rinne, M. (2004). Technology roadmaps: Infrastructure for innovation. *Technological Forecasting and Social Change*, 71(1–2), 67–80.

<https://doi.org/10.1016/j.techfore.2003.10.002>

- Thomé, A. M. T., Ceryno, P. S., Scavarda, A., & Remmen, A. (2016, December 15). Sustainable infrastructure: A review and a research agenda. *Journal of Environmental Management*. Academic Press. <https://doi.org/10.1016/j.jenvman.2016.09.080>

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	P -1	P -2	S	R	CE	A	ESE
Weightage (%)	50	50	60	20	15	05	200

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO2	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO3	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO4	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>COMMUNITY PARTICIPATION IN PLANNING (PLN4109) (ELECTIVE)</b>	L	T	P	S	C
Version 1.1		1	0	2	0	2
Pre-requisites/Exposure	Settlement Sociology					
Co-requisites	Planning and Design Lab -V, B. Plan					

### **Catalog Description**

The aim of this course is to offer assessment of communities, their crucial role in planning process and successful implementation. This particular subject will be very useful for learning techniques of primary data collection for planning studio exercises. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course will be inculcating students with the capabilities of effective community interaction and getting their support in data collection. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on experimentations. During the course, students will be working with small communities either urban or rural, conducting participatory meetings with them and formulating a small project with the help of community participation. Finally, students will demonstrate project to the concerned faculties, participatory community and other key stakeholders. They will be able to choose and apply the most effective PRA techniques for data collection. They will incorporate and utilise important insights provided by the local communities in plan formulation. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

1. To grasp effective role of community participation in planning process and plan implementation.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Apply community participation techniques during field visits for primary data collection.

CO2: Prepare the detail report and presentation on a given project related to Community participation.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Concept and Techniques of Community Participation</b></p> <p>Definitions and diverse dimensions of communities; Understanding concept of social inclusion and participatory planning process, Techniques of effective communication and engaging communities in planning process; Role of community based organisations in participatory planning such as NGOs, Residents welfare associations (RWA), Self-help groups (SHG), Gram-panchayat; Techniques of conducting Participatory Rural Appraisal (PRA).</p>	L3, L4 L5	12
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Conducting community participation exercises in small groups with varied stakeholders, Organising consultative meetings, Focus group discussion, Preparing small scale project with the help of local community and demonstration of the same. Collection of data through primary sources; Conducting survey; Database development; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L3, L4, L5	24

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

1. Docherty, I., Goodlad, R., & Paddison, R. (2001). Civic culture, community and citizen participation in contrasting neighbourhoods. *Urban Studies*, 38(12), 2225–2250. <https://doi.org/10.1080/00420980120087144>
2. Gaventa, J. (2004). Towards participatory governance: assessing the transformative possibilities. *Participation: From Tyranny to Transformation?: Exploring New Approaches to Participation in Development*, 25–41.

3. Heritage, Z., & Dooris, M. (2009). Community participation and empowerment in Healthy Cities. *Health Promotion International*, 24 Suppl 1. <https://doi.org/10.1093/heapro/dap054>
4. Narayanasamy, N. (2008). *Participatory rural appraisal: Principles, methods and application*. *Participatory Rural Appraisal: Principles, Methods and Application* (pp. 1–364). SAGE Publications Inc. <https://doi.org/10.4135/9788132108382>

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1. Chambers, R. (1994). The origins and practice of participatory rural appraisal. *World Development*, 22(7), 953–969. [https://doi.org/10.1016/0305-750X\(94\)90141-4](https://doi.org/10.1016/0305-750X(94)90141-4)
2. Head, B. W. (2007). Community engagement: Participation on whose terms? *Australian Journal of Political Science*, 42(3), 441–454. <https://doi.org/10.1080/10361140701513570>
3. Irvin, R. A., & Stansbury, J. (2004, January). Citizen Participation in Decision Making: Is It Worth the effort? *Public Administration Review*. <https://doi.org/10.1111/j.1540-6210.2004.00346.x>

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>INFOGRAPHIC AND STORYTELLING TECHNIQUES (PLN4110) (Elective)</b>	L	T	P	S	C
Version 1.1		1	0	2	0	2
Pre-requisites/Exposure	Planning and Design Lab I, B. Plan					
Co-requisites	Planning and Design Lab -V, B. Plan					

### **Catalog Description**

The aim of this course is to offer opportunities and skillset in effective infographics and storytelling techniques. This particular subject will be greatly useful in planning and producing effective studio sheets. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course will be evolving rationale thinking capabilities of the students with respect to delivering students' findings/insights and the best presentation method. The course would be conducted through literature survey, case studies, and hands on exercises with available infographic software in the university. During the course, students will be working in interdisciplinary groups. In this course, students will discuss how to incorporate a story in their presentation to help them capture the attention of the audience. They will be able to choose and apply the most effective analytical method for delivering their insights/ideas. They will incorporate data visualization best practices and use tips and tricks when presenting at various platforms to decision makers and stakeholders.

### **Course Objectives**

The objective of this course is

1. To equip students with infographic techniques for effective presentation skills and delivering communicable insights.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Apply story telling techniques in planning studio presentations for synthesizing research findings and develop effective insights

CO2: Utilise infographics techniques in the preparation of the detail report and presentation on a given project.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Synthesizing the Findings and Deriving the Insights</b>            Synthesizing findings of student research and derive valid/actionable insights, Finding story in the data, Shaping it to contribute to a compelling research presentation, Providing actionable comparisons, Weighing the pros and cons, Deriving insights to address a problem/problems, Methods for developing research-based recommendations, testing and refining ideas. Techniques of reviewing the essential sections of various reports, designing visualizations of data, Understanding the requisite for targeting specific audience, Applying storytelling strategies, Recognize the drawbacks of poor data visualization; Effective ways of communicating research/findings.</p>	L3, L4 L5	12
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

**Text Books**

1. Cairo, A. (2012). Chapter 1 Introduction Infographics and Visualization. *Functional Art - Infographics and Visualization and Exploration*.
2. Walter, E., & Gioglio, J. (2014). *The Power of Visual Storytelling: How to Use Visuals, Videos, and Social Media to Market Your Brand. Inside Market Data* (p. 256).

- Tong, C., Roberts, R., Borgo, R., Walton, S., Laramée, R. S., Wegba, K., ... Ma, X. (2018). Storytelling and visualization: An extended survey. *Information (Switzerland)*, 9(3). <https://doi.org/10.3390/info9030065>

### References

- Cairo, A. (2012). Infographics and Visualization and exploration. *The Functional Art*, 15–25. Retrieved from <http://www.thefunctionalart.com/>
- Smiciklas, M. (2012). *The Power of Infographics: Using Pictures to Communicate and Connect with Your Audience. The power of infographics* (pp. 1–17). <https://doi.org/10.4324/9780203075609>

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>ECO-TOURISM (PLN4111) (Elective)</b>	L	T	P	S	C
Version 1.1		1	0	2	0	2
Pre-requisites/Exposure	Disaster Risk Management and Climate Change Adaptation					
Co-requisites	Planning and Design Lab -V, B. Plan					

### **Catalog Description**

The aim of this course is to offer the principles of planning for eco-tourism in the context of sustainable tourism development. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course is getting the insights of relationships between tourism and environment, tourism and urban development, tourism and economic development. In this course, students will be able to grasp planning requirements for developing sustainable eco-tourism hubs and circuits. They will be able to incorporate community needs and sustainable eco-tourism requirements in planning process. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

1. To demonstrate planning strategies in the context of sustainable tourism development for eco-tourism planning and development
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Applicate concept of eco-tourism for sustainable tourism development.

CO2: Prepare the detail report and presentation on a given project related to eco-tourism.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Introduction and Planning for Eco-Tourism</b></p> <p>Definitions, scope, nature, key determinants, characteristics; problems and prospects of eco-tourism; eco-tourism hubs in India; impacts of eco-tourism in developed and developing regions; relationship between tourism and urban development, relationship between tourism and economic development, relationship between tourism and environment; concept of carrying capacity and its significance in eco-tourism. Circuit identification and destination planning; assessment of infrastructure requirement for eco-tourism planning; analysing tourism impacts in transforming local livelihood and lifestyle; role of Government institutions and agencies in eco-tourism development.</p>	L3, L4 L5	12
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### **Text Books**

1. Cohen, E. (1978). The impact of tourism on the physical environment. *Annals of Tourism Research*, 5(2), 215–237. [https://doi.org/10.1016/0160-7383\(78\)90221-9](https://doi.org/10.1016/0160-7383(78)90221-9)
2. Dávid, L. (2011). Tourism ecology: Towards the responsible, sustainable tourism future. *Worldwide Hospitality and Tourism Themes*, 3(3), 210–216. <https://doi.org/10.1108/1755421111114217>
3. Ghasemi, M., & Hamzah, A. (2014). An Investigation of the Appropriateness of Tourism Development Paradigms in Rural Areas from Main Tourism Stakeholders' Point of View. *Procedia - Social and Behavioral Sciences*, 144, 15–24. <https://doi.org/10.1016/j.sbspro.2014.07.269>



## References

1. Jaini, N., Anuar, A. N. A., & Daim, M. S. (2012). The practice of sustainable tourism in ecotourism sites among ecotourism providers. *Asian Social Science*, 8(4), 175–179. <https://doi.org/10.5539/ass.v8n4p175>
2. Stakeholders, E. (1994). The Component of Successful Ecotourism. In *UNEP Division of Technology, Industry and Economics* (pp. 33–59).
3. Wiltshier, P., Clarke, A., Adebayo, A., Robinson, P., & Oriade, A. (2019). Community-based tourism. In *Community-Based Tourism in the Developing World* (pp. 98–112). Routledge. <https://doi.org/10.4324/9781351026383-8>

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus – Second Semester

	<b>APPLICATIONS OF GEOINFORMATICS (PLN4208)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	1	0	2	0	2
Pre-requisites/Exposure	Planning Techniques and Computer Applications					
Co-requisites	Planning Studio I, II, III and Planning Thesis					

### Catalog Description

The aim of this course is to equip students with advanced concepts of Geoinformatics with special emphasis on applications in Urban and Regional Planning. Students will have hands on experience in ArcGIS and QGIS.

### Course Objectives

The objective of this course is

1. To grab basic knowledge of Remote Sensing and GIS and relate its utilization in Urban and Regional Planning.
2. To get hands-on experience of the functions of Geoinformatics software.

### Course Outcomes

On completion of this course, the students will be able to

CO1: Describe basic knowledge and terminology of Remote Sensing and GIS

CO2: Comprehend planning Information system and its utilities.

CO3: Work on the linking of spatial and nonspecial attribute data.

CO4: Create spatial database in geoinformatics software and perform geo-spatial analysis.

Modules	Blooms level*	Number of hours
<b>MODULE 1: Introduction to Geo-informatics</b> Overview: Principles and Applications of Remote Sensing (RS); Geographic Information Systems (GIS); Organisational Aspects for Planning; Systems, Nature, Hierarchy, Value and Type of Required	L1, L2 L3	9

Spatial Data; Raster and Vector Data Structures; Spatial Data Models; Geo-Database; Global Navigation Satellite Systems; Electromagnetic Spectrum, Band Combination, Reflectance; Image Interpretation and Analysis; Integration of GIS and Digital Image Processing; Integration of GIS and GPS; Analysing Tools and Software; Ground Control Points and their selection Criteria.		
<b>MODULE 2: Planning Information System</b> Information Systems - Information Needs, Scales and Levels; Pre-Conditions for Using Planning Information Systems; Representing, Modelling and Impact Analysis of the Data; Structure Models; Query Measurement and Transformations; Summary Statistics and Inference; Terrain Modelling, Spatial Data Infrastructure Systems.	L1, L2 L3	9
<b>MODULE 3: Use of GIS Data Focusing on Urban and Regional Planning</b> Data Creation and Checking - Base Maps and Thematic Maps; Mapping and Spatial Analysis; Linking of Attribute Data, Spatial Data Aggregation; Spatial Information, Database Creation; Geo-Coding and Data Accuracy, Topology Creation; Topography and Landforms; Spatio-temporal Change Detection; Suitability Analysis; Landuse / Landcover Analysis.	L1, L2 L3	9
<b>MODULE 4: Laboratory Exercises</b> Practical Exercises – in Selected Packages of Image Processing and GIS; Georeferencing, Data Base creation, Data Linking, Performing Analysis, Working in Symbology and Thematic Map Creation, Functions and working in Layout View; Dynamic GIS; Web Enabled GIS Applications	L3, L4 L5, L6	9

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

## Text Books

1. Drummond, W. J. (1995). Extending the Revolution: Teaching Land Use Planning in a GIS Environment. *Journal of Planning Education and Research*, 14(4), 280–291. <https://doi.org/10.1177/0739456X9501400405>
2. Harris, B., & Batty, M. (1993). Locational Models, Geographic Information and Planning Support Systems. *Journal of Planning Education and Research*, 12(3), 184–198. <https://doi.org/10.1177/0739456X9301200302>
3. Holmberg, S. C. (1994). Geoinformatics for urban and regional planning. *Environment & Planning B: Planning & Design*, 21(1), 5–19. <https://doi.org/10.1068/b210005>
4. Montagu, A. S. (2001). Repackaging the revolution: Making GIS instruction relevant to planners. *Journal of Planning Education and Research*, 21(2), 184–195. <https://doi.org/10.1177/0739456X0102100206>

## References

1. Anselin, L., Syabri, I., & Kho, Y. (2006, January). GeoDa: An introduction to spatial data analysis. *Geographical Analysis*. <https://doi.org/10.1111/j.0016-7363.2005.00671.x>
2. Chapin, T. S. (2003). Revolutionizing the core: GIS in the planning curriculum. *Environment and Planning B: Planning and Design*, 30(4), 565–573. <https://doi.org/10.1068/b12993>
3. Unwin, D. J. (1996). GIS, spatial analysis and spatial statistics. *Progress in Human Geography*, 20(4), 540–551. <https://doi.org/10.1177/030913259602000408>

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	--	--	1	--	1	--	--	--	--	--	--	--	--	1	2	--
CO2	--	--	1	--	1	--	--	--	--	--	--	--	--	1	2	--
CO3	--	--	1	--	1	--	--	--	--	--	--	--	--	1	2	--
CO4	--	--	1	--	1	--	--	--	--	--	--	--	--	1	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>REGIONAL PLANNING AND DEVELOPMENT (PLN4209)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Introduction to Regional Planning (B.Plan.)					
Co-requisites	Planning and Design Lab – III (Regional Planning)					

### **Catalog Description**

The course aims to expose the theoretical basis for various concepts and analytical tools of Regional Planning and learn the practice of regional planning in the Indian context. Elements of settlement system in the regional context are also incorporated in this course. The course provides an in-depth understanding of the issues of regional development, regional disparity and the need for balanced regional development in the context of globalization and rapid economic transformations in the country. Regional policies and sectoral policies are also discussed. Metropolitan regions, districts as planning regions and rural planning issues are discussed in the wider spectrum of holistic regional planning and development.

### **Course Objectives**

The objective of this course is

1. To comprehend concepts and significance of Regional planning.
2. To provide in-depth understanding of the issues of regional development, regional disparity and the need for balanced regional development.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Explain the concepts of Region and elements of settlement system in regional context.

CO2: Describe regional equalities, their characteristics and relevance of regional planning policies.

CO3: Appreciate Regional growth process and their applications in India

CO4: Comprehend requirements and significance of rural planning as well as critically define regional plan implementation mechanism

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Concepts of Region</b></p> <p>Definition, Region Types and Regionalization; Concept of Regional Planning: Nature, Objectives, Levels and Aims; Elements of Settlement System: Function, Spacing, Linkage, Settlement Pattern and Factors Responsible Thereof; Potentials and Centrality of Settlements; Regional Inequalities – Growth, Density and Spatial Inequalities of Population Distribution, Spatial Patterns and Characteristics of Occupational Types; Regional Planning Policies and Its Relevance.</p>	L1, L2 L3	9
<p><b>MODULE 2: Economic and Regional Growth</b></p> <p>Introduction to Economic and Regional Growth Processes: Some Approaches of Rostow, Hirschman, Myrdal, Friedman, Haggerstand; Concept of Growth Centres, Growth Pole, Service Centre and Agro-Politan District and their Application in India Regional Development Strategies: Centralized and Decentralized; Regional Planning Process: Location of New Regional Economic Activities; Tools and Techniques of Regional Analysis; Metropolitan Regions- : Concept of Degree of Primacy, Area of Influence, Service Area; City Regions and Delineation Techniques; Centralization and Decentralization Processes; Concepts of Ring and Satellite Towns, Counter-Magnets; Forms and Concepts for Metropolitan Planning and Development</p>	L1, L2 L3	9
<p><b>MODULE 3: District Planning</b></p> <p>District Planning Process: Identification of Plan Objectives; Collection, Classification and Analysis of Data; Norms and Standards for District Planning; Components of District Planning in the Context of 73rd CAA, 1992, Planning Process Under District Planning Committee, Metropolitan Planning Committee; Plan Implementation: Five Year Plans and Rural Development; Planning Process, Policies and Programmes at National, State, Regional and District Levels; Planning, Development, Implementing and Monitoring Organizations and Agencies: National and State</p>	L1, L2 L3	9

<p><b>MODULE 4: Concept of Rural Development and Implementation of Regional Plans</b></p> <p>Concepts of Rural Area and Rural Development; Scope of Rural Development; Causes of Rural Backwardness; Historical Evolution of Rural Development and Rural Settlement Pattern in Indian Context; Economic Issues of Rural Development - Differentiating Economic Growth and Economic Development; Rural Jobs and Income Sources; Rural Economic Policy Infrastructure and Plan Implementation;</p> <p>Tools and Constraints in the Implementation of Plans in Terms of Administration; Schemes, Programmes, Policies for development of regions, districts, villages and cities; Selected Case Studies in Indian Context</p>	<p>L1, L2 L3</p>	<p>9</p>
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\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

- Hall, P., & Tewdwr-Jones, M. (2019). *Urban and regional planning. Urban and Regional Planning* (pp. 1–348). Taylor and Francis.  
<https://doi.org/10.4324/9781351261883>
- Scott, A. J., & Storper, M. (2003). Regions, globalization, development. *Regional Studies*, 37(6–7), 549–578. <https://doi.org/10.1080/0034340032000108697a>
- Lord, A., & Tewdwr-Jones, M. (2015). Regional Planning. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition* (pp. 129–133). Elsevier Inc. <https://doi.org/10.1016/B978-0-08-097086-8.74036-0>

### References

- Albrechts, L., Healey, P., & Kunzmann, K. R. (2003). Strategic spatial planning and regional governance in Europe. *Journal of the American Planning Association*, 69(2), 113–129. <https://doi.org/10.1080/01944360308976301>
- GoI: Ministry of Rural Development, Department of Land Resource, Desert Development Programme, New Delhi
- GoI: Planning Commission, Report on Development of Drought Prone Areas by National Committee on the Development of Backward Areas, New Delhi
- GoI: IWMP, Ministry of Rural Development, New Delhi
- GoI: Ministry of Development of North Eastern Region, New Delhi

### Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination

#### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	5	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	--	--	--	--	--	--	--	--	1	--	2	--
CO2	1	--	--	--	--	--	--	--	--	--	--	--	1	--	2	--
CO3	1	--	--	--	--	--	--	--	--	--	--	--	1	--	2	--
CO4	1	--	--	--	--	--	--	--	--	--	--	--	1	--	2	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>LAND MANAGEMENT AND REAL ESTATE (PLN4210)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Real Estate Planning and Management (B.Plan.)					
Co-requisites	Planning and Design Lab – II (Urban Planning)					

### **Catalog Description**

This course aims to introduce students to the concept of land markets and development of cities with private developers with the interests of profit, as key players in the development process. One of the prime concerns of urban development is the issue of land availability. In addition to government policies on land, market forces guide and force development on different patterns based solely on the equilibrium of demand, supply and pricing. Hence this subject becomes very important to be understood thoroughly. At the end of the course students will be able to utilise this knowledge in their urban planning studio.

### **Course Objectives**

The objective of this course is

1. To define the concept of land markets and land development in cities.
2. To cover the relationship of real estate and land market in urban areas.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Define the economic concept of land.

CO2: Relate real estate and land market and draw important insights for planning urban areas.

CO3: Explain land valuation techniques and methods.

CO4: Comprehend Real estate dynamics in India.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Economic Concept of Land</b></p> <p>Economic Concepts of Land; Objectives and Scope of Land Economics; Land Use and Land Values: Market Dynamics and Impact on Land Use Pattern; Land Use Restrictions Affecting Land Availability; Development of Land and Real Property Process - Cost of Development, Source of Finance; Economic Aspects of Land Policies at Various Levels of Decision Making; Private Ownership and Social Control of Land.</p>	L1, L2 L3	9
<p><b>MODULE 2: Real Estate and Land Market</b></p> <p>Definition of Real Estate - Physical, Financial and Social Perspectives; Comparison of Real Estate to Other Investment Avenues; Real, Local, National and Global Factors Affecting Real Estate; Real Estate as Facilitator of Development; Concepts of Real Estate Analysis - Mapping Supply to Understand Markets; Demand; Factors Affecting Real Estate Development, Demand-Supply Gap Analysis; Methods of Technical and Financial Feasibility Analysis for Different Product and Project Types.</p>	L1, L2 L3	9
<p><b>MODULE 3: Valuation of Land</b></p> <p>Valuation of Land and Property; Methods of Valuation: Comparison Method, Residual Method, Discounted Cash Flow Method; Transaction and Renting of Real Estate: Lease Deeds/ Sale Deeds, Sale Documents, Registration; Mortgage and Pledging.</p>	L1, L2 L3	9
<p><b>MODULE 4: Real Estate Dynamics in India</b></p> <p>Real Estate Dynamics, Profiling of Metropolitan Cities, Tier I, Tier II And Tier III Cities; Changing Cycles of Real Estate Development; Emerging Areas of Real Estate Development: Diversification to Logistic Hubs, Industrial Parks, Hospitality Sector, Health and Education Sector by Private Players; Introduction to Financial Models Divided cities- the concept of affordability and housing as against shelter as a basic requirement; towards inclusive cities.</p>	L1, L2 L3	9

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Luque, J. (2015). *Urban land economics. Urban Land Economics* (pp. 1–154). Springer International Publishing. <https://doi.org/10.1007/978-3-319-15320-9>
2. Rocha, K., Salles, L., Garcia, F. A. A., Sardinha, J. A., & Teixeira, J. P. (2007). Real estate and real options - A case study. *Emerging Markets Review*, 8(1), 67–79. <https://doi.org/10.1016/j.ememar.2006.09.008>
3. Shatkin, G. (2016). The real estate turn in policy and planning: Land monetization and the political economy of peri-urbanization in Asia. *Cities*, 53, 141–149. <https://doi.org/10.1016/j.cities.2015.11.015>

### Reference Books

1. Buttimer, R. J., Clark, S. P., & Ott, S. H. (2008). Land development: Risk, return and risk management. *Journal of Real Estate Finance and Economics*, 36(1), 81–102. <https://doi.org/10.1007/s11146-007-9077-z>
2. Graaskamp, J. A. (1992). Fundamentals of Real Estate Development. *Journal of Property Valuation and Investment*, 10(3), 619–639. <https://doi.org/10.1108/14635789210031253>
3. Weinstein, L. (2008). Mumbai's development mafias: Globalization, organized crime and land development. *International Journal of Urban and Regional Research*, 32(1), 22–39. <https://doi.org/10.1111/j.1468-2427.2008.00766.x>

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	--	1	--	--	--	--	--	--	--	--	1	--
CO2	1	--	--	--	--	1	--	--	--	--	--	--	--	--	1	--
CO3	1	--	--	--	--	1	--	--	--	--	--	--	--	--	1	--
CO4	1	--	--	--	--	1	--	--	--	--	--	--	--	--	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>TRANSPORTATION PLANNING AND MANAGEMENT (PLN4211)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Traffic and Transportation Planning – I & II (B.Plan.)					
Co-requisites	Planning and Design Lab – II & II					

### **Catalog Description**

The aim of this course is to introduce to the students of planning with the integration of transportation planning and its interface of land use planning. Another objective is to ensure that students have a sound understanding of the key issues affecting the planning, management and financing of public transport in developed and developing countries. At the end of the course, students will be able to analyse on transport related plans and policies.

### **Course Objectives**

The objective of this course is

1. To equip students with an integration of transportation planning and its interface of land use planning.
2. To prepare students to analyze the key issues affecting the planning, management and financing of public transport.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Define the concept of sustainable transport planning and its relevance in Indian Context

CO2: Apply transport planning process while preparing transport plans.

CO3: Calculate External Cost of Urban Transportation and plan for urban and regional freight

CO4: Utilize transport planning software.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Sustainable Transport Planning</b></p> <p>Understanding Sustainable Development and Sustainable Transport; Land-Use and Transport Planning – Key Relationships; Land Use Transport Integration Models; Transport and its Relationships with the Economy, Environment and Social Progress; Accessibility Measures, Indicators of Progress, Frameworks of Assessment, Development Control and Travel Planning.</p>	L1, L2 L3	9
<p><b>MODULE 2: Transportation Planning Process</b></p> <p>Area Delineation, Zoning (TAZ); Four Stage Planning Process: Trip Generation, Trip Distribution, Trip Assignment and Modal Split; Traffic Management- Signal design; Phasing and Time cycles; Principles of one-way system design; Pedestrianization and non-motorized transportation- Issues, policies and case studies; Towards more inclusive cities; Comprehensive Mobility Plan.</p>	L1, L2 L3	9
<p><b>MODULE 3: External Cost of Urban Transportation and Freight Transport</b></p> <p>Introduction to External Cost of Urban Transportation: Issues, Level of Service and Transport Pricing, Congestion Pricing, Policy Issues, Emission Standards and Energy Policy; National Urban Transport Policy 2006; Pricing and Revenue in Transport- Pricing; Revenue and Forecasting; Willingness to Pay.</p> <p>Introduction to Freight Transport- differences from passenger transport; location choice of transport hubs in relation to regional distribution linkages, Regional Transport Issues: Intercity Connectivity; Urban –Rural Linkages and Road Hierarchy; Road and Rail as Competing/Complementary Modes; Highway Standards in Indian Context.</p>	L1, L2 L3	9

<p><b>MODULE 4: Software Applications</b></p> <p>Software Applications: E.G. Cube 6- Network Coding, Creation of Models, Data Base and Scenarios in Cube Base, Cube Voyager Modelling Functions; Urban Land Use &amp; Transportation Planning Applications.</p>	<p>L1, L2 L3, L4</p>	<p>9</p>
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\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Curtis, C. (2008). Planning for sustainable accessibility: The implementation challenge. *Transport Policy*, 15(2), 104–112.  
<https://doi.org/10.1016/j.tranpol.2007.10.003>
2. Morris, J. M., Dumble, P. L., & Wigan, M. R. (1979). Accessibility indicators for transport planning. *Transportation Research Part A: General*, 13(2), 91–109.  
[https://doi.org/10.1016/0191-2607\(79\)90012-8](https://doi.org/10.1016/0191-2607(79)90012-8)
3. Rodrigue, J. P., Comtois, C., & Slack, B. (2016). *The geography of transport systems. The Geography of Transport Systems* (pp. 1–440). Taylor and Francis.  
<https://doi.org/10.4324/9781315618159>
4. Scott, D. M., Novak, D. C., Aultman-Hall, L., & Guo, F. (2006). Network Robustness Index: A new method for identifying critical links and evaluating the performance of transportation networks. *Journal of Transport Geography*, 14(3), 215–227.  
<https://doi.org/10.1016/j.jtrangeo.2005.10.003>

### Reference Books

1. Banister, D. (2008). The sustainable mobility paradigm. *Transport Policy*, 15(2), 73–80. <https://doi.org/10.1016/j.tranpol.2007.10.005>
2. Curtis, C., & Scheurer, J. (2017). Performance measures for public transport accessibility: Learning from international practice. *Journal of Transport and Land Use*, 10(1), 93–118. <https://doi.org/10.5198/jtlu.2016.683>
3. Lucas, K. (2012). Transport and social exclusion: Where are we now? *Transport Policy*, 20, 105–113. <https://doi.org/10.1016/j.tranpol.2012.01.013>
4. May, A. D. (2015). Encouraging good practice in the development of Sustainable Urban Mobility Plans. *Case Studies on Transport Policy*, 3(1), 3–11.  
<https://doi.org/10.1016/j.cstp.2014.09.001>
5. Parkin, J., & Koorey, G. (2012). Network planning and infrastructure design. In *Transport and Sustainability* (Vol. 1, pp. 131–160). Emerald Group Publishing Ltd.  
[https://doi.org/10.1108/S2044-9941\(2012\)0000001008](https://doi.org/10.1108/S2044-9941(2012)0000001008)

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	1	2	--	--	--	--	--	--	--	--	1	--	2	--
CO2	1	2	1	2	--	--	--	--	--	--	--	--	1	--	2	--
CO3	1	2	1	2	--	--	--	--	--	--	--	--	1	--	2	--
CO4	1	2	1	2	--	--	--	--	--	--	--	--	1	--	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>DEMOGRAPHY AND QUANTITATIVE ANALYSIS (PLN4212)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Planning Studio II <sup>nd</sup> and III <sup>rd</sup> Sem.					
Co-requisites	Statistical Data Analysis Software (Elective)					

### **Catalog Description**

The course consists of two parts of Demography and Statistics, dealing with each independently and as well as connecting the applications of statistics to demography.

**Demography:** The aim of the section on Demography is to provide the students with an understanding of basic concepts on demography. This course would make the students aware of the importance of population geography in economic development, the various theories that explain the growth of population in a country and demographic techniques applied. The course aims to help students identify appropriate sources of data, perform basic demographic analyses using various techniques and ensure their comparability across populations. The student will also be able to produce population projections and interpret the information gathered by the different demographic methods.

**Quantitative Methods:** The emphasis of the section on Statistics shall be on conceptual underpinnings of statistics with a focus on defining different statistical tools indispensable for urban planning. In view of the course according more emphasis on inferential statistics than descriptive statistics, the objective of the course will be to introduce the most useful and commonly employed statistical tools and discuss the conditions under which use of those tools is appropriate. The course has been so designed as to train the students interpret the results of an analysis to provide insight into the answer to the problem at hand. Use of SPSS is also included in the program, but will be taught separately as an elective subject in second semester itself.

### **Course Objectives**

The objective of this course is

1. To overview concepts of demography and its relation as well as utilization in planning.
2. To demonstrate various methods for quantitative/demographic data analysis.



## Course Outcomes

On completion of this course, the students will be able to

CO1: Acquire knowledge on demographic parameters used in planning.

CO2: Appreciate demographic theories, trends and impacts of migration as well as project population.

CO3: Use statistical methods of data analysis which are utilised in planning.

CO4: Apply statistical sampling techniques and advanced data analysis methods.

<b>Module</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>Module 1: Demography and Planning</b> Distribution and Density of Population - Measures of Population Distribution and Concentration; Factors Affecting Population Distribution and Density; World Population Distribution; Density Distribution in India Population Change - Fertility and Its Measures; Mortality and Its Measures; Mobility; Factors Affecting Population Change; Determinants of Fertility and Mortality.	L1, L2, L3	9
<b>Module 2: Demographic Theories, Migration, Population Composition and Projections</b> Demographic Transition Theory; Some Population Theories (Overview only); Migration - Types of Migration; Determinants of Migration; Migration Models; Population Composition - Age and Sex Composition and Its Determinants; Age Pyramids; Working Force and Its Determinants; Composition of Work Force and Occupational Composition; Population Projections – Assumptions, Methods, Techniques.	L1, L2, L3	9
<b>Module 3: Quantitative Methods-I</b> Measures of Central Tendency and Dispersion - Arithmetic Mean; Weighted Mean; Geometric and Harmonic Mean; Median and Mode; Variance and Standard Deviation; Time Series and Forecasting - Trend Analysis - Cyclical Variation, Seasonal Variation, Irregular Variation; Various Methods in Time Series Analysis – Moving	L1, L2, L3	9

Average, Ratio to Trend, Link Relative and Residual; Factor Analysis - Principal Component Analysis		
<b>Module 4: Quantitative Methods-II</b> Probability Distribution and Sampling Distribution - Use of Expected Value in Decision Making; Binomial, Poisson and Normal Distribution (only application); Determination of Sample Size and Types of Sampling; Sampling Distribution (concept only); Design of Experiments (concept only); Correlation and Regression - Two Variable versus Multiple Linear Regression; Simple and Multiple Correlation; Estimation of Parameters – The Method of Ordinary Least Squares; Hypothesis Testing, Goodness of Fit; Applications of Features of Excel for statistical analysis.	L1, L2, L3	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Burch, T. K. (2017). Fundamentals of Demographic Analysis: Concepts, Measures, and Methods. *Canadian Studies in Population*, 44(1–2), 121. <https://doi.org/10.25336/p6tw25>
2. Schabenberger, O., & Gotway, C. A. (2017). *Statistical methods for spatial data analysis. Statistical Methods for Spatial Data Analysis* (pp. 1–488). CRC Press. <https://doi.org/10.1201/9781315275086>
3. Yusuf, F., Swanson, D. A., & Martins, J. M. (2014). *Methods of demographic analysis. Methods of Demographic Analysis* (Vol. 9789400767843, pp. 1–310). Springer Netherlands. <https://doi.org/10.1007/978-94-007-6784-3>

### Reference Books

1. Chi, G., & Zhu, J. (2008, February). Spatial regression models for demographic analysis. *Population Research and Policy Review*. <https://doi.org/10.1007/s11113-007-9051-8>
2. Wachter, K. W. (2015). *Essential Demographic Methods. Essential Demographic Methods*. Harvard University Press. <https://doi.org/10.4159/9780674369757>

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	2	2	2	--	2	--	--	--	--	--	--	1	--	2	--
CO2	1	2	2	2	--	2	--	--	--	--	--	--	1	--	2	--
CO3	1	2	2	2	--	2	--	--	--	--	--	--	1	--	2	--
CO4	1	2	2	1	--	2	--	--	--	--	--	--	1	--	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING STUDIO II - URBAN (PLN4206)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	0	0	8	10
Pre-requisites/Exposure	Planning Studio I					
Co-requisites	-					

### **Catalog Description**

The studio is designed to expose the students to issues of urban planning and equip them with knowledge and techniques to enable them to analyse urban situations and develop logical decision making processes to address the complex overlays of conceptualisation, implementation and finance. The studio is designed to study one particular urban area and analyse its issues and develop spatial plans with thrust on critical sectors. It focuses on the preparation of integrated development plan for a selected urban area analysing all aspects of physical planning including socio-economic factors and physical infrastructure and also formulation of methods of implementation and projectisation. The course deliverables would be designed based on specific projects undertaken, keeping in mind the overall objective of the course.

### **Course Objectives**

The objective of this course is

1. To relate theoretical knowledge of planning with urban planning practices.
2. To conceptualize and prepare an urban development plan for the given study area.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Applying learnt planning concepts for the conceptualization and designing of an urban plan.

CO2: Present and document meaningful inferences and strategies/proposals for sustainable urban development.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<b>MODULE 1: Pre-Field visit Stage</b> Identification of an urban area; Identification and Formulation of Planning Objectives for the project; Field Visit and Survey of the study area. Data collection through primary and secondary surveys.	L3, L4 L5	40
<b>MODULE 2: Post-Field visit Stage</b> Analyses and presentation of data and information; Review of Planning Objectives post data analysis; Redefining objectives; Planning for urban area and its region (structure plan / development plan) with emphasis on: Land use, transportation networks and Infrastructure networks; Preparation of Detailed Project Report (case specific); Identification and Detailing of Action Area, Local Area plans or Project Plans (case specific); Plan Implementation strategies: Stake holder participation, project funding options; Implementation strategies including urban governance and management issue.	L3, L4 L5	80

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

#### **Essential Elements/Deliverables:**

- Defining characteristics of identified areas
- Case study and literature review of planning concepts and norms for the selected area/special area
- Formulation of Aim, Objectives and Methodology
- Selection of site and collection data (field trip of 1-week duration)
- Data analysis and presentation
- Outline framework of development – sectoral and spatial
- Implementation framework – capital investment and funding methods
- Governance and management aspects.

#### **Text Books**

1. Flood, J. (1997). Urban and housing indicators. *Urban Studies*, 34(10), 1635–1665. <https://doi.org/10.1080/0042098975385>

- De Freitas, E. L. H., & De Melo Bueno, L. M. (2018, May 1). Participatory processes for preparation of Urban Plans and Zoning: Recent experiences innovations. *Urbe*. Editora CHAMPAGNAT. <https://doi.org/10.1590/2175-3369.010.002.ao09>
- Medrano, L., & Spinelli, J. (2014). Urban policies and projects for social housing in central areas.
- Huxley, M. (2009). Planning, Urban. In *International Encyclopedia of Human Geography* (pp. 193–198). Elsevier Inc. <https://doi.org/10.1016/B978-008044910-4.01097-X>
- The case of the Habitasampa competition (São Paulo, Brazil). *Habitat International*, 42, 39–47. <https://doi.org/10.1016/j.habitatint.2013.10.004>

## References

- Allen, P. M. (2012). *Cities and regions as self-organizing systems: Models of complexity*. *Cities and Regions as Self-Organizing Systems: Models of Complexity* (pp. 1–309). Taylor and Francis. <https://doi.org/10.4324/9780203990018>
- Berghöfer, A. A., Gettkant, A., Lossack, H., Mayer, C., Prem, I., Riha, K., ... Wittmer, H. (2012). Integrating Ecosystem Services into Development Planning A stepwise approach for practitioners based on the TEEB approach. *Environment and Climate Change Department, Deutsche Gesellschaft Für Internationale*
- GOI. (2010). *The Gazette of India. DisClosure* (Vol. 2011, pp. 1–216). <https://doi.org/http://www.indianemployees.com/uploads/documents/042015/1428239209-16-92.pdf>
- Planning, S. (1996). Statewide Planning Goals & Guidelines. *Development*, 97310 (Dlcd), 1–77.

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	P -1	P -2	S	R	CE	A	ESE
Weightage (%)	50	50	60	20	15	05	200

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO2	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO3	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO4	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SPECIAL AREA PLANNING (PLN4213) (Elective)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	1	0	2	0	2
Pre-requisites/Exposure	Introduction to Regional Planning					
Co-requisites	Metropolitan Planning, Development and Management					

### **Catalog Description**

The aim of this course is to introduce the students to various Special Areas with their specific planning needs and priorities and the implication on development in these areas. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course will be on studying the need and process required for special area planning. This course will provide the students hands-on experience Special area that required a different planning process in a built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for interdisciplinary learning. The course would be conducted through literature survey, case studies, site visits, and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

1. To familiarize students with planning process required for special area in Indian context.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Appreciate the need, planning process and legislation required for special area planning

CO2: Prepare the detail report and presentation on a given project related to Special area planning.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Introduction to SAP and its Management</b>  Special Areas under consideration would include Formal and Functional Regions (Hill Areas, Coastal Areas, Desert Areas, Special Economic Zones, Port City, Aerotropolis, Medi-City, Knowledge City, TOD etc.), Types of special areas and their defining characteristics, Legislations and norms for Special Area Development in the Indian context, Capital investment and funding methods, public private partnerships in development process, Governance and Management aspects, Case Studies of various typologies of Special Area Development Plans in Indian and international context.</p>	L1, L2, L3	12
<p><b>MODULE 2: Project Work</b>  Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation*

### **Text Books**

1. Development of Hill Areas, Dobha G.L, Concept Publishing
2. Environmental Problems of Coastal Areas in India, Sharma Vinod, Bookwell
3. Integrated Development of Hill Districts in India: Issues and Approaches, Gupta, R.C., SPACE
4. Special Economic Zones In India, P. K. Manoj, Serials Publications

### **References**

1. Aerotropolis: The Way Well Live Next, John Kasarda, Allen Lane
2. Environmental act in India, Ruma Chatterjee, Oxford University Press
3. CRZ Regulations, 2011, MoEF



## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>STATISTICAL DATA ANALYSIS IN PLANNING (PLN4214) (Elective)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	1	0	2	0	2
Pre-requisites/Exposure	Demography and Quantitative Analysis					
Co-requisites	Planning and Design Lab -V & VI					

### **Catalog Description**

The aim of this course is to expose students to learn the SPSS (Statistical Package for the Social Sciences)/any other available software for statistical data analysis. The basic application of this program is to analyse statistical data related with the social sciences. Planning students rigorously work on census data, hence learning of SPSS software will enhance their data analysis skill. Furthermore, leaning SPSS will increase students chances of employability. This course is to learn the practical knowledge base on the theory and also students must be able to utilise this software for statistical data analysis in planning domain. The course would be conducted through literature survey, case studies, site visits, and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### **Course Objectives**

The objectives of this course are

1. To familiarize with the functioning of Statistical data analysis software for performing different quantitative data analysis methods on census data.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Operate SPSS/other statistical analysis software for handling census data analyse and drawing meaningful inferences.

CO2: Prepare the detail report and presentation on a given project related to available census data.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Statistical data analysis software and its applications in planning</b></p> <p>Introduction to SPSS/any other available software, Data Analysis with SPSS/other available software. General Description and Function of SPSS, SPSS file Management; Input and data cleaning, definition variable, manual input of data, Automated input of data and file import; Data Manipulation such as Data Transformation, Syntax files and scripts and Output management; Methods for statistical data analysis e.g. Correlation, Regression, Hypothesis testing; Interpretation of results and drawing meaningful inferences. Students needs to work on census data for learning the functionality of SPSS.</p>	L2, L3, L4	15
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	21

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation

### Text Books

1. Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Statistics (Vol. 58). SAGE Publications Ltd.
2. Field, A. (2005). *Discovering statistics using SPSS (2nd ed.)*. *Discovering statistics using SPSS (2nd ed.)*. Sage Publications, Inc. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2005-05622-000&site=ehost-live>
3. Introduction to SPSS. (2012). In *Statistical Methods for Practice and Research: A Guide to Data Analysis Using SPSS* (pp. 15–27). SAGE Publications India Pvt Ltd. <https://doi.org/10.4135/9788132108306.n1>

## References

1. Beddo, V. C., & Kreuter, F. (2004). A Handbook of Statistical Analyses Using SPSS . *Journal of Statistical Software*, 11(Book Review 2).  
https://doi.org/10.18637/jss.v011.b02
2. Discovering statistics using R. (2012). *Choice Reviews Online*, 50(04), 50-2114-50–2114. https://doi.org/10.5860/choice.50-2114
3. Marques De Sá, J. P. (2007). *Applied statistics using SPSS, STATISTICA, MATLAB and R. Applied Statistics Using SPSS, STATISTICA, MATLAB and R* (pp. 1–505). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-71972-4

## Mode of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>URBAN DESIGN, RENEWAL AND CONSERVATION (PLN4215) (Elective)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	1	0	2	0	2
Pre-requisites/Exposure	Introduction to Urban Design (B.Plan)					
Co-requisites	Planning and Design Lab II					

### **Catalog Description**

The aim of this course is to introduce the students to learn the urban design. It is the design of towns and cities, streets and spaces, collaborative and multi-disciplinary process of shaping the physical setting for life in cities, towns and villages, the art of making places, design in an urban context. This course is to learn the quality of urban design - creates safe, attractive and secure pathways and links between centres, landmarks and neighbourhoods, facilitates green networks that link public and private open space, places a high priority on walking, cycling and public transport. During the course the students will be able work on live projects in groups which are preferably interdisciplinary of architect, planner engineer etc.

### **Course Objectives**

The objectives of this course are

1. To assess the urban renewal/redevelopment approaches at old city and historical sites in the context of having better access to services and sustainable urban development.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Applicate the concept, challenges and solutions for Urban Design, Renewal and Conservation.

CO2: Prepare the detail report and presentation on a given project related to urban design, Renewal and Conservation.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Urban Design, Renewal and Conservation</b>  Urban History and Development Theories, Urban Design Methodologies, Digital Skills for Urban Design and Landscape, Research Methodology, Site Planning, Case Studies of Urban Design and Landscape in Indian and international context. Urban Renewal, and Conservation, Development Approaches of Old City, A brief history of the landscape concept, Principle for Conservation and Renewal of decay areas within City Area, Principles and methods for the assessment of the cultural landscape, Landscape resources, management and planning structure, Mechanism for Development of Historical Area includes the Environment, Social, Culture and Economic aspect; Infrastructure and Services Facilities System of Old Area within City. Governance System and Planning aspect to build new Plan. Case Studies.</p>	L1, L2, L3	12
<p><b>MODULE 2: Project Work</b>  Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4-Analysis; L5-Synthesis, L6-Evaluation*

### **Text Books**

1. Spiro Kostof, The City Assembled, Thames and Hudson.
2. Spiro Kostof, The City Shaped, Thames and Hudson.
3. Jon Lang, Urban Design Typology and procedures, Architectural Press
4. Lawrence W.C. Lai., Frank T. Lorne. Sustainable Urban Renewal and Built Heritage
5. Conservation in a Global Real Estate Revolution, Sustainability., 11 (580), 2019

### **References**

1. A.E.J. Morris, History of Urban Form, Longman Scientific and Technical.

2. Kevin Lynch, Good City Form, MIT Press. Edmund Bacon, Design of Cities.
3. Geoffrey Broadbent, Emerging Concepts of urban Design

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus – Third Semester

	<b>PROJECT PLANNING AND FINANCE MANAGEMENT (PLN4302)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Project Formulation, Appraisal and Management (B.Plan.)					
Co-requisites	Urban Finance (B.Plan.)					

### **Catalog Description**

The aim of the course on Project Planning and Financial Management is to train the students in managing a project right from its conception to evaluation. The organisation of the course has been so designed that it graduates from concept to application on all aspects of project management. Besides, this course also exposes the students to the various concepts, mechanism and role of development finance and its relevance with various hierarchy of government system.

### **Course Objectives**

The objective of this course is

1. To assess skillset of conceptualizing and managing projects related to planning.
2. To grasp development and channelization mechanism of financial and other resources for planning projects and schemes.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Apply Project Planning and Project appraisal techniques.

CO2: Utilise Project formulation and evaluation techniques.

CO3: Comprehend Financial Management, Resources mobilisation and Municipal Finance with reference to planning projects.

CO4: Explain concept of Investment Planning and Financing Mechanism.



Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Project Planning and Appraisal</b></p> <p>Introduction to Project and Project Management; Importance of Project Management; Stages of Project Life Cycle; Causes of Project Delay; Behavioural Aspects of Project Management; Role of Project Manager; Attributes of a Successful Project Manager; Introduction to Project Planning; Process of Project Planning; Project Planning during Investment Phase; Planning for Project Work (Work Breakdown Structure); Planning for Manpower and Organisation; Planning for Project Finance; Planning for Information System; Introduction to Project Appraisal; Types of Feasibility; Financial and Economic Appraisals; Ascertaining Project Costs and Benefits; Project Financial Appraisal Techniques – Payback Period, Benefit Cost Ratio, Net Present Value, Internal Rate of Return; Components of a Feasibility Study; Social Cost Benefit Analysis.</p>	L1, L2 L3	9
<p><b>MODULE 2: Project Formulation and Evaluation</b></p> <p>Process of Project Formulation; Constraints in Project Formulation; Breakeven Analysis; Sensitivity Analysis; Project Budgeting and Performance Budgeting; Definition of Project Scheduling; Steps in Project Scheduling; Network Techniques in Project Scheduling; Activity on Arc/Node; Forward Pass and Backward Pass; Critical Path and Slack; CPM Simulation; PERT (Concept only); Gantt Chart (Concept only); Definition of Project Monitoring; Criteria for Decision Making; Parameters and Tools of Control; Use of Network Analysis in Project Monitoring; Analysis of Cost and Time; Reporting and Corrective Actions; Resource Management – Resource Loading and Resource Levelling; Project Reporting; Types of Project Evaluation; Tools of Project Evaluation; Time Frame in Evaluation; Project Cash Flows – Elements of Cash Flow Stream; Principles of Cash Flow Estimation; Project Benefits; Sources of Funds – Disposition of Funds; Financial Closure</p>	L1, L2 L3	9

<p><b>MODULE 3: Financial Management, Resources and Municipal Finance</b></p> <p>Concept of development of finance; Approaches; Development administration at National, State and Local Level and the process of Formulation; Financial Institutions: concept, typology and their role; Structure of finances; Fiscal Problems and issues of financial management; Implementation of 74<sup>th</sup> Amendment for Municipal Finance, expenditure Pattern, mobilising resources for a project – financial resources, land resources, project resources etc.; Finance Commissions, Fiscal agenda of development schemes and Sources of revenues; equities; loans; debt financing; Pooled finance development fund, national urban infrastructure fund; municipal bonds and miscellaneous sources.</p>	L1, L2 L3	9
<p><b>MODULE 4: Investment Planning and Financing Mechanism</b></p> <p>Links with Spatial Plans, Process, Components, Investment needs, Budgeting; Financial investments in infrastructure and services; Financing of Urban and Regional Development, infrastructure and services – Mechanism and Instruments, Subsidy reduction, cost recovery, Public Private Partnership (PPP), Micro Finance, Financial Appraisal, Investment Appraisal; Financial Risks- Sources, measures and perspectives on risk, Sensitivity Analysis, Property Tax Administration, Rent Control System.</p>	L1, L2 L3	9

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Botter, C. H. (1982). Project management: A systems approach to planning, scheduling and controlling. *European Journal of Operational Research*, 10(2), 211. [https://doi.org/10.1016/0377-2217\(82\)90164-3](https://doi.org/10.1016/0377-2217(82)90164-3)
2. Lester, A. (2007). *Project Management, Planning and Control*. Project Management, Planning and Control. Elsevier Ltd. <https://doi.org/10.1016/B978-0-7506-6956-6.X5000-X>
3. Phillips, J. J., Brantley, W., & Phillips, P. P. (2011). The Project Management Lifecycle. In *Project Management ROI* (pp. 15–30). John Wiley & Sons, Inc. <https://doi.org/10.1002/9781118122587.ch2>

- Slack, E. (2009). *Guide to Municipal Finance*. (X. Quan Zhang, E. Orina, & C. Ng, Eds.), *Human Settlements Finance Tools and Best Practices* (pp. 1–90). Nairobi: UN Habitat. Retrieved from [http://www.citiesalliance.org/sites/citiesalliance.org/files/UNH\\_Guide\\_Municipal\\_Finance.pdf](http://www.citiesalliance.org/sites/citiesalliance.org/files/UNH_Guide_Municipal_Finance.pdf)

## References

- Agudelo-Vera, C. M., Mels, A. R., Keesman, K. J., & Rijnaarts, H. H. M. (2011, October). Resource management as a key factor for sustainable urban planning. *Journal of Environmental Management*. <https://doi.org/10.1016/j.jenvman.2011.05.016>
- Papke-Shields, K. E., & Boyer-Wright, K. M. (2017). Strategic planning characteristics applied to project management. *International Journal of Project Management*, 35(2), 169–179. <https://doi.org/10.1016/j.ijproman.2016.10.015>
- Wellman, K., & Spiller, M. (2012). *Urban Infrastructure: Finance and Management*. *Urban Infrastructure: Finance and Management* (pp. 1–305). Wiley-Blackwell. <https://doi.org/10.1002/9781118401637>

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	--	--	--	1	--	1	1	1	2	1	1	--	--	--	--
CO2	1	--	--	--	1	--	1	1	1	2	1	1	--	--	--	--
CO3	1	1	--	--	1	2	1	1	1	2	1	1	--	--	--	--
CO4	1	1	--	--	1	1	1	1	1	2	1	1	--	--	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PUBLIC POLICY IN PLANNING (PLN4304)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Urban Governance, Planning Practice I & II (B.Plan.)					
Co-requisites	Planning and Design Lab – II & III					

### **Catalog Description**

This course aims to provide an in-depth study of the various approaches for policy formulation, implementation and evaluation. It addresses issues in policy analysis, and explains the forces that influence the functioning of executive, legislature, judiciary, civil society, NGOs and administration. It will also cover a critical analysis of policies that are directly connected with inclusive sustainable urban development.

### **Course Objectives**

The objective of this course is

1. To observe and compare various approaches for policy formulation, implementation and evaluation.
2. To cover critical analysis of policies relating to inclusive and sustainable urban development.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Define Policy concept and significance in planning.

CO2: Use Policy Monitoring and evaluation techniques.

CO3: Explain Policy making and implementation techniques.

CO4: Compare between different case studies of Policy implementation and monitoring.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Policy Analysis: Nature and Significance</b></p> <p>Policy Analysis: Nature, Scope, Significance and Contextual Perspectives; Policy Making Approaches and Models: Power Approaches to Policy-Making, Institutional Approaches to Policy Analysis, Strategic Planning Approach for Improving Public Policy, Rational Approach and Simon’s Rationality Model; Decision-Making Process and Techniques</p>	L1, L2 L3	9
<p><b>MODULE 2: Policy Monitoring and Evaluation</b></p> <p>Policy Monitoring: Approaches and Techniques; Policy Evaluation: Techniques and Approaches; Policy Evaluation: Role, Process and Criteria; Policy Performance: Evaluating Impact.</p>	L1, L2 L3	9
<p><b>MODULE 3: Policy Making and Implementation</b></p> <p>Policy-Making Techniques: Structure of Power and Public Policy-Making Process; Power and Role of Non-Officials in Policy-Making; Policy-Making Power within the Executive; Intergovernmental Relations and Public Policy Issues Public Policy Implementation: Approaches and Models; Inter-Organizational Relations and Public Policy Implementation; Public Policy Delivery Agencies and Implementers; Public Policy Implementation: Gaps and Problems.</p>	L1, L2 L3	9
<p><b>MODULE 4: Case Studies</b></p> <p>International Agencies and Globalization of Policy Agendas Critical Analysis of Making, Implementation and Monitoring of following Policies:- National Urban Sanitation Policy, National Urban Housing &amp; Habitat Policy 2007 National Policy for Urban Street Vendors-2009, National Environmental Policy 2006 National Urban Transport Policy 2006, National Water Policy 2002 and 2012 (draft) Policy on Energy.</p>	L1, L2 L3	9

*\*Bloom’s Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

## Text Books

1. Urban Policy in Practice, Tim Blackman, Publisher: Routledge
2. Public Policy: Art and Craft of Policy Analysis, R. K. Saprú, PHI Learning Pvt. Ltd- New Delhi
3. Public Policy Analysis, William N. Dunn, Pearson Education
4. Public Policy, Analysis and Design, VK Agnihotri, Concept Publishing
5. Approaching Public Policy Analysis: An Introduction to Policy and Programme Research,
6. Kent E. Portney, Prentice Hall- Gale

## Reference Books

1. <http://urbanindia.nic.in/policies/TransportPolicy.pdf>
2. <http://envfor.nic.in/nep/nep2006.html>
3. <http://urbanindia.nic.in/programme/uwss/NUSP.pdf>
4. [http://mhupa.gov.in/w\\_new/sug\\_npustv.pdf](http://mhupa.gov.in/w_new/sug_npustv.pdf)
5. <http://wrmin.nic.in/writereaddata/linkimages/nwp20025617515534.pdf>
6. [http://mowr.gov.in/writereaddata/linkimages/DraftNWP2012\\_English9353289094.pdf](http://mowr.gov.in/writereaddata/linkimages/DraftNWP2012_English9353289094.pdf)

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	2	2	1	1	1	1	2	1	1	1	2	2	--
CO2	1	1	1	2	2	1	1	1	1	2	1	1	1	2	2	--
CO3	1	1	1	2	2	1	1	1	1	2	1	1	1	2	2	--
CO4	1	1	1	2	2	1	1	1	1	2	1	1	1	2	2	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>RESILIENCE AND PLANNING (PLN4308)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Ecology, Environment and Resource Development and Management (B.Plan.)					
Co-requisites	Planning and Design Lab – II & III					

### **Catalog Description**

This course aims at developing a systematic understanding for identifying, assessing and reducing the risks of disaster. It helps in assessing physical, socio-economic and environmental vulnerabilities and mitigation mechanisms for various types of disasters and making out settlements more resilient. The course also aims at giving a general understanding of climate change and strategies for mitigating the effects of climate change.

### **Course Objectives**

The objective of this course is

1. To understand the basic concepts of disaster management.
2. To appreciate disaster management mechanisms; disaster risk mitigation; and post disaster measures
3. To explain the fundamentals of climate change science.
4. To present the international climate change legal and policy framework and explain key issues under negotiation.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Explain the concepts, prevention strategies and post disaster management for various types of disasters.

CO2: Describe the role of government authorities and others organizations in disaster management

CO3: Explain the basic concepts of climate change science and analyse different climate change scenarios and their implications

CO4: Incorporate the importance and mechanisms of adaptation in preparing for and coping with climate change

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Basic Concepts of Disaster Management</b></p> <p>Disaster –related terms, definitions, concepts; Types and classifications of disasters- causes and consequences; Overview of disasters across the world; Disaster management cycle, Phases of disasters; Disaster Vulnerability: physical vulnerability, socio-economic vulnerability, environmental vulnerability; Disaster Risk Mapping; Emergency phase of disasters; Disaster Rescue and Relief; Post disaster recovery and rebuilding process</p>	L1, L2 L3	9
<p><b>MODULE 2: Disaster Management Mechanisms</b></p> <p>Recent initiatives at national and state level; Kyoto Framework of disaster mitigation and management; Disaster Management Act – national and states; Roles and Responsibilities of National Disaster Management Authority, State Disaster Management Authorities, District Disaster Management Authorities; Various role players in disaster management – NGOs / CBOs and Armed Forces; Community Based Disaster Preparedness (CBDP); Physical planning and disaster management plans; Applications of Remote sensing and GIS in disaster management.</p>	L1, L2 L3	9
<p><b>MODULE 3: Introduction to Climate Change</b></p> <p>Basics of climate change science; Concepts of climate and weather, greenhouse gas; Impact of climate change on surface temperature, precipitation, ocean pH, sea-level; Energy and climate change; Water and climate change; Soil and climate change; Landscape and climate change</p>	L1, L2 L3	9
<p><b>MODULE 4: Climate Change Adaptations</b></p> <p>Introduction to the concept of climate change adaptation; Assessing climate vulnerability; Introduction to linkages between climate change adaptation and development; Important international adaptation initiatives and programmes; International climate change negotiations; The 4 United Nations Framework Convention on Climate Change (UNFCCC); The Kyoto Protocol and its associated bodies</p>	L1, L2 L3	9



*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

1. Christian N. Madu, (2017). *Handbook of Disaster Risk Reduction & Management: Climate Change And Natural Disasters*
2. Damon P Capolla, (2007). *Introduction to international Disaster Management: Butterworth Heinemann*
3. Klijn, F.(2012).*Comprehensive Flood Risk Management: Research for Policy and Practice*
4. Wisner, B., Blaikie, P. M., Cannon, T., Davis, I. (2004) 'At Risk: Natural Hazards, People's Vulnerability and Disasters' Psychology Press, ISBN 0415252164, 9780415252164

### **References**

1. Blakie, P., Cannon, T., Davis, I. and Wisner, B. (1994), 'At Risk: Natural Hazards, People's Vulnerability and Disasters', Routledge, London
2. Cannon, T. (2000). Vulnerability Analysis in Disasters. In: D. Parker, ed., *Floods*, pp. 43-55. London
3. Coburn, A. and Spence, R., (2002) 'Earthquake Protection', John Wiley & Sons, Ltd, England
4. Dowrick, D. (2003) 'Earthquake Risk Reduction', John Wiley & Sons, Ltd, England.
5. George D Haddow and Jane A Bullock, (2006). *Introduction to Emergency Management: Elsevier Butterworth Heinemann*
5. IISD, UNITAR & UNEP (2009). IEA Training Material: Vulnerability and Climate Change Impact Assessment for Adaptation.
6. NDMA, (2007-11). *Disaster Management Guidelines: New Delhi*
7. UNDP (2004) 'Reducing Disaster Risk: A Challenge for Development' United Nations Development Programme, ISBN 92-1-126160-0 Available: [http://www.undp.org/cpr/whats\\_new/rdr\\_english.pdf](http://www.undp.org/cpr/whats_new/rdr_english.pdf)
8. UNEP & UNDP (2011). *Mainstreaming Climate Change Adaptation into Development Planning: A Guide for Practitioners*

**Modes of Evaluation: Quiz/Assignment/ Seminar/Written Examination****Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	5	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--
CO4	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>URBAN AND REGIONAL GOVERNANCE (PLN4309)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Urban Governance (B.Plan.)					
Co-requisites	Planning Studio II & III					

### **Catalog Description**

The aim of this course is to discuss the evolution of governance arrangements, in the context of urbanization trends in India; producing equitable, inclusive and sustainable urban environments. Emphasis is on comprehending Indian constitutional foundation of urban bodies as democratic institutions, and not merely as providers of urban services within the prevailing institutional dimension of urban Politics. At the end of the course students will be able to utilise governance and institutional mechanism for giving proposals for the effective plan execution. The course will be delivered through theoretical inputs, class discussions and seminar presentations by students on selected topics.

### **Course Objectives**

The objective of this course is

1. To assess available urban and regional governance mechanism
2. To observe national and international e-governance experiences in rural and urban areas.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Compare government and governance mechanism.

CO2: Appraise national and local government framework.

CO3: Comprehend Urban and Regional perspectives of governance system

CO4: Utilize concept of municipal governance, public participation and e-governance prospects in plan/policy implementations.

<b>Modules</b>	<b>Blooms level*</b>	<b>Number of hours</b>
<p><b>MODULE 1: Government versus Governance</b></p> <p>Definitions, concepts and types-Indian government-Administration and Political boundaries of India- Democracy and Government, Electoral system and formation of government in India and abroad.</p>	L2, L3 L4	9
<p><b>MODULE 2: National and Local Government</b></p> <p>Central-State-Local government relations and Controls; Pre-independence and post-independence government system in India; Theories and methods of Administration system; 74<sup>th</sup> CAA Government of India-Municipal Acts and structure of Local government; Municipal election governance system- City Mayor and Commissioner elections.</p>	L2, L3 L4	9
<p><b>MODULE 3: Governance: Urban and Regional Perspectives</b></p> <p>Urban government and urban system; Administration set-up; Institutional arrangement of urban local government; Urban development management and UN habitat initiatives; Municipal Infrastructure development and service delivery system- water, health, sanitation, security and poverty reduction; Urban disaster preparedness and management; Panchayati Raj, Governance at rural levels.</p>	L2, L3 L4	9
<p><b>MODULE 4: Municipal Governance, Public Participation and e-Governance</b></p> <p>Evolution of centralised versus decentralisation of governments; Government Reforms, Lessons from JNNURM; Demography and participating demography, participatory governance, Role of people in government decision making process. Network Governance and Multi-stakeholders Governance; information communication system and local government; National and international experiences of e-governance; e-Readiness of local government; e-governance for smart cities in India and abroad.</p>	L2, L3 L4	9

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Biswas, R., Jana, A., Arya, K., & Ramamritham, K. (2019). A good-governance framework for urban management. *Journal of Urban Management*, 8(2), 225–236. <https://doi.org/10.1016/j.jum.2018.12.009>
2. Feiock, R. C. (2007). Rational choice and regional governance. *Journal of Urban Affairs*, 29(1), 47–63. <https://doi.org/10.1111/j.1467-9906.2007.00322.x>
3. Healey, P. (2006). *Urban complexity and spatial strategies: Towards a relational planning for our times. Urban Complexity and Spatial Strategies: Towards a Relational Planning for Our Times* (pp. 1–328). Routledge Taylor & Francis Group. <https://doi.org/10.4324/9780203099414>

### References

1. Armitage, D. (2007). Governance and the Commons in a Multi-Level World. *International Journal of the Commons*, 2(1), 7. <https://doi.org/10.18352/ijc.28>
2. Harpham, T., & Boateng, K. A. (1997). Urban governance in relation to the operation of urban services in developing countries. *Habitat International*, 21(1), 65–77. [https://doi.org/10.1016/S0197-3975\(96\)00046-X](https://doi.org/10.1016/S0197-3975(96)00046-X)
3. Evans-Cowley, J., & Conroy, M. M. (2004). E-Government. *APA Planning Advisory Service Reports*, (525), 1–41. <https://doi.org/10.4018/jdsst.2010100101>

### Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

#### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

#### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO2	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO3	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--
CO4	1	1	--	--	--	--	--	--	--	--	--	--	1	1	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>RESEARCH METHODOLOGY AND THESIS PLANNING (PLN4310)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	1	0	0	2	2
Pre-requisites/Exposure	Technical Report Writing and Research Methodology (B.Plan.)					
Co-requisites	Planning Thesis					

### **Catalog Description**

The aim of this course is to introduce students to literature review, research processes, techniques and colloquial arguments, so as to help them finalise a topic for their thesis in the subsequent semester. Two seminars would be conducted in the course of the semester to initiate the process of literature review related to student areas of interest culminating in selection of an appropriate thesis topic. Students will also be taught reference management software-Mendeley as a part of this course.

### **Course Objectives**

The objective of this course is

1. To equip students with good research qualities and ethics.
2. To prepare students to plan their thesis in an effective manner well in advance.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Absorb basic qualities and requirement of a good research.

CO2: Use research communication Techniques.

CO3: Develop their thesis with a good research design.

CO4: Present two seminars based on the proposed research conceptual plan.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction to Research and Research Ethics</b></p> <p>Definition of Research, types, Basics of academic and applied research; Different Approaches to research; Elements of research: epistemology, theoretical perspective, methods, methodology; Justification of Choice and use of Methods and Methodology; Paradigms in Research. Knowledge on act of plagiarism; Prior permission and intimation form the source; Time management in research; Conduct of interview, asking right question, confidentiality, elimination of researcher biases; Role and Responsibility of Researcher.</p>	L1, L2 L3	6
<p><b>MODULE 2: Research Communication</b></p> <p>Research vocabulary, Reading- notes taking, material organisation, indexing; Technical Writing- Content synthesising, paraphrasing, citation and referencing; APA referencing system, Use of Mendeley in Reference Management; Academic writing- Research Proposal, Synopsis, Abstract writing, Report Writing and mapping; Presentation: effective content structuring, oral communication, voice modulation, body language, audio-visual aids, handouts.</p>	L1, L2 L3	6
<p><b>MODULE 3: Developing Thesis</b></p> <ul style="list-style-type: none"> <li>• Identification of topic of interest having relevance to planning profession, integration and application of the learnt research processes to the pre-thesis work</li> <li>• Book reviews and journal article compilation to establish the body of work existing in the selected area of work</li> <li>• Collection of data and opinions by the stakeholders, decision makers, urban managers, advocates, technocrats, user groups, etc. on the topic selected.</li> <li>• Based on the literature review and inputs from the colloquial arguments, the topics shall be finalised for thesis in the subsequent semester.</li> </ul>	L3, L4 L5	12

<ul style="list-style-type: none"> <li>• Selection of study area, identification of extent and spread of intervention; collection of data for preparation of base map.</li> <li>• Development of research thrust and work methodology. Identification of data sources.</li> <li>• Data collection and analysis: sample determination, data tabulation (coding, de-coding, etc.), quantitative and qualitative data analysis. Appropriate and relevant data analysis methods would need to be studied by individual students based on thesis topic and research area.</li> </ul>		
<p><b>MODULE 4: Professional Practice</b></p> <p>Finalisation of topic; formulation of problem statement, literature review, working hypothesis, research brief, research methodology, sample determination, data collection and analysis, report structuring.</p> <p>The student will be required to make two seminar presentations and submit a report at the end of the semester which will qualify as the literature review and research methodology component of his/her thesis in the forthcoming semester.</p>	L3, L4 L5	12

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

1. Condry, R. (2004). Writing Your Thesis. *The British Journal of Sociology*, 55(4), 597–598. [https://doi.org/10.1111/j.1468-4446.2004.00040\\_9.x](https://doi.org/10.1111/j.1468-4446.2004.00040_9.x)
2. Shanti Bhushan Mishra and Shashi Alok., (2017): Hand Book of Research Methodology, Gate Research
3. Taylor, G. (2009). *A Student's Writing Guide: How to Plan and Write Successful Essays. Social Sciences* (p. 266). Retrieved from <http://www.cambridge.org/9780521729796>
4. Wentz, E. A. (2017). *How to Design, Write, and Present a Successful Dissertation Proposal. How to Design, Write, and Present a Successful Dissertation Proposal.* SAGE Publications, Ltd. <https://doi.org/10.4135/9781506374710>

### **Reference Books**

1. American Psychological Association. (2010). *APA Sixth Edition. Intellectual Property* (Vol. 1968, p. 272). <https://doi.org/10.1006/mgme.2001.3260>



2. Chinelo Lgwenagu, (2016): Fundamental of Research Method and data collection, British Council, Research Gate
3. Jennifer Mason, (2002): Qualitative Researching, 2nd edition, SAGE Publications, London
4. Neville, C. (2007). The complete guide to referencing and avoiding plagiarism. *Open University Press*, 27–41. <https://doi.org/10.1016/B978-0-08-100072-4.00007-1>

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	-	10	70	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO2	1	2	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO3	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--
CO4	1	1	1	1	--	--	2	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING STUDIO-III - REGIONAL (PLN4307)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	0	0	8	10
Pre-requisites/Exposure	Planning Studio I & II					
Co-requisites	-					

### **Catalog Description**

The course aims to understand the theoretical basis for various concepts and analytical tools of Regional Planning and learn the practice of regional planning in the Indian context. Elements of settlement system in the regional context are also incorporated in this course. The course provides an in-depth understanding of the issues of regional development, regional disparity and the need for balanced regional development in the context of globalization and rapid economic transformations in the country. Regional policies and sectoral policies are also discussed. Metropolitan regions, districts as planning regions and rural planning issues are discussed in the wider spectrum of holistic regional planning and development. Students will be able to apply the knowledge gained through theoretical subjects in their studio planning.

### **Course Objectives**

The objective of this course is

1. To relate theoretical knowledge of planning with regional planning practices.
2. To conceptualize and prepare regional development plan for the given study area.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Applying learnt planning concepts for the conceptualization and designing of a regional plan.

CO2: Present and document meaningful inferences and strategies/proposals for sustainable regional development.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Concept of Regional Planning</b></p> <ul style="list-style-type: none"> <li>• Concept of Region: Region Types and Regionalization; Concept of Regional Planning: Nature, Objectives, Levels and Aims</li> <li>• Elements of Settlement System: Function, Spacing, Linkage, Settlement Pattern and Factors Responsible Thereof; Potentials and Centrality of Settlements</li> <li>• Regional Inequalities – Growth, Density and Spatial Inequalities of Population Distribution, Spatial Patterns and Characteristics of Occupational Types; Regional Planning Policies and Its Relevance</li> <li>• Introduction to Economic and Regional Growth Processes: Some Approaches of Rostow, Hirschman, Myrdal, Friedman, Haggerstand; Concept of Growth Centres, Growth Pole, Service Centre and Agro-Politan District and their Application in India</li> <li>• Regional Development Strategies: Centralized and Decentralized; Regional Planning Process: Location of New Regional Economic Activities; Tools and Techniques of Regional Analysis</li> <li>• Metropolitan Regions: Concept of Degree of Primacy, Area of Influence, Service Area; City Regions and Delineation Techniques; Centralization and Decentralization Processes</li> <li>• Concepts of Ring and Satellite Towns, Counter-Magnets; Forms and Concepts for Metropolitan Planning and Development</li> </ul>	L2, L3 L4	40
<p><b>MODULE 2: Governance Mechanism and Implementation</b></p> <ul style="list-style-type: none"> <li>• District Planning Process: Identification of Plan Objectives; Collection, Classification and Analysis of Data; Norms and Standards for District Planning; Components of District Planning in the Context of 73rd CAA, 1992, Planning Process Under District Planning.</li> <li>• Committee, Metropolitan Planning Committee; Plan Implementation: Five Year Plans and Rural Development; Planning Process, Policies and Programmes at National, State, Regional and District Levels; Planning, Development, Implementing and Monitoring Organizations and Agencies: National and State.</li> <li>• Concepts of Rural Area and Rural Development; Scope of Rural Development; Causes of Rural Backwardness; Historical Evolution of Rural Development and Rural Settlement Pattern in Indian Context; Economic Issues of Rural Development - Differentiating</li> </ul>	L2, L3 L4	80

<p>Economic Growth and Economic Development; Rural Jobs and Income Sources; Rural Economic Policy.</p> <ul style="list-style-type: none"> <li>• Infrastructure and Plan Implementation; Tools and Constraints in the Implementation of Plans in Terms of Administration; Schemes, Programmes, Policies for development of regions, districts, villages and cities; Selected Case Studies in Indian Context.</li> </ul>		
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*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Essential Elements/Deliverables:**

- Defining characteristics of identified areas
- Case study and literature review of planning concepts and norms for the selected area/special area
- Formulation of Aim, Objectives and Methodology
- Selection of site and collection data (field trip of 1 week duration)
- Data analysis and presentation
- Outline framework of development – sectoral and spatial
- Implementation framework – capital investment and funding methods
- Governance and management aspects.

### **Text Books**

1. Berghöfer, A. A., Gettkant, A., Lossack, H., Mayer, C., Prem, I., Riha, K., ... Wittmer, H. (2012). Integrating Ecosystem Services into Development Planning A stepwise approach for practitioners based on the TEEB approach. *Environment and Climate Change Department, Deutsche Gesellschaft Für Internationale Zusammenarbeit (GIZ) GmbH Registered. Bonn and Eschborn, Germany*, 82.
2. Haughton, G., & Counsell, D. (2004). Regions and sustainable development: Regional planning matters. *Geographical Journal*, 170(2), 135–145.  
<https://doi.org/10.1111/j.0016-7398.2004.00115.x>
3. Seo, J. K. (2009). Balanced national development strategies: The construction of Innovation Cities in Korea. *Land Use Policy*, 26(3), 649–661.  
<https://doi.org/10.1016/j.landusepol.2008.08.014>
4. Zarenda. (2013). South Africa's National Development Plan and its implications for regional development. *Tralac Working Paper No.D13WP01/2013*, (June), 1–17.  
<https://doi.org/10.1093/jb/mvp206>

## References

1. Allen, P. M. (2012). *Cities and regions as self-organizing systems: Models of complexity. Cities and Regions as Self-Organizing Systems: Models of Complexity* (pp. 1–309). Taylor and Francis. <https://doi.org/10.4324/9780203990018>
2. McGee, G., Cullen, A., & Gunton, T. (2010). A new model for sustainable development: A case study of The Great Bear Rainforest regional plan. *Environment, Development and Sustainability*, 12(5), 745–762. <https://doi.org/10.1007/s10668-009-9222-3>
3. GOI. (2010). *The Gazette of India. DisClosure* (Vol. 2011, pp. 1–216). <https://doi.org/http://www.indianemployees.com/uploads/documents/042015/1428239209-16-92.pdf>

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	P -1	P -2	S	R	CE	A	ESE
Weightage (%)	50	50	60	20	15	05	200

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO2	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO3	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--
CO4	1	1	1	2	1	1	1	1	1	1	1	1	--	1	1	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>SETTLEMENT ANTHROPOLOGY AND INCLUSIVE DEVELOPMENT (PLN4311) (ELECTIVE)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	1	0	2	0	2
Pre-requisites/Exposure	Development, Management and Finance, Infrastructure Planning					
Co-requisites	Public Policy in Planning, Urban Finance					

### **Catalog Description**

The aim of this course is to offer opportunities in specialized or advance learning in anthropological aspects which are of concern to physical planning. The courses will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The focus of the course will be on studying social aspects of human settlements and empowering marginalised sections of the population by improving the institutions of social structure. The course will provide the students hands-on experience of cultural, sociological and psychological studies of the built environment. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for interdisciplinary learning. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

1. To expose the students to various techniques and decisive strategies that brings inclusivity and equality in the Plan.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Apply various determinants of anthropology and elements of inclusive development by reviewing and conducting different case studies.

CO2: Prepare the detail report and presentation on a given project related to inclusive planning.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Settlement Anthropology and Inclusive Development</b>            Basic introduction to various critical social aspects; Role of anthropology in settlement planning; Determinants of sociology- social structure, social status, social control, social institutions, social mobility; Vulnerable and Marginalized groups in society; Elements of inclusive growth; Challenges in achieving inclusive growth; Methods to measure inclusive growth; Indicators of inclusive development; Various case studies related to gender inequality and development planning, community development- community response towards development strategy etc.; Strategies for involving people in development planning process and thereafter in policy/program/plan/scheme implementation.</p>	L1, L2, L3	12
<p><b>MODULE 2: Project Work</b>            Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

1. Cragun R.T.(2006). Introduction to Sociology, Wikibooks.
2. Oomen T.K. and Venugopal C.N. (2004), Sociology, Eastern Book Company.
3. Steve Barkan (2010), Sociology: Understanding and Changing the Social World, Flat World Reference Books

### **References**

1. Sinha A. (2013) "An India for Everyone: A Path of Inclusive Development, Harpercollins

2. Tejchman A. (2016) “The Politics of Inclusive Development”, Palgrave Macmillan.

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related



	<b>SMART CITIES AND ADVANCED TECHNOLOGIES FOR EMERGING PLANNING ISSUES (PLN4312) (ELECTIVE)</b>	L	T	P	S	C
Version 1.1		1	0	2	0	2
Pre-requisites/Exposure	Development, Management and Finance, Infrastructure Planning					
Co-requisites	Public Policy in Planning, Urban Finance					

### **Catalog Description**

The aim of this course is to introduce the students to smart cities concepts and solutions with their specific planning needs and priorities and the implication on development in these areas. Besides, this course also offers opportunities in specialized or advance learning in emerging spatial planning issues and planners need to give special attention to them while preparing the plans. The course will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The course will provide the students hands-on experience of infrastructural, environmental problems emerging in a city. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for interdisciplinary learning. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

1. To grasp Smart city concept as well as understanding emerging challenges in a city/region and finding out ways to resolve them.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Apply smart city planning as well as critically analyze emerging multifaceted planning issues and technology-based solution to address them.

CO2: Prepare the detail report and presentation on a given project with an emphasis on smart solutions in order to achieve the goal of sustainable development.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Smart Cities, Advance Technologies and Emerging Planning Issues</b></p> <p>Introduction to smart cities, the city as a system of systems, smart citizens, Infrastructure, technology and data, Innovation and enterprise, smart leadership and strategy, standards and capacity building, smart measurement, and learning. Case Studies of various smart cities in Indian and international context.</p> <p>Challenges and problems faced by Mega city and its region, Issues- rapid unplanned growth, urban sprawl, infrastructure related issues such as shortage of Water Supply, Public transport, Parking Issue, Shortage of housing, Solid waste management, environmental issues such as deforestation, land conversion, depletion of ground water etc.</p> <p>Advanced Solution- Advanced Transport Planning system, Smart Mobility, Application technology for improving agriculture productivity, Rain water harvesting, green roofs Sustainable housing affordability, Zero-carbon city, Use of Information and Communication Technology in Planning and Governance- E-Governance, E-Planning, Case studies covering various planning issues at different level of Planning</p>	L1, L2, L3	12
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study; Formulation of Aim and Objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

*\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

## Text Books

1. Dash, R. Environmental Sustainability Index for Indian States 2009 Informing Environmental Action. Chenna: Centre for Development Finance, Institute for Financial Management and Research.
2. GRIHA. (2010). National Rating System, 'GRIHA' Green Rating for Integrated Habitat Assessment, An evaluation tool to help design, build, operate and maintain a resource-efficient built environment, GRIHA manual Volume 1. TERI Press, New Delhi: Ministry of New and Renewable, Energy, Government of India and The Energy and Resources Institute.
3. Girardet, H. \_1990.. The metabolism of cities. In: Cadman, D.and Payne, G. \_eds. \_1990.. The Living City: Towards a Sustainable Future London: Routledge.
4. Smart Cities Unbundled, Sameer Sharma, Bloomsbury India
5. The Smart City Transformations: The Revolution of The 21st Century, Amitabh Satyam, Bloomsbury India

## References

1. Basiago, A. D. \_1996.. The search for the sustainable city in20th century urban planning. The Environmentalist, 16
2. Douglas, I. Urban ecology and urban ecosystems: understanding the links to human health and well-being.Curr. Opine. Environ. Sustain. 2012, 4, 385–392.
3. Smart Technologies, K. Worden, World Scientific Publishing Co Pte Ltd
4. Smart Technologies for Smart Governments, Manuel Pedro Rodríguez Bolívar, Springer Publications

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	1	2	--	--	--	--	--	--	--	--	--	1	2	--	--

1: strongly related, 2: moderately related and 3: weakly related

	<b>ENVIRONMENTAL IMPACT ASSESSMENT (PLN4313) (ELECTIVE)</b>	L	T	P	S	C
Version 1.1		1	0	2	0	2
Pre-requisites/Exposure	Land Economics and Real Estate Planning Disaster Risk Mitigation and Management					
Co-requisites	Project Management and Financial Development Planning Design Lab VII					

### **Catalog Description**

The aim of the course is to provide advance learning on the field of Environment Planning in the context of EIA which is one of the key concern of policy makers and land use planner. The course will generally be conducted in the seminar/studio mode to encourage research, exploration and skill developments. The aim of this course is to provide exposure to the students to essential understanding of Environmental Impact Assessment (EIA). UNEP defines Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. This course will enable the students using EIA as tool for both environmental and economic benefits, such as reduced cost and time of project implementation and design, avoided treatment/clean-up costs and impacts of laws and regulations. Students will also be able to apply or reference these techniques in their planning studios. The course contents to be followed will be developed by course teachers based on the resources at hand and opportunities for interdisciplinary learning. The course would be conducted through literature survey, case studies, site visits, community surveys and hands on experimentations. During the course the students will be working on live projects in groups which are preferably interdisciplinary.

### **Course Objectives**

The objective of this course is

1. To learn with different methods and process of Environment Impact Assessment.
2. To develop interdisciplinary understanding and sensitivities of future planners.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Apply EIA techniques while assessing the impacts on land use, resources, health and social conditions.

CO2: Prepare the detail report and presentation on a given project related to Environment Impact Assessment.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Introduction</b></p> <p>Role of Environmental Impact Assessment in the planning and decision-making process; Definition and need, evolution and objectives and scope. Different methods of Environmental Impact Assessment; Advantages and limitations; Public - private - people's participation in EIA, Impact assessment on land use, resources, social and health impacts.</p>	L1, L2, L3	12
<p><b>MODULE 2: Project Work</b></p> <p>Selection and understanding of case study by reviewing case studies from India and abroad on projects of various types covering different levels of planning and practical exercises on Environmental Impact Assessments. Formulation of aim and objectives, Collection of data through primary and secondary sources; Conducting survey; Database development using relevant and advance software; Qualitative and quantitative data analysis; Report writing and presentations.</p>	L4, L5, L6	24

*\*Bloom's Level:*

*L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation*

### **Text Books**

1. Raman N.S., Gajbhiye, A.R., (2014). Environmental Impact Assessment, I. K. International Publishing House New Delhi, India
2. Marriott, Betty Bowers, (1997). Environmental Impact Assessment – A Practical Guide, Mcgraw Hill, New Delhi, India
3. Watheren, Peter, (2004). Environmental Impact Assessment: Theory and Practice, Tayler & Francis, New York & London

## Reference

1. Jay, S., Jones, C., Slinn, P., & Wood, C. (2007). Environmental impact assessment: Retrospect and prospect. *Environmental Impact Assessment Review*, 27(4), 287–300. <https://doi.org/10.1016/j.eiar.2006.12.001>
2. Ott, K., Mohaupt, F., & Ziegler, R. (2012). Environmental Impact Assessment. In *Encyclopedia of Applied Ethics* (pp. 114–123). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-373932-2.00345-8>

## Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination

### Examination Scheme:

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	-	-	-	90	05	05	-

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

### CO, PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	1	--	--	1	1	--	--	2	1	--	1	--	1	2
CO2	1	2	2	--	--	--	--	--	--	--	--	--	1	2	--	2

1: strongly related, 2: moderately related and 3: weakly related

## Syllabus – Fourth Semester

	<b>PLANNING LEGISLATION AND PROFESSIONAL PRACTICE (PLN4403)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	1	0	0	2
Pre-requisites/Exposure	Planning Legislation (B.Plan)					
Co-requisites	Planning Practice I & II, Human Values in Planning (B.Plan)					

### Catalog Description

The aim of this course is to introduce the significance of planning laws, legislations, acts, regulations and professional practices in planning. As students are passing out after this semester, therefore, the relevance of this subject becomes very crucial at this stage. At the end of the course student will be able to utilise the learnt skills of planning legislations and professional practice in their career.

### Course Objectives

The objective of this course is

1. To prepare students to deal with legal dimensions of planning.
2. To equip students with professional planning ethics to transform them into committed and responsible future planner.

### Course Outcomes

On completion of this course, the students will be able to

CO1: Grasp basic legal terminologies for enhanced understanding of legislation.

CO2: Comprehend land related legislations as well as getting an enriched knowledge of Urban and Regional planning Acts.

CO3: Analyze environmental planning regulations and laws.

CO4: Absorb professional planning ethics/values and transforming into a professional planner.

Modules	Blooms level*	Number of hours
<p><b>MODULE 1: Basic Terminologies and Legislation</b></p> <p>The meaning, significance and objectives of planning legislation; Evolution of planning legislation and overview; Concept of Law; Sources of law; meaning of the term of law, legislation, ordinance, bill act, regulations and bye-laws; doctrine of separation of powers; judiciary, legislature and executive-rule of law, Judicial precedents; PIL; significance of law and its relationship to urban planning; Indian Constitution.</p>	L3, L4 L5	9
<p><b>MODULE 2: Land related Legislation, Urban and Regional Planning Acts</b></p> <p>Land Acquisition Act 1894; Betterment charges and compensation provisions in planning law; Legislation controlling use of land, ULCRA; Tools of development control-zoning, sub-division regulations, building regulations, model building byelaws, Special regulations like TDR, Rent Control Acts; Apartment Ownership Acts; Transfer of Property Right Act; The estate duty Act; Easement Act; Slum improvement and clearance Act, Indian Contract Act; Arbitration and conciliation Act</p> <p>Municipal Acts; Improvement Trust and Development Authority Acts; Model town and Country planning Acts; Legislations relating to urban art commissions; 73<sup>rd</sup> and 74<sup>th</sup> Constitutional Amendments; Cooperative Societies Act; Special Purpose Legislations viz; Special Economic Zones Act; Special Investment Region Act.</p>	L3, L4 L5	9



<p><b>MODULE 3: Environmental Legislations</b></p> <p>Evolution of environmental Law in India; Law of Torts; the first environmental law; Pollution control Act- air, water and environmental protection acts; Forest and wildlife acts; other important international environmental laws; Hazardous waste management and handling rules/biomedical rules/solid waste management rules; Environment tribunal act; Archaeological sites and remains of national importance; Conservation of natural resources including mining and forestry acts; MOEF guidelines and notifications.</p>	L3, L4 L5	9
<p><b>MODULE 4: Professional Practice</b></p> <p>Role of a Planner; relationship with client, developers, institutions contractors and experts; Role and responsibilities of planning consultants, professional ethics, code of conduct and scale of professional charges; Role in interdisciplinary groups; Formulation of project proposal and outlines; consultancy agreements, contracts and inviting tenders; Nature of Engagements, agreements and safeguards, completion and copyrights; Aims and Objectives of the professional institute.</p>	L3, L4 L5	9

\*Bloom's Level:

L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Campbell, H., & Marshall, R. (1998). Acting on principle: dilemmas in planning practice. *Planning Practice and Research*, 13(2), 117–128. <https://doi.org/10.1080/02697459816139>
2. Kulshreshtha, S.K. (2012) Urban and Regional Planning in India - A Handbook of Professional Practice, SAGE Publications India Private limited, New Delhi

### References

1. Dwivedi, S. K., & Kashyap, P. K. (2013). Environmental Protection Law and Policy in India. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2266021>
2. Sivaramakrishnan, K. (2011). Environment, law, and democracy in India. *Journal of Asian Studies*, 70(4), 905–928. <https://doi.org/10.1017/S0021911811001719>

### Suggested Readings of Bare Acts

1. Town and Country Planning Act (any State Act)

2. Model Municipal Act, Ministry of Urban Development, Government of India
3. Nagar Raj Act (any State Act )
4. Environment Protection Act (Central Act)
5. Mining and Forestry Act (Central Act)
6. Building Byelaws (any State Act )
7. Apartment Ownership Act (any State Act )
8. Development Authority Act (any State Act )
9. Water Bodies Conservation Act (any State Act )

**Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

**Examination Scheme:**

Components	CT-1	CT-2	HA	S/P	CE	A	ESE
Weightage (%)	10	10	10	10	05	05	50

CT: Class Test, HA: Home Assignment, S/P: Seminar/Presentation, CE: Continuous Evaluation, A: Attendance; ESE: End Semester Examination.

**CO, PO and PSO mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	--	--	--	--	--	--	--	--	--	1	1	--	--	1
CO2	1	1	--	2	--	--	--	--	2	--	--	1	1	--	1	1
CO3	1	1	--	2	--	--	--	--	2	--	--	1	1	--	1	1
CO4	1	1	--	2	--	--	--	--	2	--	--	1	1	--	1	1

1: strongly related, 2: moderately related and 3: weakly related

	<b>PLANNING THESIS (PLN4437)</b>	L	T	P	S	C
Version 1.1	Date of Approval:	2	0	0	16	18
Pre-requisites/Exposure	Planning Studio I, II & III					
Co-requisites	All Theory and Elective Subjects					

### **Catalog Description**

The aim of thesis is to develop independent critical thinking and design/research abilities and apply the knowledge gained, skills developed and professionalism inculcated over the last three semesters in an exercise of own interest and significant complexity. The thesis project is to be undertaken independently by each student on a topic of his/her choice related to urban and regional planning, selected and approved by the faculty during the previous semester as part of course requirements of the subject seminar. The students' needs to present and defend their thesis research work in periodic juries conducted by the department as well as in the external jury appointed by the University/School. They are also expected to write a thesis report with the constant guidance of respective guides. Students will submit the same before external jury in a hard bound prescribed format, given by the department.

### **Course Objectives**

The objective of this course is

1. To utilize acquired knowledge in planning and reviewed literature for conceptualizing and pursuing good research.
2. To provide viable solutions to the undertaken research problem and document the entire work.

### **Course Outcomes**

On completion of this course, the students will be able to

CO1: Conceptualise a rationale research problem and creating a good research Design.

CO2: Drawing meaningful insights as well as communicate and document practical ideas to solve the selected problem.

Module	Blooms level*	Number of hours
<b>Module 1: Research Problem and Research Design</b> <ul style="list-style-type: none"> <li>• Conceptualization of Research problem for Thesis work.</li> <li>• Background and Need of the study area.</li> <li>• Rigorous Literature review</li> <li>• Formulation of Aim and objectives.</li> <li>• Writing objective based Research Questions.</li> <li>• Constructing Research Methodology.</li> <li>• Designing Analytical Framework.</li> <li>• Sampling and Sample selection.</li> <li>• Preparations of Check list and Questionnaire.</li> <li>• Methods of data collection.</li> </ul>	L3, L4, L5	26
<b>Module 2: Data Analysis, Proposals and Report Writing</b> <ul style="list-style-type: none"> <li>• Processing and Interpretation of data.</li> <li>• Data Analysis.</li> <li>• Findings and Results.</li> <li>• Identification of Issues</li> <li>• Conclusions.</li> <li>• Formulation of policies/Proposal Plans.</li> <li>• Strategies and Recommendations.</li> <li>• Suggestion for Future Research, if any</li> <li>• Report Writing.</li> </ul>	L4, L5, L6	190

\*Bloom's Level: L1-Knowledge; L2-Comprehension; L3-Application; L4:Analysis; L5:Synthesis, L6:Evaluation

### Text Books

1. Evans, D., Gruba, P., & Zobel, J. (2014). *How to Write a Better Thesis. How to Write a Better Thesis*. Springer International Publishing. <https://doi.org/10.1007/978-3-319-04286-2>
2. Condry, R. (2004). Writing Your Thesis. *The British Journal of Sociology*, 55(4), 597–598. [https://doi.org/10.1111/j.1468-4446.2004.00040\\_9.x](https://doi.org/10.1111/j.1468-4446.2004.00040_9.x)
3. Shanti Bhushan Mishra and Shashi Alok., (2017): Hand Book of Research Methodology, Gate Research
4. Wentz, E. A. (2017). *How to Design, Write, and Present a Successful Dissertation Proposal. How to Design, Write, and Present a Successful Dissertation Proposal*. SAGE Publications, Ltd. <https://doi.org/10.4135/9781506374710>

### Reference Books

1. American Psychological Association. (2010). *APA Sixth Edition. Intellectual Property* (Vol. 1968, p. 272). <https://doi.org/10.1006/mgme.2001.3260>

2. Chinelo Lgwenagu, (2016): Fundamental of Research Method and data collection, British Council, Research Gate
3. Jennifer Mason, (2002): Qualitative Researching, 2nd edition, SAGE Publications, London
4. Neville, C. (2007). The complete guide to referencing and avoiding plagiarism. *Open University Press*, 27–41. <https://doi.org/10.1016/B978-0-08-100072-4.00007-1>
5. Taylor, G. (2009). *A Student's Writing Guide: How to Plan and Write Successful Essays. Social Sciences* (p. 266). Retrieved from <http://www.cambridge.org/9780521729796>

### **Modes of Evaluation: Presentation/Assignment/Class Test /Written Examination**

#### **Examination Scheme:**

<b>Components</b>	<b>P -1</b>	<b>P -2</b>	<b>S</b>	<b>R</b>	<b>CI</b>	<b>A</b>	<b>ESE</b>
<b>Weightage (%)</b>	100	100	100	50	45	05	400

P: Presentation, S: Seminar (Internal Jury), R: Report, CI: Class Interaction (continuous evaluation by guide), A: Attendance; ESE: End Semester Examination.

#### **CO, PO and PSO mapping**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>
<b>CO1</b>	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
<b>CO2</b>	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1

1: strongly related, 2: moderately related and 3: weakly related