



**AMITY UNIVERSITY**  
— R A J A S T H A N —

**Master of Technology  
(Computer Science & Engineering)**

**Programme Code: MTC**

**12009**

**Duration – 2 Years Full Time**

**Programme Structure  
And  
Curriculum & Scheme of Examination**

**2020-2022**

**AMITY UNIVERSITY  
RAJASTHAN**

## 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.

This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure includes the courses (Core and Elective), arranged semester wise. 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). Towards earning credits in terms of contact hours, 1 Lecture and 1 Tutorial per week are rated as 1 credit each and 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-T-P structure of 3-0-0 will have 3 credits, 3-1-0 will have 4 credits, and 3-1-2 will have 5 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:

<u>Components</u>	<u>Codes</u>	<u>Weightage (%)</u>
Case Discussion/ Presentation/ Analysis	C	05 - 10
Home Assignment	H	05 - 10
Project	P	05 - 10
Seminar	S	05 - 10
Viva	V	05 - 10
Quiz	Q	05 - 10
Class Test	CT	10 - 15
Attendance	A	05
End Semester Examination	EE	70

It is hoped that it will help the students study in a planned and a structured manner and promote effective learning. Wishing you an intellectually stimulating stay at Amity University.

# Program Learning Outcomes – PLO

1. Students will be able to demonstrate the role of Computer Science in the following core knowledge areas
  - a. Algorithms, Data Structures, and Databases
  - b. Programming Languages and Compilers
  - c. Software Engineering and Development
  - d. Computer Hardware and Architecture
  - e. Data Communication and Computer Networks
2. Students will be able to generate optimized solutions by formulating and implementing analytical tools for upcoming issues in the field of computer science and engineering.
3. Students will be able to apply knowledge of mathematical, scientific, and computer science to evaluate, analyze, synthesize, model, and integrate technologies to develop new computer systems for applied engineering systems.
4. Students will be able to demonstrate independent learning and scholarship by adopting research pursuits.
5. Students will recognize the role of technological advances impacting society and the social, legal, ethical, cultural and communicative implications of computer technology and its usage.

## PROGRAMME STRUCTURE

### FIRST SEMESTER

Subject Code	Course	Category	L	T	P/FW	Credit Units
MTC-101	Data Structure & Algorithm Design	CC	2	1	-	3
MTC-102	Object Oriented Software Engineering	CC	2	1	-	3
MTC-103	Operating System and Unix	CC	2	1	-	3
MTC-123	Operating System and Unix Lab	CC	-	-	2	1
MTC-160	Seminar I (critical review of a research publication)	CC	-	-	-	3
MTC-161	Seminar II (critical review of a research publication)	CC	-	-	-	3
<b>Domain Elective-I : Choose any one from the following courses</b>						
MTC-104	Software Project Planning & Management	DE	2	1	-	3
MTC-105	Advance DBMS	DE	2	1	-	3
<b>Value Added Courses</b>						
BCS-111	Communication Skills – I	VA	1	-	-	1
BSS-111	Behavioural Science –I	VA	1	-	-	1
	Foreign Language – I	VA	2	-	-	2
FLF-111	French					
FLG-111	German					
FLS-111	Spanish					
FLC-111	Chinese					
	<b>Total</b>					<b>23</b>

## SECOND SEMESTER

Code	Course	Category	L	T	P/FW	Credit Units
MTC-201	Compiler Design	CC	2	1	-	3
MTC-202	Enterprise Java Application using J2EE	CC	2	1	-	3
MTC-203	Advanced Computer Networks	CC	2	1	-	3
MTC-204	Soft Computing	CC	2	1	-	3
MTC-221	Compiler Design Lab	CC	-	-	2	1
MTC-222	Enterprise Java Application using J2EE Lab	CC	-	-	2	1
MTC-223	Advanced Computer Networks Lab	CC	-	-	2	1
MTC-260	Minor Project	CC	-	-	-	5
<b>Domain Elective - II : Choose any one from the following courses</b>						
MTC-205	Cloud Computing	DE	2	1	-	3
MTC-206	Advanced Computer Organization	DE	2	1	-	3
MTC-207	Computer Oriented Operational Research	DE	2	1	-	3
<b>OPEN ELECTIVE</b>						
	OPEN ELECTIVE-I	OE	3	-	-	3
<b>VALUE ADDED</b>						
BCS-211	Communication Skills – II	VA	1	-	-	1
BSS-211	Behavioural Science –II	VA	1	-	-	1
	Foreign Language – II	VA	2	-	-	2
FLF-211	French					
FLG-211	German					
FLS-211	Spanish					
FLC-211	Chinese					
	<b>Total</b>					<b>30</b>

### THIRD SEMESTER

Code	Course	Category	L	T	P/FW	Credit Units
MTC-301	Data Warehousing & Data Mining	CC	2	1	-	3
MTC-302	Network Security & Management	CC	2	1	-	3
MTC-321	Data Warehousing & Data Mining Lab	CC	-	-	2	1
MTC-360	Dissertation (Evaluation of Plan and Critical Literature Review )	CC	-	-	-	3
<b>Domain Elective : Choose any one from the following courses (Lab Courses to be clubbed with their respective theory courses)</b>						
MTC-303	Pattern Recognition & Image Processing	DE	2	1	-	3
MTC-322	Pattern Recognition & Image Processing Lab	DE	-	-	2	1
MTC-304	ASP. NET	DE	2	1	-	3
MTC-323	ASP. NET Lab	DE	-	-	2	1
MTC-305	Real Time Operating System	DE	3	1	-	4
MTC-306	Mobile Computing	DE	3	1	-	4
MTC-307	Ad Hoc & Wireless Sensor Network	DE	3	1	-	4
<b>OPEN ELECTIVE</b>						
	OPEN ELECTIVE-II	OE	3	-	-	3
<b>VALUE ADDED</b>						
BCS-311	Communication Skills – III	VA	1	-	-	1
BSS-311	Behavioural Science –III	VA	1	-	-	1
	Foreign Language – III	VA	2	-	-	2
FLF-311	French					
FLG-311	German					
FLS-311	Spanish					
FLC-311	Chinese					
	<b>Total</b>					<b>21</b>

### FOURTH SEMESTER

Code	Course	Category	L	T	P/FW	Credit Units
MTC-455	Dissertation	CC	-	-	-	30
	<b>TOTAL</b>					<b>30</b>

# DATA STRUCTURES AND ALGORITHM DESIGN

**Course Code: MTC 101**

**Credit Units: 03**

## Course Objective:

The objective of this course is to expose the students to the Fundamentals and advance concepts in Data Structure Using C. This course discusses about Problem solving approaches, Structured Programming Concepts, Guidelines for good Program Structure, Arrays, Stacks, Trees, Graphs, Searching & Sorting and File Structure.

## Course Contents:

### Module I

Overview of data structures, Review of Arrays, sparse matrices, Stacks, Queues, linked lists , doubly linked lists, Applications, dynamic storage management

### Module II

Algorithm analysis, Efficiency of algorithms, Asymptotic Notations, Time complexity of an algorithm, Apriori Analysis, Analyzing Recursive Programs using various strategies

### Module III

Divide and Conquer Paradigm: Divide and conquer recurrence equations and their solutions, Review of various sorting techniques using divide and conquer approach, Strassen's matrix multiplication.

### Module IV

Trees: Basic terminology, Binary Trees and its representations, Binary Search Trees, Binary Search Tree traversals, Red-Black Trees, AVL Trees and B Trees, applications of trees, Graphs: Terminology, representations, traversals, spanning trees, shortest paths, Basic Graph Algorithms, Depth first search and Breadth first Search and its analysis, single source shortest path problem, Dijkstra's algorithm

### Module V

Greedy Paradigm: Basic greedy strategy, Algorithms of Kruskal's and Prim's, greedy strategy in algorithms for the knapsack problem and Huffman trees.

Dynamic Programming paradigm, all pairs shortest path problem, longest common subsequence problems, 0 / 1 Knapsack problem, traveling sales person's problem.

### Module VI

Back Tracking: general method, 4 Queen's Problem, Branch and Bound: general method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem.

### Module VII

String Matching Algorithms: Knuth Morris and Pratt paradigm, Computation of the failure functions for the Boyer-Moore algorithm, NP – Complete and NP hard problem, SAT problems

## Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## Text & References:

### Text:

- Thomas H. Cormen, Charles E. Leiserson, and Ronald L. Rivest, "Introduction to Algorithms", MIT press and McGraw Hill, 2001.
- Udi Manber, "Introduction to Algorithms: A Creative Approach", Addison Wesley, 1989.
- Ellis Horowitz, Sartaj sahani, "Fundamentals of Data Structures" Galgotia book source, New Delhi, 1983.
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### References:

- Ellis Horowitz, Sartaj sahani, "Fundamentals of Algorithms" Galgotia book source, New Delhi, 1986.
- Jean paul Tremblay and paul G. Soresson, "An introduction to Data structures with applications" Mcgraw Hill International editions.
- Seymour Lipschutz, "Theory and problems of Data structures", Mcgraw Hill International editions. (Schaum's outline series).
- Aho, Hopcroft Ullman, "The design and analysis of computer algorithms" Addison Wesley publishing company
- Robert L Cruse : "Data Structures and Program Design" (Prentice Hall India ,3rd Edition 1999)

# OBJECT ORIENTED SOFTWARE ENGINEERING

**Course Code:** MTC 102

**Credit Units:** 03

## **Course Objective:**

The objective of this course is to expose the students to the Fundamentals and benefits of software reuse and some reuse problems .To provide a clear understanding of the advance concepts in developing different types of reusable component and processes for reuse .

## **Course Contents:**

### **Module I**

Review of the traditional methodologies, Object oriented methodology, Advantage of Object oriented methodology

### **Module II**

Fundamental concepts of Object Orientation: Object, Class, Abstraction, Interface, Implementation, Aggregation, Composition, Generalization, Sub-Class and Polymorphism, Architecture Style, Object-oriented software engineering, application & component systems, use case components, object components, layered architecture.

### **Module III**

Sub- Systems, Services, Coupling, Cohesion and Layering, Static and dynamic aspects of collaborations Reuse processes, Object oriented business engineering, applying business engineering to define processes & organization, application family engineering, component system engineering, application system engineering

### **Module IV**

Organizing a reuse business: Its transaction, Management, working Component based software development: component definition, component meta model, component engineering vs application engineering

### **Module V**

Visual Modeling, Object Oriented Modeling, Component based and Model driven development using UML:, UML Basics, Component specification, context realization, component realization cases, Actors, and 4+1View.

## **Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>S/V/Q</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## **Text & References:**

### **Text:**

- Ivan Jacobson, Griss Jacobson, Patrick Johnsson, “Software Reuse: Architecture, Process and Organization for business Success, ACM press books, 1997

### **References:**

- Joffrey S. Poutin, “Measuring Software Reuse: Principles Practices, Economic Models”, Addison Wesley, 2001
- Hans-Gerhard Gross, “Component based Software testing with UML”, Springer-Verlag, Berlin, 2005

# OPERATING SYSTEM AND UNIX

**Course Code: MTC 103**

**Credit Units: 03**

## **Course Objective:**

To study the advanced concepts of operating system. The students studies Unix operating system that gives a practical insight into the subject.

## **Course Contents:**

### **Module I**

Theory and implementation aspects of distributed operating systems. Inter-process communication and co-ordination in large distributed systems. Distributed resource management. Information management in distributed systems: security, integrity and concurrency problems.

### **Module II**

Reviewto real time system, embedded systems and reactive systems; Hard and Soft Real Time Systems; Handling real time systems.

### **Module III**

Unix operating System- Unix Architecture, Features of Unix, Unix File system. Unix system calls, Unix processes- UNIX process control and management, PCB, signals, forks and pipes, process scheduling, Filter-simple filters, grep, sed, AWK,

### **Module IV**

Memory management in unix, Interprocess communication, I/O subsystem, editors and compilers for unix, LEX and YACC, shell programming, Interrupt processing, OS kernel FLIH, dispatcher, Networks, Routing, Connection strategies, remote file systems.

### **Module V**

System Administration, multiprocessor systems, Distributed unix sytem Fault tolerance issues. OS issues related to the Internet, intranets, pervasive computing, embedded systems, mobile systems and wireless networks.

## **Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## **Text & References:**

### **Text:**

- The Design of the UNIX Operating System [Prentice-Hall Software Series]- Maurice Bach
- Real Time systems- Krishna- MHE

### **References:**

- Learning the Unix Operating System, Jerry Peek, O'Relly
- Programmer\*s Reference Manual: Operating System Api For Intel Processors : Unix System V Release 4,Unix System Laboratories
- Unix Concepts & Applications- TMH- Sumitabha Das
- Distributed Operating Systems by Tanenbaum – Dorling Kindersley
- B. W. Kernighan & R. Pike, “The UNIX Programming Environment” Prentice Hall of India, 2000
- Sumitabha Das “ Your UNIX The ultimate guide” Tata McGraw Hill
- “Design of UNIX Operating System”, The Bach Prentice – Hall of India

## OPERATING SYSTEM AND UNIX LAB

**Course Code: MTC 123**

**Credit Units: 01**

### Requirements: Unix Operating System

Assignments will be provided for the following

- Overview UNIX Commands
- vi editor commands
- Programming in shell script
- Introduction to programming in AWK

### Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	20	10	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

### Text & References:

- “Unix Programming Environment” The Kernighan and Pike Prentice – Hall of India
- “Unix –Shell Programming” Kochar
- “ Unix Concepts and application” Das Sumitabha Tata Mcgraw Hill

# **SEMINAR I (CRITICAL REVIEW OF A RESEARCH PUBLICATION)**

**Course Code: MTC 160**

**Credit Units: 03**

## **SEMINAR II (CRITICAL REVIEW OF A RESEARCH PUBLICATION)**

**Course Code: MTC 161**

**Credit Units: 03**

# SOFTWARE PROJECT PLANNING AND MANAGEMENT

**Course Code: MTC 104**

**Credit Units: 03**

## **Course Objective:**

- A. To provide students with a clear understanding of the unique risks, issues, and critical success factors associated with technology projects
- B. To introduce students to the role and function of project management

## **Course Contents:**

### **Module I**

Exposure to Software Project Management: Software development as a project, Stakeholders in software project, Software product, process, resources, quality, and cost, Objectives, issues, and problems relating to software projects.

### **Module II**

Overview of Project Planning: Steps in project planning; Defining scope and objectives; work breakdown structure; Deliverables and other products

### **Module III**

Software Effort Estimation: Problem in software estimation; Effort estimation techniques COCOMO model. Risk Analysis and Management: Nature and categories of risk in software development; risk Identification; Risk assessment; Risk mitigation, monitoring, and management;

### **Module IV**

Selection of Appropriate Project Approach: Rapid application development; Waterfall model; V-process model; Spiral model; Prototyping,; Incremental delivery.

### **Module V**

Software Quality Assurance : Planning for quality; Product versus process quality management; Procedural and quantitative approaches; Defect analysis and prevention; Statistical process control; Pareto analysis; Causal analysis; Quality standards; ISO 9000; Capability Maturity Model; Quality audit.

## **Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>S/V/Q</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## **Text & References:**

- Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
- Software Project Management, Joel Henry, Pearson Education.
- Software Project Management in practice, Pankaj Jalote, Pearson Education.2005
- Software Project Management by M. Cotterell
- Software Project Management by S. A. Kelkar
- Henry J. “Software Project Management-A Real world Guide to Success”. Addison Wesley

# ADVANCE DBMS

**Course Code:**

**MTC 105**

**Credit Units: 03**

## **Course Objective:**

The objective of this course is to expose the students to the implementation techniques of database system. This course explains techniques for query processing and optimization with transaction and concurrency control techniques

## **Course Contents:**

### **Module I: Relational Databases**

Integrity Constraints revisited, Extended ER diagram, Relational Algebra & Calculus, Functional, Multivalued and Join Dependency, Normal Forms, Rules about functional dependencies.

### **Module II: Query Processing and Optimization**

Valuation of Relational Operations, Transformation of Relational Expressions, Indexing and Query Optimization, Limitations of Relational Data Model, Null Values and Partial Information.

### **Objected Oriented and Object Relational Databases**

Modeling Complex Data Semantics, Specialization, Generalization, Aggregation and Association, Objects, Object Identity, Equality and Object Reference, Architecture of Object Oriented and Object Relational Databases

### **Module III: Parallel and Distributed Databases**

Distributed Data Storage – Fragmentation & Replication, Location and Fragment  
Transparency Distributed Query Processing and Optimization, Distributed Transaction Modeling and concurrency Control, Distributed Deadlock, Commit Protocols, Design of Parallel Databases, Parallel Query Evaluation.

### **Advanced Transaction Processing**

Nested and Multilevel Transactions, Compensating Transactions and Saga, Long Duration Transactions, Weak Levels of Consistency, Transaction Work Flows, Transaction Processing Monitors.

### **Module IV**

Multimedia databases, Databases on the Web and Semi-Structured Data  
Case Study: Oracle Xi

## **Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## **Text & References:**

### **Text:**

- Elmarsi, Navathe, Somayajulu, Gupta, “Fundamentals of Database Systems”, 4<sup>th</sup> Edition, Pearson Education, 2007
- Garcia, Ullman, Widom, “Database Systems, The complete book”, Pearson Education, 2007
- R. Ramakrishnan, “Database Management Systems”, McGraw Hill International Editions, 1998

### **References:**

- Date, Kanna, Swaminathan, “An Introduction to Database Systems”, 8th Edition Pearson Education, 2007
- Singh S.K., “Database System Concepts, design and application”, Pearson Education, 2006.
- Silberschatz, Korth, Sudarshan, “Database System Concepts”, Mcgraw Hill, 6<sup>th</sup> Edition, 2006
- W. Kim, “Modern Database Systems”, 1995, ACM Press, Addison – Wesley,
- D. Maier, “The Theory of Relational Databases”, 1993, Computer Science Press, Rokville, Maryland
- Ullman, J. D., “Principals of database systems”, Galgotia publications, 1999
- Oracle Xi Reference Manual
- Dietrich, and Urban, “An Advanced Course in Database Systems”, Pearson, 2008.

# COMMUNICATION SKILLS – I

**Course Code:** BCS 111

**Credit Units: 01**

## **Course Objective:**

The Course is designed to give an overview of the four broad categories of English Communication thereby enhance the learners' communicative competence.

## **Course Contents:**

### **Module I: Listening Skills**

Effective Listening: Principles and Barriers  
Listening Comprehension on International Standards

### **Module II: Speaking Skills**

Pronunciation and Accent  
Reading excerpts from news dailies & magazines  
Narrating Incident; Story telling.  
Extempore & Role Plays

### **Module III: Reading Skills**

Vocabulary: Synonyms, antonyms, diminutives, homonyms, homophones  
Idioms & phrases  
Foreign words in English

### **Module IV: Writing Skills**

Writing Paragraphs  
Précis Writing  
Letter writing  
Coherence and structure  
Essay writing

### **Module V: Activities**

News reading  
Picture reading  
Movie magic  
Announcements

## **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>CAF</b>	<b>V</b>	<b>GD</b>	<b>GP</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	25	10	10	10	5

CAF – Communication Assessment File

GD – Group Discussion

GP – Group Presentation

## **Text & References:**

- Working in English, Jones, Cambridge
- Business Communication, Raman – Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge

# BEHAVIOURAL SCIENCE - I

## (SELF-DEVELOPMENT AND INTERPERSONAL SKILLS)

**Course Code:** BSS 111

**Credit Units: 01**

### **Course Objective:**

This course aims at imparting an understanding of:  
Self and the process of self exploration  
Learning strategies for development of a healthy self esteem  
Importance of attitudes and their effect on work behaviour  
Effective management of emotions and building interpersonal competence.

### **Course Contents:**

#### **Module I: Understanding Self**

Formation of self concept  
Dimension of Self  
Components of self  
Self Competency

#### **Module II: Self-Esteem: Sense of Worth**

Meaning and Nature of Self Esteem  
Characteristics of High and Low Self Esteem  
Importance & need of Self Esteem  
Self Esteem at work  
Steps to enhance Self Esteem

#### **Module III: Emotional Intelligence: Brain Power**

Introduction to EI  
Difference between IQ, EQ and SQ  
Relevance of EI at workplace  
Self assessment, analysis and action plan

#### **Module IV: Managing Emotions and Building Interpersonal Competence**

Need and importance of Emotions  
Healthy and Unhealthy expression of emotions  
Anger: Conceptualization and Cycle  
Developing emotional and interpersonal competence  
Self assessment, analysis and action plan

#### **Module V: Leading Through Positive Attitude**

Understanding Attitudes  
Formation of Attitudes  
Types of Attitudes  
Effects of Attitude on  
Behaviour  
Perception  
Motivation  
Stress  
Adjustment  
Time Management  
Effective Performance  
Building Positive Attitude

#### **Module VI: End-of-Semester Appraisal**

Viva based on personal journal  
Assessment of Behavioural change as a result of training  
Exit Level Rating by Self and Observer

### **Examination Scheme:**

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
<b>Weightage (%)</b>	20	05	20	30	25

## **Text & References:**

- Towers, Marc: Self Esteem, 1<sup>st</sup> Edition 1997, American Media
- Pedler Mike, Burgoyne John, Boydell Tom, A Manager's Guide to Self-Development: Second edition, McGraw-Hill Book company.
- Covey, R. Stephen: Seven habits of Highly Effective People, 1992 Edition, Simon & Schuster Ltd.,
- Khera Shiv: You Can Win, 1<sup>st</sup> Edition, 1999, Macmillan
- Gegax Tom, Winning in the Game of Life: 1<sup>st</sup> Edition, Harmony Books
- Chatterjee Debashish, Leading Consciously: 1998 1<sup>st</sup> Edition, Viva Books Pvt. Ltd.
- Dr. Dinkmeyer Don, Dr. Losoncy Lewis, The Skills of Encouragement: St. Lucie Press.
- Singh, Dalip, 2002, Emotional Intelligence at work; First Edition, Sage Publications.
- Goleman, Daniel: Emotional Intelligence, 1995 Edition, Bantam Books
- Goleman, Daniel: Working with E.I., 1998 Edition, Bantam Books.

# FRENCH - I

**Course Code:** FLF 111

**Credit Units: 02**

## Course Objective:

To familiarize the students with the French language

- with the phonetic system
- with the syntax
- with the manners
- with the cultural aspects

## Course Contents:

### Module A: pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1,2

Only grammar of Unité 3: objectif 3, 4 and 5

#### Contenu lexical: Unité 1: Découvrir la langue française: (oral et écrit)

1. se présenter, présenter quelqu'un, faire la connaissance des autres, formules de politesse, rencontres
2. dire/interroger si on comprend
3. Nommer les choses

#### Unité 2: Faire connaissance

1. donner/demander des informations sur une personne, premiers contacts, exprimer ses goûts et ses préférences
2. Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

#### Unité 3: Organiser son temps

1. dire la date et l'heure

#### Contenu grammatical:

1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel
4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation: Inversion, est-ce que, qui, que, quoi, qu'est-ce que, où, quand, comment, quel(s), quelle(s)  
Interro-négatif: réponses: oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futur proche

## Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

## Text & References:

- le livre à suivre: Campus: Tome 1

# GERMAN - I

**Course Code: FLG 111**

**Credit Units: 02**

## **Course Objective:**

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

## **Course Contents:**

### **Module I: Introduction**

Self introduction: heissen, kommen, wohnen, lernen, arbeiten, trinken, etc.

All personal pronouns in relation to the verbs taught so far.

Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),

Hallo, wie geht's?: Danke gut!, sehr gut!, prima!, ausgezeichnet!,

Es geht!, nicht so gut!, so la la!, miserabel!

### **Module II: Interviewspiel**

To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

### **Module III: Phonetics**

Sound system of the language with special stress on Diphthongs

### **Module IV: Countries, nationalities and their languages**

To make the students acquainted with the most widely used country names, their nationalities and the language spoken in that country.

### **Module V: Articles**

The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

### **Module VI: Professions**

To acquaint the students with professions in both the genders with the help of the verb “sein”.

### **Module VII: Pronouns**

Simple possessive pronouns, the use of my, your, etc.

The family members, family Tree with the help of the verb “to have”

### **Module VIII: Colours**

All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

### **Module IX: Numbers and calculations – verb “kosten”**

The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.

“Wie viel kostet das?”

### **Module X: Revision list of Question pronouns**

W – Questions like who, what, where, when, which, how, how many, how much, etc.

## **Examination Scheme:**

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

## **Text & References:**

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch

- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmoe, Deutsch als Fremdsprache 1A, Grundkurs

# SPANISH – I

**Course Code:** FLS 111

**Credit Units: 02**

## **Course Objective:**

To enable students acquire the relevance of the Spanish language in today's global context, how to greet each other. How to present / introduce each other using basic verbs and vocabulary

## **Course Contents:**

### **Module I**

A brief history of Spain, Latin America, the language, the culture...and the relevance of Spanish language in today's global context.

Introduction to alphabets

### **Module II**

Introduction to '*Saludos*' (How to greet each other. How to present / introduce each other).

Goodbyes (*despedidas*)

The verb *llamarse* and practice of it.

### **Module III**

Concept of Gender and Number

Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors, Revision of numbers and introduction to ordinal numbers.

### **Module IV**

Introduction to *SER* and *ESTAR* (both of which mean To Be). Revision of '*Saludos*' and '*Llamarse*'. Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of *Ser* and *Estar*.

### **Module V**

Time, demonstrative pronoun (*Este/esta, Aquel/aquella* etc)

### **Module VI**

Introduction to some key AR /ER/IR ending regular verbs.

## **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

## **Text & References:**

- Español, En Directo I A
- Español Sin Fronteras

# CHINESE – I

**Course Code: FLC 111**

**Credit Units: 02**

## Course Objective:

There are many dialects spoken in China, but the language which will help you through wherever you go is Mandarin, or Putonghua, as it is called in Chinese. The most widely spoken forms of Chinese are Mandarin, Cantonese, Gan, Hakka, Min, Wu and Xiang. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

## Course Contents:

### Module I

Show pictures, dialogue and retell.  
Getting to know each other.  
Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called “Hanyu Pinyin” in Mandarin Chinese.)  
Practicing of Tones as it is a tonal language.  
Changes in 3<sup>rd</sup> tone and Neutral Tone.

### Module II

Greetings  
Let me Introduce  
The modal particle “ne”.  
Use of Please ‘qing’ – sit, have tea ..... etc.  
A brief self introduction – Ni hao ma? Zaijian!  
Use of “bu” negative.

### Module III

Attributives showing possession  
How is your Health? Thank you  
Where are you from?  
A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.  
Are you busy with your work?  
May I know your name?

### Module IV

Use of “How many” – People in your family?  
Use of “zhe” and “na”.  
Use of interrogative particle “shenme”, “shui”, “ma” and “nar”.  
How to make interrogative sentences ending with “ma”.  
Structural particle “de”.  
Use of “Nin” when and where to use and with whom. Use of guixing.  
Use of verb “zuo” and how to make sentences with it.

### Module V

Family structure and Relations.  
Use of “you” – “mei you”.  
Measure words  
Days and Weekdays.  
Numbers.  
Maps, different languages and Countries.

## Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

## Text & References:

- “Elementary Chinese Reader Part I” Lesson 1-10

# COMPILER DESIGN

**Course Code:** MTC 201

**Credit Units:** 03

## Course Objective:

Compilers and interpreters are among the most widely used tools in software development. It is important for a computer scientist to understand the process by which programs written in high-level languages are translated and executed. The main objective of this course is to gain an in-depth understanding of the compilation process. After you complete this course, you should be able to: describe the theory and practice of compilation, in particular, the lexical analysis, parsing and code generation and optimization phases of compilation, and design a compiler for a concise programming language.

## Course Contents:

### Module I: Overview

Review of compiler phases – Informal Compiler Algorithm Notation – Symbol Table Structure – Intermediate Representations – Run Time Issues – Support for Polymorphic and Symbolic Languages.

### Module II: Analysis & Attribute Grammars

Control Flow Analysis – Data Flow Analysis – Dependency analysis – Alias analysis  
Attribute grammars: Analysis, use, tests, and circularity, Issues in type systems.

### Module III: Machine Independent Optimization

The Principal Sources of Optimization. Causes of Redundancy, A Running Example: Quicksort, Semantics-Preserving Transformations, Global Common Subexpressions, Copy Propagation, Dead-Code Elimination, Code Motion, Induction Variables and Reduction in Strength

### Module IV: Machine Dependent tasks

Register Allocation – Local and Global Instruction Scheduling – Advanced Topics in Code Scheduling – Low Level Optimizations – Introduction to interprocedural analysis and scheduling.

### Module V: ILP Compilation & Dynamic Compilation

ILP Compilation: Issues in compilation for ILP based processors. Effect of VLIW, Speculative, Predicated instructions, multithreaded processors.

Dynamic Compilation: Introduction, methods, case studies, implementation.

## Examination Scheme:

Components	CT	H	A	V/S/Q	EE
Weightage (%)	5	20	10	15	50

## Text & References:

### Text:

- Steven Muchnick. Advanced Compiler Design Implementation, Morgan Kaufmann Publishers, 1997
- Aho, A. V, Sethi, R. and Ullman, J. D. Compilers: Principles, Techniques and Tools, Addison Wesley, 1986

### References:

- Appel, A. W. Modern Compiler Implementation in Java, Cambridge University Press, 2000.
- Kenneth. C. Loudon, Compiler Construction. Principles and Practice. Thomson, 2003.

# ENTERPRISE JAVA APPLICATIONS USING J2EE

**Course Code: MTC 202**

**Credit Units: 03**

## Course Objective:

The objective is to equip the students with the advanced feature of contemporary java which would enable them to handle complex programs relating to managing data and processes over the network. The major objective of this course is to provide a sound foundation to the students on the concepts, precepts and practices, in a field that is of immense concern to the industry and business.

## Course Contents:

### Module I

J2EE Architecture, N-Tier Architecture, Application Server, Application Server Services, Server Management and Control, Configuration, Monitoring and Mapping of Server, Deployment Issues, Performance Tuning and Security.

### Module II

Implementing J2EE Applications, Database connection using JDBC API, Servlets, Java Server Pages. Overview of EJB, Session EJBs, Entity EJBs, and MDB, The Model-View-Controller Architecture, Overview of Struts, Implementation of Struts Framework.

### Module III

Overview of XML, XML fundamentals, well-formed XML documents, components of XML document, DTD, Attributes and Entities of DTD, XML style sheets, XSL, CSS, XML namespaces, implementing J2EE Application using XML, Deployment descriptor, Mapping file.

### Module IV

Hibernate: Principles of Object Relational Mapping, Hibernate configuration, HQL making objects persistent, Hibernate semantics, Session management, flushing, concurrency and Hibernate, Optimistic and Pessimistic Locking, Object mapping Mapping simple properties, Single and multi valued associations, Bi-directional associations, Indexed collections.

### Module V

Application Servers (Case Study of any one of Apache Tomcat, BEA Weblogic, JBoss), Service-Oriented Architectures SOAP, SOAP message structure, handling errors WSDL, UDDI. Java Web Service JAX-RPC.

## Examination Scheme:

Components	CT	H	V/S/Q	AT	EE
Weightage (%)	5	20	10	15	50

## Text & References:

### Text:

- Java 2 Unleashed (Techmedia – SAMS) By Jamie Jaworski
- Professional Java Server Programming ( a Press ) By Allamaraju
- Developing Java Servlets (Techmedia – SAMS) By James Goodwill
- Using Java 1.2 Special Edition ( PHI ) By Webber
- Jim Farley, William Crawford, O'Reilly and Associates, "Java Enterprise in a Nutshell", 2005
- Java Server Programming J2EE 1.4 Edition (Dreamtech )
- Brett McLaughlin, O'Reilly, "Java and XML, 2<sup>nd</sup> Edition, 2001

### References:

- David Flanagan, Jim Parley, William Crawford & Kris Magnusson , Java Enterprise in a nutshell- A desktop Quick reference -O'REILLY, 2003
- Stephen Ausbury and Scott R. Weiner, Developing Java Enterprise Applications, Wiley-2001
- Jaison Hunder & William Crawford, Java Servlet Programming, O'REILLY, 2002
- Dietal and Deital, "JAVA 2" PEARSON publication
- Elliott Rusty Harold and W. Scott Means, O'Reilly, "XML in a Nutshell", 2001
- James Cooper, "Java Design Patterns: A Tutorial", Addison Wesley
- Govind Sesadri, "Enterprise java Computing: Application and Architectures", Cambridge University Publications, 1999
- "Rule Based Expert Systems", Narosa Publishing House, 1994.

# ADVANCED COMPUTER NETWORKS

**Course Code: MTC 203**

**Credit Units: 03**

## Course Objective:

The objective of the course is to provide thorough understanding & in-depth knowledge of concepts in computer networks Such as Internet protocols and routing, local area networks, wireless communications and networking, performance analysis, congestion control, TCP, network address translation, multimedia over IP, switching and routing, mobile IP, multicasting, IPv6. Peer-to-peer networking, network security, and other current research topics. A focus will be placed on wireless networking, reflecting rapid advances in this area. This course motivates the students to explore current research areas in the same field.

## Course Contents:

### Module I

Uses computer networks, Reference Models, TCP/IP suite of protocols, MAC protocols for high-speed LANS, MANs, and wireless LANs. (For example, FDDI, DQDB, HIPPI, Gigabit Ethernet, Wireless Ethernet, etc.)Fast access technologies. (For example, ADSL, Cable Modem, etc.)

### Module II:

Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internet Working, Network Layer in Internet.  
IPv6 basic protocol, extensions and options, support for QoS, security, etc., Changes to other protocols, Application Programming Interface for IPv6.

### Module III

Mobile IP, IP Multicasting. Multicast routing protocols, address assignments, session discovery, etc.

### Module IV

The Transport Protocol: The Transport Service, Elements of transport protocol, a simple Transport Protocol, Internet Transport Protocols UDP, Internet Transport Protocols TCP, TCP extensions for high-speed networks, transaction-oriented applications Performance Issues.  
The Application Layer: DNS-(Domain Name System), Electronic Mail, World Wide Web Multimedia.

### Module V

Overview of network security, Secure-HTTP, SSL, ESP, Key distribution protocols. Digital signatures, digital certificates-mail Security, Web security, Social Issues.

## Examination Scheme:

Components	A	CT	H	V/S/Q	EE
Weightage (%)	5	20	10	15	50

## Text & References:

### Text:

- Computer Networks - Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
- Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

### References:

- Computer Communications and Networking Technologies –Michael A.Gallo, William M .Hancock - Thomson Publication.
- W. Stallings. Cryptography and Network Security: Principles and Practice, 2nd Edition, Prentice Hall, 1998.
- W. R. Stevens. TCP/IP Illustrated, Volume 1: The protocols, Addison Wesley, 1994.
- C. E. Perkins, B. Woolf, and S. R. Alpert. Mobile IP: Design Principles and Practices, Addison Wesley, 1997.

# SOFT COMPUTING

**Course Code: MTC 204**

**Credit Units: 03**

## **Course Objective:**

To develop semantic-based and context-aware systems to acquire, organise, process, share and use the knowledge embedded in multimedia content. Research will aim to maximise automation of the complete knowledge lifecycle and achieve semantic interoperability between Web resources and services.

## **Course Contents:**

### **Module I: Soft Computing**

Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing. Artificial Intelligence : Introduction, Various types of production systems, characteristics of production systems, breadth first search, depth first search techniques, other Search Techniques like hill Climbing, Best first Search, A\* algorithm, AO\* Algorithms and various types of control strategies. Knowledge representation issues, Propositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning, Weak & Strong Slot & filler structures, NLP.

### **Module II: Neural Network**

Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm, Linear separability, Widrow & Hebb's learning rule/Delta rule, ADALINE, MADALINE, AI v/s ANN. Introduction of MLP, different activation functions, Error back propagation algorithm, derivation of BBPA, momentum, limitation, characteristics and application of EBPA

### **Module III**

Counter propagation network, architecture, functioning & characteristics of counter Propagation network, Hopfield/ Recurrent network, configuration, stability constraints, associative memory, and characteristics, limitations and applications. Hopfield v/s Boltzman machine. Adaptive Resonance Theory: Architecture, classifications, Implementation and training. Associative Memory.

### **Module IV: Fuzzy Logic**

Fuzzy set theory, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Fuzzy systems: crisp logic, fuzzy logic, introduction & features of membership functions, Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

### **Module V: Genetic algorithm**

Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

## **Examination Scheme:**

Components	CT	H	V/S/Q	AT	EE
Weightage (%)	5	20	10	15	50

## **Text & References:**

- S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & Applications, PHI Publication.
- S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications
- Rich E and Knight K, Artificial Intelligence, TMH, New Delhi.
- Bose, Neural Network fundamental with Graph , Algo.& Appl, TMH
- Kosko: Neural Network & Fuzzy System, PHI Publication
- Klir & Yuan, Fuzzy sets & Fuzzy Logic: Theory & Appli.,PHI Pub.
- Hagen, Neural Network Design, Cengage Learning

# COMPILER DESIGN LAB

**Course Code: MTC 221**

**Credit Units: 01**

**Course Contents:**

**Programming Language: C/C++**

**Assignments:**

1. WAP to check whether string is accepted or not for entered grammar.
2. WAP to convert Infix to Postfix notation.
3. WAP to convert Infix to Prefix notation.
4. WAP to find no of Tokens in an expression.
5. WAP to convert Regular Expression to NFA.
6. WAP to convert NFA to DFA.
7. WAP to calculate LEADING and TRAILING of a grammar.
8. WAP to calculate FIRST and FOLLOW of a grammar.
9. WAP to implement shift reduce parser.
10. WAP to implement top down parser.

**Examination Scheme:**

IA				EE	
A	PR	LR	V	PR	V
5	20	15	10	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# ENTERPRISE JAVA APPLICATIONS USING J2EE LAB

**Course Code: MTC 222**

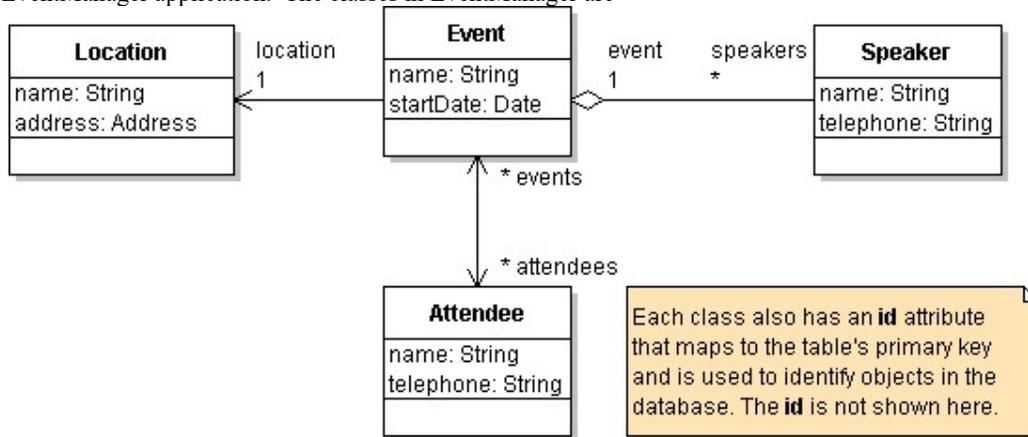
**Credit Units: 01**

**Course Contents:**

**Programming Language: JAVA**

**Assignments:**

1. Write a Program to access a table Product Master from MySql4.1 database using Java code.
2. Write a Program using Servlet to display Visitor Count.
3. Write a Program using Servlet to Differentiate between Frequent visitor and a new visitor.
4. Write a Program for authentication, which validate the login-id and password by the servlet code.
5. Write a Program to connecting a database using user-id and password.
6. Write a Program to insert data into the database using the prepared statement.
7. Write a Program to read data from the database using the ResultSet.
8. Write a Program to read data send by the client (HTML page) using servlet.
9. Write a Program to include a HTML page into a JSP page.
10. Write a Program to display httprequest Header in JSP.
11. Write a Program to handle the JSPException.
12. Write a Program to read data send by a client (HTML page) using JSP.
13. Write a Program to Develop Login Form in Struts.
14. Create an Enterprise application using Session Bean(Stateless) which convert the amount from Dollar to Rupees.
15. Write a Enterprise Session bean to simulate a income Tax Calculator.
16. Write a Entity bean to find a student record in student data base using primary key property.
17. Write a XML DTD document to validate and authenticate Student Details.
18. Create an XML version of the citations, Create an XML Schema that will be used to validate the XML, Create an XSL Stylesheet that will transform the citations data into HTML.
19. Write a Program to query record based on primary key using Hibernate.
20. Write a Program using Hibernate to develop classes and Hibernate configuration to persist an EventManager application. The classes in EventManager are



**Examination Scheme:**

IA				EE	
A	PR	LR	V	PR	V
5	20	10	15	25	25

**Note:** IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

## ADVANCED COMPUTER NETWORKS LAB

**Course Code:** MTC 223

**Credit Units: 01**

**Course Contents:**

Various installations and connections of LAN, WAN, ETC

**Examination Scheme:**

IA				EE	
A	PR	LR	V	PR	V
5	20	15	10	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# MINOR PROJECT

**Course Code: MTC 260**

**Credit Units: 05**

## **GUIDELINES FOR PROJECT FILE AND PROJECT REPORT**

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation. Research is genuine exploration of the unknown that leads to new knowledge which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critically analyzed by the faculty guide and corrected by the student at each stage.

## **PROJECT FILE**

The Project File may be a very useful tool for undertaking an assignment along-with a normal semester, an exploratory study, sponsored projects, a project undertaken during summer period or any other period where the researcher is not working with a company/organization. The project/ assignment may also be a part of the bigger research agenda being pursued by a faculty/ institution/ department

The Project File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation. This file may be considered in continuous assessment.

### **In general, the File should be comprehensive and include:**

A short account of the activities that were undertaken as part of the project;

A statement about the extent to which the project has achieved its stated objectives;

A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;

Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;

Any problems that have arisen and may be useful to document for future reference.

## **Project Report**

The Project Report is the final research report that the student prepares on the project assigned to him. In case of sponsored project the lay out of the project could be as prescribed by the sponsoring organization. However, in other cases the following components should be included in the project report:

### **Title or Cover Page**

The title page should contain Project Title; Student's Name; Programme; Year and Semester and Name of the Faculty Guide.

### **Acknowledgement(s)**

Acknowledgment to any advisory or financial assistance received in the course of work may be given. It is incomplete without student's signature.

### **Abstract**

A good "Abstract" should be straight to the point; not too descriptive but fully informative. First paragraph should state what was accomplished with regard to the objectives. The abstract does not have to be an entire summary of the project, but rather a concise summary of the scope and results of the project. It should not exceed more than 1000 words.

### **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

### **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

### **Materials and Methods**

This section should aim at experimental designs, materials used (wherever applicable). Methodology should be mentioned in details including modifications undertaken, if any. It includes organization site(s), sample, instruments used with its validation, procedures followed and precautions.

## Results and Discussion

Present results, discuss and compare these with those from other workers, etc. In writing this section, emphasis should be laid on what has been performed and achieved in the course of the work, rather than discuss in detail what is readily available in text books. Avoid abrupt changes in contents from section to section and maintain a lucid flow throughout the thesis. An opening and closing paragraph in every chapter could be included to aid in smooth flow.

Note that in writing the various sections, all figures and tables should as far as possible be next to the associated text, in the same orientation as the main text, numbered, and given appropriate titles or captions. All major equations should also be numbered and unless it is really necessary, do not write in “point” form.

While presenting the results, write at length about the various statistical tools used in the data interpretation. The result interpretation should be simple but full of data and statistical analysis. This data interpretation should be in congruence with the written objectives and the inferences should be drawn on data and not on impression. Avoid writing straight forward conclusion rather, it should lead to generalization of data on the chosen sample.

Results and its discussion should be supporting/contradicting with the previous research work in the given area. Usually one should not use more than two researches in either case of supporting or contradicting the present case of research.

## Conclusion(s) & Recommendations

A conclusion should be the final section in which the outcome of the work is mentioned briefly.

Check that your work answers the following questions:

- Did the research project meet its aims (check back to introduction for stated aims)?
- What are the main findings of the research?
- Are there any recommendations?
- Do you have any conclusion on the research process itself?

## Implications for Future Research

This should bring out further prospects for the study either thrown open by the present work or with the purpose of making it more comprehensive.

## Appendices

The Appendices contain material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

## References

References should include papers, books etc. referred to in the body of the report. These should be written in the alphabetical order of the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

## Examples

### For research article

Voravuthikunchai SP, Lortheeranuwat A, Ninprom T, Popaya W, Pongpaichit S, Supawita T. (2002) Antibacterial activity of Thai medicinal plants against enterohaemorrhagic *Escherichia coli* O157: H7. *Clin Microbiol Infect*, 8 (suppl 1): 116–117.

### For book

Kowalski, M. (1976) Transduction of effectiveness in *Rhizobium meliloti*. SYMBIOTIC NITROGEN FIXATION PLANTS (editor P.S. Nutman IBP), 7: 63-67

## The Layout Guidelines for the Project File & Project Report

- A4 size Paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top and bottom margins: 1 inch/ 2.5 cm; left and right margins: 1.25 inches/ 3 cm

## ASSESSMENT OF THE PROJECT FILE AND THE PROJECT REPORT

Essentially, the assessment will be based on the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The Project should fulfill the following *assessment objectives*

- Range of Research Methods used to obtain information
- Execution of Research
- Data Analysis (Analyze Quantitative/ Qualitative information)
- Quality Control
- Conclusions

**Assessment Scheme:**

**Continuous Evaluation:** 40% (Based on punctuality, regularity of work, adherence to plan and methodology, refinements/ mid-course corrections etc. as reflected in the Project File.)

**Final Evaluation:** 60% (Based on the Documentation in the file, Final report layout, analysis and results, achievement of objectives, presentation/ viva)

# CLOUD COMPUTING

**Course Code: MTC 205**

**Credit Units: 03**

## **Course Objective:**

Cloud Computing is considered one of the top five emerging technologies that will have a major impact on the quality of science and society over next 20 years. It provides a way to centralize the setup, implementation, maintenance, and management of integrated computation services to individual and corporate end users.

The objective of this course is to provide graduate students with the comprehensive knowledge of Cloud Computing concepts, technologies, architecture and applications by introducing and researching state-of-the-art in Cloud Computing fundamental issues, technologies, applications and implementations. Another objective is to expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research.

## **Course Contents:**

### **Module I: Systems Modeling, Clustering and virtualization:**

Scalable Computing over the Internet, Technologies for Network based systems, System models for Distributed and Cloud Computing, Software environments for distributed systems and clouds, Performance, Security and Energy Efficiency

### **Module II: Virtual Machines and Virtualization of Clusters and Data Centers:**

Implementation Levels of Virtualization, Virtualization Structures/ Tools and mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization for Data Center Automation.

### **Module III: Cloud Platform Architecture:**

Cloud Computing and service Models, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, Inter Cloud Resource Management, Cloud Security and Trust Management. Service Oriented Architecture, Message Oriented Middleware.

### **Module IV: Cloud Programming and Software Environments:**

Features of Cloud and Grid Platforms, Parallel & Distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

### **Module V: Cloud Resource Management and Scheduling:**

Policies and Mechanisms for Resource Management Applications of Control Theory to Task Scheduling on a Cloud, Stability of a Two Level Resource Allocation Architecture, Feedback Control Based on Dynamic Thresholds. Coordination of Specialized Autonomic Performance Managers, Resource Bundling, Scheduling Algorithms for Computing Clouds, Fair Queuing, Start Time Fair Queuing, Borrowed Virtual Time, Cloud Scheduling Subject to Deadlines, Scheduling MapReduce Applications Subject to Deadlines.

### **Module VI: Storage Systems:**

Evolution of storage technology, storage models, file systems and database, distributed file systems, general parallel file systems. Google file system., Apache Hadoop, BigTable, Megastore, Amazon Simple Storage Service(S3)

## **Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## **Text & References:**

### *Text:*

- Distributed and Cloud Computing, Kai Hwang, Geoffrey C. Fox, Jack J. Dongarra MK Elsevier.
- Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
- Cloud Computing, A Hands on approach, Arshadeep Bahga, Vijay Madisetti, University Press

### *References:*

- Cloud Computing, A Practical Approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, TMH
- Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christen vecctiola, S Tammarai selvi, TMH

# ADVANCED COMPUTER ORGANIZATION

**Course Code:** MTC 206

**Credit Units:** 03

## Course Objective:

The Objective of this course is to expose the students to the fundamentals and the concepts of Digital & Computer Organization and Representation of Information and Basic Building Blocks, Basic Organization, Memory Organization, Input-Output Organization, Processor Organization etc. This course is designed to understand the concepts of Computer Organization for Research & Development as well as for application.

## Course Contents:

### Module I

Overview of Parallel computing, Parallelism in Uniprocessor Systems, Parallel computer structures, Pipeline computers, Array computers, Multiprocessor system, Dataflow computers. Architectural Classification schemes, parallel processing applications.

### Module II: Pipelining Processing

An overlapped parallelism, Principal of Linear Pipelining, Classification of linear pipeline Instruction and Arithmetic pipelines.

Principles of designing pipelined processors, Internal forwarding and register tagging. Hazard detection and resolution, Job sequencing and collision prevention, Characteristics of Vector processing, Multiple vector task dispatching.

### Module III

SIMD array processor, SIMD computer organization, Masking and Data routing, SIMD Interconnection network: Static, Dynamic networks, Cube interconnection network, Shuffle exchange and Omega Network, SIMD Matrix multiplication.

### Module IV: Multiprocessor Architecture

Tightly and loosely coupled multiprocessors, Introduction to Data flow computing and flow Graph, Introduction to 8 bit and 16 bit Intel Microprocessor architecture and register set.

### Module V

Assembly language programming based on Pentiums; Instruction: Data transfer, Logic, Branch operations, Looping Counting, Indexing, Programming Technique, Counters and Time Delays, Stacks and subroutines, Conditional call and Return Instructions.

## Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## Text & References:

- Hwang and Briggs, “ Computer Architecture and parallel processing”, McGraw Hill
- R.S Goankar, “Microprocessor Architecture, programming and application with the 8085”, Pen Ram International.
- Peterson and Heresy, Quantitative approach to Computer architecture”, Morgan Kaufman.
- Hwang, “Advanced Computing Architecture”, McGraw Hill.
- Quin, “Parallel Computing, Theory and Practices”, McGraw Hill.
- Daniel Tabak, “Advanced Microprocessor”, McGraw Hill.
- Hall D.V, “Microprocessor and Interfacing, Program and hardware”

# COMPUTER ORIENTED OPERATIONAL RESEARCH

**Course Code:** MTC 207

**Credit Units:** 03

## **Course Objective:**

In a rapidly changing environment an understanding is sought which will facilitate the choice and the implementation of more effective solutions, which, typically, may involve complex interactions among people, materials and money. Organizations may seek a very wide range of operational improvements – for example, greater efficiency, better customer service, higher quality or lower cost, Whatever the business, engineering aim, Operations Research can offer the flexibility and adaptability to provide objective help. This course introduces students to the principles of operational research.

## **Course Contents:**

### **Module I: Linear Programming**

Formulation of problem. Graphical and simplex method for maximization and minimization. Duality theory and sensitivity analysis.

### **Module II: Transportation Models**

Stepping stone algorithm, MODI method and Vogel's Approximation Method (VAM) for selfing balanced, unbalanced transportation problems and problems of degeneracy and maximization.

### **Module III: Assignment Models**

Assignment model for maximization and traveling salesman problems, Industrial Problems.

### **Module IV: Queuing Theory**

Basic structured, Terminology, classification. Birth and death process. Sequencing. Processing in jobs through machines with the same processing order. Processing of 2 Jobs through machines with each having different processing order.

### **Module V: Network Models**

Introduction to PERT and CPM. Fundamental concept of Network models and construction of network diagrams, PERT activity, time estimate. Critical path and project time duration, Probability of completing the project on or before specified time. Float of a activity.

## **Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## **Text & References:**

- HM Wagner, Principles of Operations Research, Prentice Hall
- PK Gupta and DS Hira, Operations Research, S Chand & Co
- Taha, Introduction to Operation Research
- F S Hiller and G I Liebermann, Introduction to Operation Research, Holden R

## COMMUNICATION SKILLS - II

**Course Code:** BCS 211

**Credit Units: 01**

### **Course Objective:**

To enrich the understanding of English language and communication, structure, style, usage, and vocabulary for global business purposes.

### **Course Contents:**

#### **Module I: Fundamentals of Communication**

Role and purpose of communication: *7 C's of communication*

Barriers to effective communication

Enhancing listening

Forms of Communication: one-to-one, informal and formal

#### **Module II: Verbal Communication (Written)**

Business Letter

Social correspondence

Writing resume and Job applications

#### **Module III: Speaking skills**

Conversational English

Guidelines to give an effective presentation

Activities to include:

Presentations by students

Just a minute

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>CAF</b>	<b>V</b>	<b>GD</b>	<b>GP</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	25	10	10	10	5

CAF – Communication Assessment File

GD – Group Discussion

GP – Group Presentation

### **Text & References:**

- Business Communication, Raman – Prakash, Oxford
- Textbook of Business Communication, Ramaswami S, Macmillan
- Speaking Personally, Porter-Ladousse, Cambridge

# BEHAVIOURAL SCIENCE - II (BEHAVIOURAL COMMUNICATION AND RELATIONSHIP MANAGEMENT)

**Course Code:** BCS 211

**Credit Units: 01**

## **Course Objective:**

This course aims at imparting an understanding of:  
Process of Behavioural communication  
Aspects of interpersonal communication and relationship  
Management of individual differences as important dimension of IPR

## **Course Contents:**

### **Module I: Behavioural Communication**

Scope of Behavioural Communication  
Process – Personal, Impersonal and Interpersonal Communication  
Guidelines for developing Human Communication skills  
Relevance of Behavioural Communication in relationship management

### **Module II: Managing Individual Differences in Relationships**

Principles  
Types of issues  
Approaches  
Understanding and importance of self disclosure  
Guidelines for effective communication during conflicts

### **Module III: Communication Climate: Foundation of Interpersonal Relationships**

Elements of satisfying relationships  
Conforming and Disconfirming Communication  
Culturally Relevant Communication  
Guideline for Creating and Sustaining Healthy Climate

### **Module IV: Interpersonal Communication**

Imperatives for Interpersonal Communication  
Models – Linear, Interaction and Transaction  
Patterns – Complementary, Symmetrical and Parallel  
Types – Self and Other Oriented  
Steps to improve Interpersonal Communication

### **Module V: Interpersonal Relationship Development**

Relationship circle – Peer/ Colleague, Superior and Subordinate  
Initiating and establishing IPR  
Escalating, maintaining and terminating IPR  
Direct and indirect strategies of terminating relationship  
Model of ending relationship

### **Module VI: End-of-Semester Appraisal**

Viva based on personal journal  
Assessment of Behavioural change as a result of training  
Exit Level Rating by Self and Observer

## **Examination Scheme:**

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

## **Text & References:**

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Simons, Christine, Naylor, Belinda: Effective Communication for Managers, 1997 1<sup>st</sup> Edition Cassell
- Harvard Business School, Effective Communication: United States of America
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.

# FRENCH - II

**Course Code: FLF 211**

**Credit Units: 02**

## Course Objective:

- To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French.
- To make them learn the basic rules of French Grammar.

## Course Contents:

**Module A: pp.38 – 47: Unité 3: Objectif 3, 4, 5, 6**

**Module B: pp. 47 to 75 Unité 4, 5**

### Contenu lexical:

#### Unité 3: Organiser son temps

1. donner/demander des informations sur un emploi du temps, un horaire  
SNCF – Imaginer un dialogue
2. rédiger un message/ une lettre pour ...
  - i) prendre un rendez-vous/ accepter et confirmer/ annuler
  - ii) inviter/accepter/refuser
3. Faire un programme d'activités  
imaginer une conversation téléphonique/un dialogue  
Propositions- interroger, répondre

#### Unité 4: Découvrir son environnement

1. situer un lieu
2. s'orienter, s'informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie

#### Unité 5: s'informer

1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s'informer

### Contenu grammatical:

1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l'aide de:
  - i. « de »
  - ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative -  
construction à l'infinitif
4. Impératif/exprimer l'obligation/l'interdiction à l'aide de « il faut... »/ « il ne faut pas... »
5. passé composé
6. Questions directes/indirectes

## Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

## Text & References:

- le livre à suivre: Campus: Tome 1

# GERMAN – II

**Course Code: FLG 211**

**Credit Units: 02**

## **Course Objective:**

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Introduction to Grammar to consolidate the language base learnt in Semester I

## **Course Contents:**

### **Module I: Everything about Time and Time periods**

Time and times of the day.

Weekdays, months, seasons.

Adverbs of time and time related prepositions

### **Module II: Irregular verbs**

Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

### **Module III: Separable verbs**

To comprehend the change in meaning that the verbs undergo when used as such

Treatment of such verbs with separable prefixes

### **Module IV: Reading and comprehension**

Reading and deciphering railway schedules/school time table

Usage of separable verbs in the above context

### **Module V: Accusative case**

Accusative case with the relevant articles

Introduction to 2 different kinds of sentences – Nominative and Accusative

### **Module VI: Accusative personal pronouns**

Nominative and accusative in comparison

Emphasizing on the universal applicability of the pronouns to both persons and objects

### **Module VII: Accusative prepositions**

Accusative prepositions with their use

Both theoretical and figurative use

### **Module VIII: Dialogues**

Dialogue reading: 'In the market place'

'At the Hotel'

## **Examination Scheme:**

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

## **Text & References:**

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

## SPANISH – II

**Course Code:** FLS 211

**Credit Units: 02**

### **Course Objective:**

To enable students acquire more vocabulary, grammar, Verbal Phrases to understand simple texts and start describing any person or object in Simple Present Tense.

### **Course Contents:**

#### **Module I**

Revision of earlier modules.

#### **Module II**

Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

#### **Module III**

More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs (*bueno/malo, muy, mucho, bastante, poco*). Simple texts based on grammar and vocabulary done in earlier modules.

#### **Module IV**

Possessive pronouns

#### **Module V**

Writing/speaking essays like my friend, my house, my school/institution, myself...descriptions of people, objects etc, computer/internet related vocabulary

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

### **Text & References:**

- Español, En Directo I A
- Español Sin Fronteras

# CHINESE – II

**Course Code: FLC 211**

**Credit Units: 02**

## **Course Objective:**

Chinese is a tonal language where each syllable in isolation has its definite tone (flat, falling, rising and rising/falling), and same syllables with different tones mean different things. When you say, “ma” with a third tone, it mean horse and “ma” with the first tone is Mother. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

## **Course Contents:**

### **Module I**

Drills  
Practice reading aloud  
Observe Picture and answer the question.  
Tone practice.  
Practice using the language both by speaking and by taking notes.  
Introduction of basic sentence patterns.  
Measure words.  
Glad to meet you.

### **Module II**

Where do you live?  
Learning different colors.  
Tones of “bu”  
Buying things and how much it costs?  
Dialogue on change of Money.  
More sentence patterns on Days and Weekdays.  
How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end ..... etc.  
Morning, Afternoon, Evening, Night.

### **Module III**

Use of words of location like-li, wai, hang, xia  
Furniture – table, chair, bed, bookshelf,.. etc.  
Description of room, house or hostel room.. eg what is placed where and how many things are there in it?  
Review Lessons – Preview Lessons.  
Expression ‘yao’, ‘xiang’ and ‘yaoshi’ (if).  
Days of week, months in a year etc.  
I am learning Chinese. Is Chinese difficult?

### **Module IV**

Counting from 1-1000  
Use of “chang-chang”.  
Making an Inquiry – What time is it now? Where is the Post Office?  
Days of the week. Months in a year.  
Use of Preposition – “zai”, “gen”.  
Use of interrogative pronoun – “duoshao” and “ji”.  
“Whose”??? Sweater etc is it?  
Different Games and going out for exercise in the morning.

### **Module V**

The verb “qu”  
Going to the library issuing a book from the library  
Going to the cinema hall, buying tickets  
Going to the post office, buying stamps  
Going to the market to buy things.. etc  
Going to the buy clothes .... Etc.  
Hobby. I also like swimming.  
Comprehension and answer questions based on it.

**Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

**Text & References:**

- “Elementary Chinese Reader Part I” Lesson 11-20

# DATA WAREHOUSING AND DATA MINING

**Course Code: MTC 301**

**Credit Units: 03**

## **Course Objective:**

To demonstrate new concepts of organizing data ware house & data mining technique to drive the useful information out of the piles of data. This course will expose students to the process of extracting patterns from large data sets by combining methods from statistics and artificial intelligence with database management

## **Course Contents:**

### **Module I: Data Warehousing**

An Introduction to data ware housing and characteristics of a data warehouse, various aspects of data marts. Data warehouse logical design: star schemas, fact tables, dimensions, other schemas, materialized, views, Data warehouse physical design: hardware and i/o considerations, parallelism, indexes.

### **Module II: On Line Analytical processing**

OLTP and OLAP systems, Data Modelling, OLAP Tools, web OLAP, Decision support system. Developing a Data Ware house: Architectural strategies and Organization Issues, Design Considerations, Tools for Data Warehousing,

### **Module III: Data Mining**

Data mining approaches and methods: concept description, classification, association rules, clustering, Mining complex types of data, Research trends in data warehousing and data mining. Objectives of Data Mining the Technical context for Data Mining, machine learning, decision support and computer technology.

### **Module IV: Data Mining Techniques and Algorithms**

Process of data mining, Algorithms, Data base segmentation or clustering, predictive Modelling, Link Analysis, Data Mining Techniques, Automatic Cluster Detection, Decision trees and Neural Networks.

## **Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>S/V/Q</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination. Att: Attendance

## **Text & References:**

### **Text:**

- “Mastering Data Mining: The Art and Science of Customer Relationship Management”, by Berry and Lin off, John Wiley and Sons, 2001.
- “Data Ware housing: Concepts, Techniques, Products and Applications”, by C.S.R. Prabhu, Prentice Hall of India, 2001.

### **References:**

- “Data Mining: Concepts and Techniques”, J.Han, M.Kamber, Academic Press, Morgan Kanf man Publishers, 2001.
- “Data Mining”, by Pieter Adrians, Dolf Zantinge, Addison Wesley, 2000.
- “Data Mining with Microsoft SQL Server”, by Seidman, Prentice Hall of India, 2001.

# NETWORK SECURITY AND MANAGEMENT

**Course Code:**

**MTC 302**

**Credit Units: 03**

## **Course Objective:**

The objective of this course is to identify the different network security measures and to analyze each of them. To study protocols, issues related to implementation of network security.

## **Course Contents:**

### **Module I**

Classical Cryptography, Various types of Cipher, Cryptanalysis, Computer Security, Threats to security, History of Computer security, Computer System Security and Access Controls (System access and data access). Threats - Viruses, worms, Trojan horse, bombs, trap doors, spoofs, email virus, macro Viruses, remedies, Intruders, Malicious software, Firewalls, vulnerabilities & Threats, Network Denial of service attack.

### **Module II**

Technologies - Switching Design, Switching Types - Layer 2 and 3 Switching, Spanning Tree Protocol, Redundancy in Layer 2 Switched Networks, STP Terminology and Operation, Virtual LANs – Trunks - Inter-VLAN Routing - Multilayer Switching, Switching Security and Switching Design Considerations IPv4 Routing Design.

IPv4 Address Design - Private and Public Addresses – NAT - Subnet Masks - Hierarchical IP Address Design - IPv4 Routing Protocols – Classification - Metrics - Routing Protocol Comparison - IPv4 Routing Protocol Selection.

### **Module III**

Network Security Design, Hacking – Vulnerabilities - Design Issues - Human Issues - Implementation Issues – Threats - Reconnaissance Attacks - Access Attacks - Information Disclosure Attacks - Denial of Service Attacks - Threat Defense - Secure Communication - Network Security Best Practices - SAFE Campus Design.

### **Module IV**

Network Security-Kerberos, X.509, some network security projects- SDNS, DISNet, Project MAX, Secure NFS Security- E-Mail Security, IP security, Web security, Server security- security for network server, web servers, mobile technologies (java and Java script etc)

### **Module V**

Network Management Design: ISO Network Management Standard - Protocols and Tools – SNMP – MIB – RMON - Cisco NetFlow – Syslog – CiscoWorks - Network Management Strategy - SLCs and SLAs - IP Service-Level Agreements – Content Networking Design – Case Study – Venti Systems.

## **Examination Scheme:**

<b>Components</b>	<b>A</b>	<b>CT</b>	<b>S/V/Q</b>	<b>HA</b>	<b>EE</b>
<b>Weightage (%)</b>	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## **Text & References:**

### **Text:**

- Computer Security, Dieter Gouman, John Wiley & Sons
- Craig Zacker, “The Complete Reference: Upgrading and Troubleshooting Networks”, Tata McGraw-Hill, 2000.

### **References:**

- Computer Security: Art and Science, Mathew Bishop, Addison-Wisley
- Introduction to computer Security- Mathew Bishop, Addison-Wisley
- Network security, Kaufman, Perlman and Speciner, Pearson Education
- Cryptography and Network Security, William Stallings, Pearson Education
- Diane Tiare and Catherine Paquet, “Campus Network Design Fundamentals”, Pearson Education, 2006.

# DATA WAREHOUSING AND DATA MINING LAB

**Course Code:** MTC 321

**Credit Units: 01**

## **Course Contents:**

**Software Required:** Informatica Tool, Cognos, Todd.

## **Assignments:**

1. Write a program to implement text mining.
2. Write a program to implement web mining.
3. Write a program to develop snowflake schema.
4. Write a program to develop the tree schema with the help of binary tree.
5. Write a program to implement BFS and DFS with respect to 2-D modeling.
6. Write a program to implement the basic step of informatics tool.
7. Write a Program to implement the K-means algorithm
8. Write a Program to implement PAM K-medoids algorithm
9. Write a Program to implement AGNES hierarchical clustering
10. Do the compare between K-Means, K-Medoid, hierarchical clustering Results

## **Examination Scheme:**

IA				EE	
A	PR	LR	V	PR	V
5	20	15	10	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

**DISSERTATION (Evaluation of Plan and Critical Literature Review)**

**Course Code:**

**MTC 360**

**Credit Units: 03**

# PATTERN RECOGNITION AND IMAGE PROCESSING

**Course Code: MTC 303**

**Credit Units: 03**

## **Course Objective:**

This course covers the theory and methods for learning from data, with an emphasis on pattern classification. Digital Image Processing is designed to give professionals and students a powerful collection of fundamental and advanced image processing tools on the desktop

## **Course Contents:**

### **Module I: Introduction**

Machine perception, pattern recognition example, pattern recognition systems, the design cycle, learning and adaptation

### **Bayesian Decision Theory**

Introduction, continuous features – two categories classifications, minimum error-rate classification- zero-one loss function, classifiers, discriminant functions, and decision surfaces

### **Module II:**

Normal density:

Univariate and multivariate density, discriminant functions for the normal density-different cases, Bayes decision theory – discrete features, compound

Bayesian decision theory and context

### **Module III: Un-supervised learning and clustering**

Introduction, mixture densities and Identifiability, maximum likelihood estimates, application to normal mixtures, K-means clustering. Data description and clustering, similarity measures, criteria function for clustering

### **Module IV: Image Fundamentals and Transforms**

Elements of visual perception – Image sampling and quantization, Basic relationship between pixels, Some basic grayscale transformations, Introduction to Fourier Transform and DFT, Properties of 2D Fourier Transform, FFT, Separable Image Transforms, Walsh, Hadamard, Discrete Cosine Transform, Haar, Slant, Karhunen, Loeve transforms.

### **Module V: Image Segmentation and Edge Detection:**

Region Operations, Crack Edge Detection,

Edge Following, Gradient operators, Compass and laplace operators. Threshold detection methods, optimal thresholding, multispectral thresholding, thresholding in hierarchical data structures; edge based image segmentation- edge image thresholding, edge relaxation, border tracing, border detection,

## **Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

## **Text & References:**

### **Text:**

- “*Fundamentals of speech Recognition*”, Lawrence Rabiner, Biing – Hwang Juang Pearson education.
- “*Pattern classifications*”, Richard O. Duda, PeterE. Hart, David G. Stroke. Wiley student edition, Second Edition.
- R.C Gonzalez and R.E. Woods, “*Digital Image Processing*”, Addison Wesley.

### **References:**

- “Pattern Recognition and Image Analysis” – Earl Gose, Richard John baugh, Steve Jost
- A.K.Jain, “Fundamentals of Digital Image Processing”, Prentice Hall of India.
- “Digital Image Processing”– M. Anji Reddy, BS Publications.

# PATTERN RECOGNITION AND IMAGE PROCESSING LAB

**Course Code: MTC 323**

**Credit Units: 01**

## Course Contents:

1. Study of functions in MATLAB.
2. Linear and Non-linear operations on Images.
3. Implementation of different geometric transformations (Scaling, Rotation, Translation, Shear).
4. Implementation of Identity transformation, Contrast Stretching, Threshold and Log Transformation.
5. Plotting of Histogram for Low contrast, High Contrast, Blurred Images, Black & white images and Gray Images.
6. Smoothing and Sharpening of Images using spatial filters.
7. Implementation of Fourier Transformation of different types of Images.
8. Implementation of Edge detection in different-2 images.
9. Implementation of clustering.
- 10 Implementation of different algorithms in pattern recognition.

## Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	20	15	10	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

## Text & References:

- Rafael C. Gonzalez & Richard E. Woods, “Image Processing Using MATLAB”, 2<sup>nd</sup> edition, Pearson Education.
- “Pattern classifications”, Richard O. Duda, PeterE. Hart, David G. Stroke. Wiley student edition, Second Edition

# ASP .NET

**Course Code:** MTC 304

**Credit Units: 03**

## **Course Objective:**

To create web based applications using ASP.NET.

## **Course Contents:**

### **Module I: Introduction to .NET technologies**

Features of .NET, .NET Framework, CLR, MSIL, .NET class library, .NET Languages, CTS, assemblies, manifest, and metadata, What is ASP.NET?, Difference between ASP and ASP.NET.

### **Module II: Controls in ASP.NET**

Overview of Dynamic Web page, Understanding ASP.NET Controls, Applications, Web servers, Installation of IIS. Web forms, web form controls -server controls, client controls. Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, validation Controls: Required Field Comparison Range. Calendarcontrol, Ad rotator Control, Internet Explorer Control.

### **Module III: Overview of ADO.NET and XML**

What is ADO.NET, from ADO to ADO.NET. ADO.NET architecture, Accessing Data using Data Adapters and Datasets, using Command & Data Reader, binding data to data bind Controls, displaying data in data grid, XML basics, attributes, fundamental XML classes: Document, text writer, text reader. XML validations, XML in ADO.NET, The XML Data Document.

### **Module IV: ASP.NET Applications**

Creating, tracking, caching, error handling, Securing ASP.NET applications- form based applications, window based application.

### **Module V: Web services**

Introduction, State management- View state, Session state, Application state, Building ASP.NET web services, working with ASP.NET applications, creating custom controls.

## **Examination Scheme:**

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## **Text & References:**

### **Text:**

- ASP.NET Unleashed by Stephen Walther, SAMS publications

### **References:**

- ASP.NET, Wrox Publications
- ASP.NET and VB.NET, Wrox Publication
- ASP.NET and C#.NET, Wrox publication.

## ASP.NET LAB

**Course Code: MTC 324**

**Credit Units: 01**

### Course Contents:

- Use of Controls in creating web pages
- Creating sessions
- Creating Custom controls
- Implementing security

### Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	20	15	10	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# REAL TIME OPERATING SYSTEM

**Course Code:** MTC 305

**Credit Units:** 04

## Course Objective:

The purpose of this course is to develop in-depth skills in Real Time Operating Systems. At the end of the course, student should be able to review concepts of Operating Systems, Real Time Models and Languages, Introduction to Real Time Kernels and case studies of various Real time OS

## Course Contents:

### Module I

Introduction to Real Time Systems, Priorities, Embedded Systems, Task, Classification & Requirements, Deadlines, Soft, Hard.

### Module II

Firm Real Time Systems, Introduction to Real Time Operating Systems, Basic Principles, system calls, Files, Processes, Design and implementation of processes, Communication between processes, operating system structures. Task Management, Inter Process Communication, Case Studies of Maruti II, HART OS, VRTX etc. Comparison and Study of RTOS -VxWorks and  $\mu$ CoS, Introduction to POSIX and OSEK standards, Principles, Polled loop systems, RTOS porting to a target.

### Module III

Characterizing Real Time Systems and Task, Task Assignment & Scheduling Theory, Fixed and Dynamic Priority Scheduling, Uniprocessor (RM and EDF), Multiprocessor (Utilization Balancing, Next-fit for RM & Bin-Packing Assignment for EDF) Scheduling

### Module IV

Event based, Process based, Graph models, Petrinet models, RTOS tasks, RT scheduling, Interrupt processing, Synchronization, Control blocks, Memory requirements.

### Module V

Fault, Fault Classes, Fault Tolerant Real Time System, Clocks, Clock Synchronization, Issues in Real Time Software Design.

## Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## Text & References:

- Krishna, C.M, "Real Time Systems", McGraw Hill
- Jane W.S. Liu, "Real Time Systems", Pearson Education Asia
- Levi and Agarwal, "Real Time Systems", McGraw Hill
- Mathi & Joseph, "Real Time System: Specification, Validation & Analysis", PHI
- Hermann K, "Real time systems-design principles for distributed embedded Applications", kluwer academic, 1995.
- Charles Crowley "operating systems- A design oriented approach" McGraw Hill.
- RAJ BUHR, DL Beily, "An introduction to real time systems" PHI, 1999.
- CM Krishna, Kang G. Shin, "Real time Systems", Mc Graw Hill, 1997.
- Raymond J.A., Donald L Baily, "An introduction to real time operating systems" PHI, 1999.

# MOBILE COMPUTING

**Course Code: MTC 306**

**Credit Units: 04**

## Course Objective:

The objective of this subject is to make students familiar about the basic concepts mobile technology, computing and market

## Course Contents:

### Module I: Introduction

Wireless Networks, Wireless VS Wired Networks, Mobile Devices, Mobile Applications, Challenges in mobile computing, coping with uncertainties, resource poorness, bandwidth, etc. Cellular architecture, co-channel interference, frequency reuse, capacity increase by cell splitting, GSM Architecture, GSM-Air Interface, protocols, localization & calling.

### Third Generation (3G) Mobile Services

Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

**General Packet Radio Services (GPRS):** GPRS Architecture, GPRS Network Nodes.

### Module II: (Wireless) Medium Access Control

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

**Mobile Network Layer:** Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

**Mobile Transport Layer:** Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

### Module III: Database Issues

Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and transactional models, query processing, recovery, and quality of service issues.

**Data Dissemination:** Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

**Context Aware Computing:** Ubiquitous computing, concept of context, context aware computing and applications, middleware support.

**Mobile Middleware:** Service discovery, adaptation, mobile agents.

### Module IV: Mobile Data Communication

W LANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

**Wireless Application Protocol (WAP):** The Mobile Internet standard, WAP Gateway and Protocols, wireless mark up Languages (WML).

**Wireless Local Loop (WLL):** Introduction to WLL Architecture, wireless Local Loop Technologies.

### Module V: Global Mobile Satellite Systems

Mobile Satellite Systems (GEO, MEO and LEO), case studies of the IRIDIUM and GLOBALSTAR systems. GPS.

**Wireless Enterprise Networks:** Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols.

**Mobile Ad hoc Networks (MANETs):** Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, Wireless sensor Network, wireless Security.

## Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	20	10	15	50

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

## Text & References:

### Text:

- "Wireless and Mobile Networks Architectures", by Yi-Bing Lin & Imrich Chlamtac, John Wiley & Sons, 2001.
- "Mobile and Personal Communication systems and services", by Raj Pandya, Prentice Hall of India, 2001.

***References:***

- “Guide to Designing and Implementing wireless LANs”, by Mark Ciampa, Thomson learning, Vikas Publishing House, 2001.
- “Wireless Web Development”, Ray Rischpater, Springer Publishing, 2000.
- “The Wireless Application Protocol”, by Sandeep Singhal, Pearson Education Asia, 2000.
- “Third Generation Mobile Telecommunication systems”, by P. Stavronlakis, Springer Publishers, 2001.

# AD HOC AND WIRELESS SENSOR NETWORK

**Course Code:** MTC 307

**Credit Units:** 04

## Course Objective:

This is an advanced networking course designed for students with computer networks background. The goal is to provide students with a broad perspective on the active research areas in wireless ad hoc and sensor networks, and in the process leads them toward exploring their research experiences. The expectation is an interesting demo and/or a short conference/workshop paper by the end of this course. This course welcomes students from different backgrounds, reflecting the multi-disciplinary nature of ad hoc and sensor networks.

## Course Contents:

### Module I: Introduction of ad-hoc/sensor networks

Key definitions of ad-hoc/sensor networks, Advantages of ad-hoc/sensor networks, Unique constraints and challenges, Driving Applications, Traffic Profiles , Types of Ad hoc Mobile Communications, Wireless Communications/Radio Characteristics, Mobile host movement and Movability Models, Challenges facing Ad Hoc Mobile Networks.

### Module II: Ad Hoc wireless MAC protocols

Introduction, Synchronous and asynchronous MAC protocols, Problem in Ad Hoc channel access, Receiver-initiated and sender-initiated MAC protocols, Existing Ad Hoc MAC protocols, Issues in designing MAC protocols, Classifications of MAC protocols, MAC protocols, Ad Hoc Routing Protocols- Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Issues in designing routing protocols, Classifications of Routing Protocols: Proactive Routing Protocol, Reactive Routing Protocol, Hybrid Routing Protocol, Advance Routing Protocols

### Module III: Multicast routing In Ad Hoc Networks

Introduction, Issues in Designing a Multicast Routing Protocol, Operation of Multicast Routing Protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing Protocols, Tree-Based Multicast Routing Protocols, Mesh- Based Multicast Routing Protocols, Summary of Tree-and Mesh-Based Protocols - Energy-Efficient Multicasting, Multicasting with Quality of Service Guarantees, Application Dependent Multicast Routing, Comparisons of Multicast Routing Protocols.

### Module IV: Networking Sensors

Unique features, Deployment of ad-hoc/sensor network ,Sensor tasking and control, Transport layer and security protocols, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning.

### Module V: Sensor Network Platforms and Tools

Berkley Motes, Sensor network programming challenges, Embedded Operating System, Simulators Applications of Ad-Hoc/Sensor Network and Future Directions. QoS and Energy Management

## Examination Scheme:

Components	CT	H	A	V/S/Q	EE
Weightage (%)	5	20	10	15	50

## Text & References:

- Siva Ram Murthy and B.S. Manoj “Ad Hoc Wireless Networks: Architectures and Protocols”, Pearson Education.
- C.K. Toh, “Ad Hoc Mobile Wireless Networks: Protocols and Systems”, Pearson Education.
- George Aggelou, “Mobile Wireless Networks”, Tata McGraw- Hill.
- Charles E. Perkins, Ad Hoc Networking, Pearson Education.

## COMMUNICATION SKILLS - III

**Course Code:** BCS 311

**Credit Units: 01**

### **Course Objective:**

To initiate the learners with the basic mechanics of writing skills and facilitate them with the core skills required for communication in the professional world.

### **Course Contents:**

#### **Module I: Mechanics and Semantics of Sentences**

Writing effective sentences

Style and Structure

#### **Module II: Developing writing skills**

Inter - office communication: Business Letter; E mails; Netiquette

Intra – office communication: Memos, Notices, Circulars, Minutes

Report Writing

#### **Module III: Business Presentations**

Planning, design and layout of presentation

Information Packaging

Audience analysis

Audio visual aids

Speaking with confidence

Case Studies

### **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>CAF</b>	<b>V</b>	<b>GD</b>	<b>GP</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	25	10	10	10	5

CAF – Communication Assessment File

GD – Group Discussion

GP – Group Presentation

### **Text & References:**

- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.

# BEHAVIOURAL SCIENCE - III (LEADING THROUGH TEAMS)

**Course Code: BSS 311**

**Credit Units: 01**

## **Course Objective:**

This course aims to enable students to:  
Understand the concept and building of teams  
Manage conflict and stress within team  
Facilitate better team management and organizational effectiveness through universal human values.

## **Course Contents:**

### **Module I: Teams: An Overview**

Team Design Features: team vs. group  
Effective Team Mission and Vision  
Life Cycle of a Project Team  
Rationale of a Team, Goal Analysis and Team Roles

### **Module II: Team & Sociometry**

Patterns of Interaction in a Team  
Sociometry: Method of studying attractions and repulsions in groups  
Construction of sociogram for studying interpersonal relations in a Team

### **Module III: Team Building**

Types and Development of Team Building  
Stages of team growth  
Team performance curve  
Profiling your Team: Internal & External Dynamics  
Team Strategies for organizational vision  
Team communication

### **Module IV: Team Leadership & Conflict Management**

Leadership styles in organizations  
Self Authorized team leadership  
Causes of team conflict  
Conflict management strategies  
Stress and Coping in teams

### **Module V: Global Teams and Universal Values**

Management by values  
Pragmatic spirituality in life and organization  
Building global teams through universal human values  
Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc.

### **Module VI: End-of-Semester Appraisal**

Viva based on personal journal  
Assessment of Behavioural change as a result of training  
Exit Level Rating by Self and Observer

## **Examination Scheme:**

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

## **Text & References:**

- Organizational Behaviour, Davis, K.
- Hoover, Judith D. Effective Small Group and Team Communication, 2002, Harcourt College Publishers
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

# FRENCH - III

**Course Code: FLF 311**

**Credit Units: 02**

## Course Objective:

To provide the students with the know-how

- To master the current social communication skills in oral and in written.
- To enrich the formulations, the linguistic tools and vary the sentence construction without repetition.

## Course Contents:

**Module B: pp. 76 – 88 Unité 6**

**Module C: pp. 89 to103 Unité 7**

### Contenu lexical:

#### Unité 6: se faire plaisir

1. acheter: exprimer ses choix, décrire un objet (forme, dimension, poids et matières) payer
2. parler de la nourriture, deux façons d'exprimer la quantité, commander un repas au restaurant
3. parler des différentes occasions de faire la fête

#### Unité 7: Cultiver ses relations

1. maîtriser les actes de la communication sociale courante (Salutations, présentations, invitations, remerciements)
2. annoncer un événement, exprimer un souhait, remercier, s'excuser par écrit.
3. caractériser une personne (aspect physique et caractère)

### Contenu grammatical:

1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne...rien/personne/plus
4. Questions avec combien, quel...
5. expressions de la quantité
6. ne...plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec l'objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je sais que

## Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

## Text & References:

- le livre à suivre: Campus: Tome 1

# GERMAN - III

**Course Code: FLG 311**

**Credit Units: 02**

## **Course Objective:**

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

## **Course Contents:**

### **Module I: Modal verbs**

Modal verbs with conjugations and usage  
Imparting the finer nuances of the language

### **Module II: Information about Germany (ongoing)**

Information about Germany in the form of presentations or “Referat”– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

### **Module III: Dative case**

Dative case, comparison with accusative case  
Dative case with the relevant articles  
Introduction to 3 different kinds of sentences – nominative, accusative and dative

### **Module IV: Dative personal pronouns**

Nominative, accusative and dative pronouns in comparison

### **Module V: Dative prepositions**

Dative preposition with their usage both theoretical and figurative use

### **Module VI: Dialogues**

In the Restaurant,  
At the Tourist Information Office,  
A telephone conversation

### **Module VII: Directions**

Names of the directions  
Asking and telling the directions with the help of a roadmap

### **Module VIII: Conjunctions**

To assimilate the knowledge of the conjunctions learnt indirectly so far

## **Examination Scheme:**

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

## **Text & References:**

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

## SPANISH – III

**Course Code:** FLS 311

**Credit Units:** 02

### **Course Objective:**

To enable students acquire knowledge of the Set/definite expressions (idiomatic expressions) in Spanish language and to handle some Spanish situations with ease.

### **Course Contents:**

#### **Module I**

Revision of earlier semester modules

Set expressions (idiomatic expressions) with the verb *Tener, Poner, Ir...*

Weather

#### **Module II**

Introduction to *Gustar...* and all its forms. Revision of *Gustar* and usage of it

#### **Module III**

Translation of Spanish-English; English-Spanish. Practice sentences.

How to ask for directions (using *estar*)

Introduction to IR + A + INFINITIVE FORM OF A VERB

#### **Module IV**

Simple conversation with help of texts and vocabulary

En el restaurante

En el instituto

En el aeropuerto

#### **Module V**

Reflexives

### **Examination Scheme:**

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

### **Text & References:**

- Español, En Directo I A
- Español Sin Fronteras -Nivel Elemental

# CHINESE – III

**Course Code: FLC 311**

**Credit Units: 02**

## **Course Objective:**

Foreign words are usually imported by translating the concept into Chinese, the emphasis is on the meaning rather than the sound. But the system runs into a problem because the underlying name of personal name is often obscure so they are almost always transcribed according to their pronunciation alone. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

## **Course Contents:**

### **Module I**

Drills  
Dialogue practice  
Observe picture and answer the question.  
Introduction of written characters.  
Practice reading aloud  
Practice using the language both by speaking and by taking notes.  
Character writing and stroke order

### **Module II**

Measure words  
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.  
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.  
Our school and its different building locations.  
What game do you like?  
Difference between “hii” and “neng”, “keyi”.

### **Module III**

Changing affirmative sentences to negative ones and vice versa  
Human body parts.  
Not feeling well words e.g.; fever, cold, stomach ache, head ache.  
Use of the modal particle “le”  
Making a telephone call  
Use of “jiu” and “cal” (Grammar portion)  
Automobiles e.g. Bus, train, boat, car, bike etc.  
Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

### **Module IV**

The ordinal number “di”  
“Mei” the demonstrative pronoun e.g. mei tian, mei nian etc.  
use of to enter to exit  
Structural particle “de” (Compliment of degree).  
Going to the Park.  
Description about class schedule during a week in school.  
Grammar use of “li” and “cong”.  
Comprehension reading followed by questions.

### **Module V**

Persuasion-Please don't smoke.  
Please speak slowly  
Praise – This pictorial is very beautiful  
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast ... etc.  
Talking about studies and classmates  
Use of “it doesn't matter”  
Enquiring about a student, description about study method.  
Grammar: Negation of a sentence with a verbal predicate.

## **Examination Scheme:**

<b>Components</b>	<b>CT1</b>	<b>CT2</b>	<b>C</b>	<b>I</b>	<b>V</b>	<b>A</b>
<b>Weightage (%)</b>	20	20	20	20	15	5

C – Project + Presentation  
I – Interaction/Conversation Practice

**Text & References:**

- “Elementary Chinese Reader Part I, Part-2” Lesson 21-30

# DISSERTATION

**Course Code: MTC 455**

**Credit Units: 30**

## GUIDELINES FOR DISSERTATION

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation. Research is genuine exploration of the unknown that leads to new knowledge which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

### **In general, the File should be comprehensive and include**

A short account of the activities that were undertaken as part of the project;

A statement about the extent to which the project has achieved its stated goals.

A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;

Any activities planned but not yet completed as part of the DISSERTATION, or as a future initiative directly resulting from the project;

Any problems that have arisen that may be useful to document for future reference.

#### ➤ **Report Layout**

The report should contain the following components:

#### ➤ **Title or Cover Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

#### ➤ **Acknowledgements (optional)**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

#### ➤ **Abstract**

A good "Abstract" should be straight to the point; not too descriptive but fully informative. First paragraph should state what was accomplished with regard to the objectives. The abstract does not have to be an entire summary of the project, but rather a concise summary of the scope and results of the project

#### ➤ **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

#### ➤ **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

#### ➤ **Materials and Methods**

This section should aim at experimental designs, materials used. Methodology should be mentioned in details including modifications if any.

#### ➤ **Results and Discussion**

Present results, discuss and compare these with those from other workers, etc. In writing these section, emphasis should be given on what has been performed and achieved in the course of the work, rather than discuss in detail what is readily available in text books. Avoid abrupt changes in contents from section to section and maintain a lucid flow throughout the thesis. An opening and closing paragraph in every chapter could be included to aid in smooth flow.

Note that in writing the various sections, all figures and tables should as far as possible be next to the associated text, in the same orientation as the main text, numbered, and given appropriate titles or captions. All major equations should also be numbered and unless it is really necessary never write in "point" form.

#### ➤ **Conclusion**

A conclusion should be the final section in which the outcome of the work is mentioned briefly.

#### ➤ **Future prospects**

➤ **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

➤ **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

**Examples**

**For research article**

Voravuthikunchai SP, Lortheeranuwat A, Ninprom T, Popaya W, Pongpaichit S, Supawita T. (2002) Antibacterial activity of Thai medicinal plants against enterohaemorrhagic *Escherichia coli* O157: H7. *Clin Microbiol Infect*, **8** (suppl 1): 116–117.

**For book**

Kowalski, M. (1976) Transduction of effectiveness in *Rhizobium meliloti*. SYMBIOTIC NITROGEN FIXATION PLANTS (editor P.S. Nutman IBP), **7**: 63-67

**ASSESSMENT OF THE DISSERTATION FILE**

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution.

Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project.

Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following *assessment objectives*:

**Range of Research Methods used to obtain information**

**Execution of Research**

**Data Analysis**

Analyse Quantitative/ Qualitative information

Control Quality

**Draw Conclusions**

Examination Scheme:

Dissertation	50
Viva Voce	50

<b>Total</b>	<b>100</b>
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ata, leading to production of a structured report.

**Selecting the Dissertation Topic**

It is usual to give you some discretion in the choice of topic for the dissertation and the approach to be adopted. You will need to ensure that your dissertation is related to your field of specialization.

Deciding this is often the most difficult part of the dissertation process, and perhaps, you have been thinking of a topic for some time.

It is important to distinguish here between ‘dissertation topic’ and ‘dissertation title’. The topic is the specific area that you wish to investigate. The title may not be decided until the dissertation has been written so as to reflect its content properly.

Few restrictions are placed on the choice of the topic. Normally we would expect it to be:

- relevant to business, defined broadly;
- related to one or more of the subjects or areas of study within the core program and specialisation stream;
- clearly focused so as to facilitate an in-depth approach, subject to the availability of adequate sources of information and to your own knowledge;
- of value and interest to you and your personal and professional development.

## **Planning the Dissertation**

This will entail following:

- Selecting a topic for investigation.
- Establishing the precise focus of your study by deciding on the aims and objectives of the dissertation, or formulating questions to be investigated. Consider very carefully what is worth investigating and its feasibility.
- Drawing up initial dissertation outlines considering the aims and objectives of the dissertation. Work out various stages of dissertation
- Devising a timetable to ensure that all stages of dissertation are completed in time. The timetable should include writing of the dissertation and regular meetings with your dissertation guide.

## **The Dissertation plan or outline**

It is recommended that you should have a dissertation plan to guide you right from the outset. Essentially, the dissertation plan is an outline of what you intend to do, chapter wise and therefore should reflect the aims and objectives of your dissertation.

There are several reasons for having a dissertation plan

- It provides a focus to your thoughts.
- It provides your faculty-guide with an opportunity, at an early stage of your work, to make constructive comments and help guide the direction of your research.
- The writing of a plan is the first formal stage of the writing process, and therefore helps build up your confidence.
- In many ways, the plan encourages you to come to terms with the reading, thinking and writing in a systematic and integrated way, with plenty of time left for changes.
- Finally, the dissertation plan generally provides a revision point in the development of your dissertation report in order to allow appropriate changes in the scope and even direction of your work as it progresses.

## **Keeping records**

This includes the following:

- Making a note of everything you read; including those discarded.
- Ensuring that when recording sources, author's name and initials, date of publication, title, place of publication and publisher are included. (You may consider starting a card index or database from the outset). Making an accurate note of all quotations at the time you read them.
- Make clear what is a direct a direct quotation and what is your paraphrase.

## **Dissertation format**

All students must follow the following rules in submitting their dissertation.

- Front page should provide title, author, Name of degree/diploma and the date of submission.
- Second page should be the table of contents giving page references for each chapter and section.
- The next page should be the table of appendices, graphs and tables giving titles and page references.
- Next to follow should be a synopsis or abstract of the dissertation (approximately 500 words)
- Next is the 'acknowledgements'.
- Chapter I should be a general introduction, giving the background to the dissertation, the objectives of the dissertation, the rationale for the dissertation, the plan, methodological issues and problems. The limitations of the dissertation should also be hinted in this chapter.
- Other chapters will constitute the body of the dissertation. The number of chapters and their sequence will usually vary depending on, among others, on a critical review of the previous relevant work relating to your major findings, a discussion of their implications, and conclusions, possibly with a suggestion of the direction of future research on the area.
- After this concluding chapter, you should give a list of all the references you have used. These should be cross - references with your text. For articles from journals, the following details are required e.g.

Draper P and Pandyal K. 1991, The Investment Trust Discount Revisited, Journal of Business Finance and Accounting, Vol18, No6, Nov, pp 791-832.

For books, the following details are required:

Levi, M. 1996, International Financial Management, Prentice Hall, New York, 3rd Ed, 1996

- Finally, you should give any appendices. These should only include relevant statistical data or material that cannot be fitted into the above categories.

## **The Layout Guidelines for the Dissertation**

- A4 size Paper
- Font: Arial (10 points) or Times New Roman (12 points)

- Line spacing: 1.5
- Top and bottom margins: 1 inch/ 2.5 cm; left and right margins: 1.25 inches/ 3 cm

**Guidelines for the assessment of the Dissertation**

While evaluating the dissertation, faculty guide will consider the following aspects:

1. Has the student made a clear statement of the objective or objective(s).
2. If there is more than one objective, do these constitute parts of a whole?
3. Has the student developed an appropriate analytical framework for addressing the problem at hand.
4. Is this based on up-to-date developments in the topic area?
5. Has the student collected information / data suitable to the frameworks?
6. Are the techniques employed by the student to analyse the data / information appropriate and relevant?
7. Has the student succeeded in drawing conclusion form the analysis?
8. Do the conclusions relate well to the objectives of the project?
9. Has the student been regular in his work?
10. Layout of the written report.

**Assessment Scheme:**

**Continuous Evaluation:** 40%  
 (Based on Abstract, Regularity,  
 Adherence to initial plan, Records etc.)

**Final Evaluation:** Based on, 60%

Contents & Layout of the Report,	20
Conceptual Framework,	05
Objectives & Methodology and	05
Implications & Conclusions	10
Viva & Presentation	20