Master of Computer Application

FLEXILEARN
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Programme Structure

Curriculum & Scheme of Examination

2015

AMITY UNIVERSITY
CHHATTISGARH

RAIPUR

MCA

Programme Structure

FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
IFT4501	Artificial Intelligence	3	-	-	3
IFT4518	Distributed Operating System	3	-	-	3
IFT4519	. Net with C#	3	-	-	3
IFT4520	Cryptography and Network Security	3	1	-	4
Elective set with Lab: (Select any one set)					**4**
IFT4504	Advanced Database Concepts	3	-	-	4
IFT4507	Advanced Database Concepts Lab	-	-	2	
IFT4521	Digital Image Processing	3	-	-	4
IFT4522	Digital Image Processing Lab	-	-	2	
IFT4512	Data Warehousing & Data Mining	3	-	-	4
IFT4523	Data Warehousing & Data Mining Lab	-	-	2	
IFT4524	. Net with C# Lab	-	-	2	1
IFT4535	Summer Project – II (Evaluation)	-	-	-	6
Open Electives					2
	Foreign Business Language - V	2	-	-2	2
LAN4551	French -V				
LAN4552	German -V				
LAN4553	Spanish -V				
LAN4554	Russian -V				
LAN4555	Chinese -V				
LAN4556	Portuguese –V				
LAN4557	Korean-V				
LAN4558	Japanese-V				
	TOTAL				**26**

ARTIFICIAL INTELLIGENCE

Course Code: IFT4501Credit Units: 03

Course Objective:
The primary objective of this course is to provide an introduction to the basic principles, techniques, and applications of Artificial Intelligence. The emphasis of the course is on teaching the fundamentals and not on providing a mastery of specific commercially available software tools or programming environments. Upon successful completion of the course, you will have an understanding of the basic areas of artificial intelligence search, knowledge representation, learning and their applications in design and implementation of intelligent agents for a variety of tasks in analysis, design, and problem-solving. You will also be able to design and implement key components of intelligent agents of moderate complexity in Java and/or Lisp or Prolog and evaluate their performance. Graduate students are expected to develop some familiarity with current research problems and research methods in AI by working on a research or design project.

Course Contents:

Module I: Introduction
AI and its importance, AI Problem, Application area.

Module II: Problem Representations
State space representation, problem-reduction representation, production system, production system characteristics, and types of production system.

Module III: Heuristic Search Techniques
AI and search process, brute force search, depth-first search, breadth-first search, time and space complexities, heuristics search, hill climbing, best first search, A* algorithm and beam search.

Module IV: Game Playing
AI and game playing, plausible move generator, static evaluation move generator, game playing strategies, problems in game playing.

Module V: Structured Knowledge
Associative networks, frame structures, conceptual dependencies and scripts.

Module VI: Logic
Prepositional logic: syntax and semantics, First Order Predicate Logic (FOPL): Syntax and semantics, conversion to clausal form, inference rules, unification, and the resolution principles.

Module VII: Knowledge Acquisitions
Type of learning, Knowledge Acquisition, Early work in machine learning, learning by induction.

Module VIII: Expert System
Introduction to expert system, Phases of expert system, characteristics of expert system and a case study.

Module IX: Introduction to Neural Network, Fuzzy Logic, Robotics, LISP and Prolog.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

Text:
- Artificial Intelligence – II Edition, Elaine Rich, Kevin Knight TMH.

References:
- Foundations of Artificial Intelligence and Expert Systems, V S Janakiraman, K Sarukesi, P Gopalakrishan, Macmillan India Ltd.
- Introduction to AI and Expert System, Dan W. Patterson, PHI.

DISTRIBUTED OPERATING SYSTEM

Course Code:IFT4518 Credit Units: 03

Course Objective:
This Subject provides students with an in-depth knowledge about the operating system. The former treats the standard principles of single processor system, including processes, synchronization, I/O, deadlocks, Memory Management, File Management systems, security and so on. This subject covers distributed operating system in detail, including communication process, file system and memory management synchronization and so on but this time in the context of distributed systems

Course Contents:

Module I
Modes of communication, System Process, Interrupt Handling, Handlinf Systems calls, Protection of resources &Resources Management Micro-Kernal Operating System. Distributed Operating System, Issue in the design of Distributed Operating System, Overview of Computer Networks. Inter process communication, Remote Procedure calls, RPC exception handling.

Module II: Clock Synchronization
Logical clocks, Physical clocks, clock synchronization algorithms, Mutual Exclusion, Election Algorithms, Dead locks in Distributed Systems. Thrashing, Heterogeneous DSM, Resource Management (Load Balancing approach, Load Sharing approach), Process Management: process Migration, Thread.

Module III
Overview of shared memory, consistency model, Page based Distributed Shared Memory, Shared – variable Distributed Memory, Object -based Distributed Memory.

Module IV
File models, File access, File sharing, file-caching, File Replication, fault Tolerance, Network File System, (case study, Security in Distributed File system.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

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

Text & References:

- M. Beck et al Linux Kernal, Internal Addition Wesley, 1997.
- B.W. Kernighan and R Pide, The Unix Programming Environment Prentce Hall of India-2000.
- Asilbersch atz P.B Garvin Operating System Concept, John Wiley & Sons (Asia) Pte 2000.
- Cox K, "Red Hat Linux Administrator's Guide". PHI (200).

.NET WITH C#

Course Code:IFT4519Credit Units: 03

Course Contents:

Module I
C# Application Basics: Command line and VS.NET compilation. Concept of CLR and .NET
C# Fundamentals: Basic classes, declarations, conditionals, loops, arrays, strings, enumerations, structures,

Module II: OOP in C#: Encapsulation, inheritance, polymorphism, Exceptions and Object Lifetime: exceptions and the garbage collector.Interfaces, generics and collections: How and why to use them ,Callback Interfaces, Delegates, and Events

Module III
Advanced C# Type Construction: Indexers, operator overload, conversions .NET Assemblies: basic overview, Windows Forms and WPF: Basic windows programming: forms, component class, control class, control events, menus, status bars, tool bars, interacting with the registry
Drawing in Windows (GDI+): Paint sessions, the Graphics class, coordinate systems, color, fonts, hit testing.

Module IV
Input, Output, and Serialization: System.IO, Directory and File Types, StreamReaders and StreamWriters, working with binary data, configuring objects for serialization , Object Serialization: basics C# 4.0 features: Automatic properties, extension methods, partial methods, object initializers

Module V
Processes, AppDomains, Contexts, Threading, Type Reflection, Late Binding, Attribute-based programming. Data access , ADO.NET

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

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

Text & References:

- Professional ASP.NET 2.0 by Bill Evjen
- Programming in C# Balagurusamy.

CRYPTOGRAPHY AND NETWORK SECURITY

Course Code: IFT4520Credit Units: 04

Course Objective:
Network Security was always important, but has gained significance with the increase of application of Internet associated e-commerce. Threat and compromise /Breach potentially increased with the introduction of the end user involment,communication and networking .Thus the course is introduced to make the student acquainted with the concepts and practices to make the network environment secure.

Course Contents:

Module I
Introduction to security attacks, services and mechanism, Classical encryption techniquessubstitution ciphers and transposition ciphers, cryptanalysis, steganography, Stream and block ciphers. Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion, fiestal structure, Data encryption standard(DES), Strength of DES, Idea of differential cryptanalysis, block cipher modes of operations, Triple DES

Module II
Introduction to group, field, finite field of the form GF(p), modular arithmetic, prime and relative prime numbers, Extended Euclidean Algorithm, Advanced Encryption Standard (AES) encryption and decryption
Fermat's and Euler's theorem, Primality testing, Chinese Remainder theorem, Discrete Logarithmic Problem, Principals of public key crypto systems, RSA algorithm, security of RSA.

Module III
Message Authentication Codes: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions, Secure hash algorithm (SHA) Digital Signatures: Digital Signatures, Elgamal Digital Signature Techniques, Digital signature standards (DSS), proof of digital signature algorithm,

Module IV
Key Management and distribution: Symmetric key distribution, Diffie-Hellman Key Exchange, Public key distribution, X.509 Certificates, Public key Infrastructure. Authentication Applications: Kerberos

Module V
IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management. Introduction to Secure Socket Layer, Secure electronic transaction (SET). System Security: Introductory idea of Intrusion, Intrusion detection, Viruses and related threats, Firewalls.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

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

Text & References:

- William Stallings" Cryptography and Network Security: Principles and Practices" PHI
- "Applied Cryptography", Bruce Schiener.
- Bernard Menezes," Network Security and Cryptography", Cengage Learning.
- Atul Kahate, "Cryptography and Network Security", TMH.

ADVANCED DATABASE CONCEPTS

Course Code: IFT4504Credit Units: 03

Course Objective:
The purpose of this course is to provide students with a strong foundation in advanced database concepts from an industry perspective. The course covers advanced data modeling concepts like query processing, transaction and concurrency control techniques. Students also learn object-oriented and object-relational database, distributed database concepts as well as the growing relationship between databases and the World Wide Web.

Course Contents:

Module I: Query Processing
Basic concepts of query processing, converting SQL queries into Relational Algebra, Basic Algorithms for executing query operations, Query tree and query graph, Heuristic optimization of query tree.

Module II: Transaction & Concurrency Control
Basic definitions, ACID properties, schedules, Serializability of schedules, deadlocks, and concurrency control techniques, locking techniques, time-stamp based techniques, Multi-version techniques, validation techniques.

Module III: Object Oriented and Extended Relational Database Technologies
Overview of Object oriented database, OO Concepts, Encapsulation of Operations and methods, Inheritance, Object Model, Object definition language, object Query Language, Object Relational Concepts.

Module IV: Distributed Database
Introduction, Distributed databases principles, architectures, design, implementation. Fragmentation, Transparencies in Distributed Databases, Transaction control in Distributed Database, Query Processing in Distributed Database

Module V: Emerging Database Trends
Object oriented databases, Data warehousing and Data Mining, Active database, Spatial Database, Deductive database, Temporal database, Multimedia database, Distributed Database.

Examination Scheme:

Components	CT1	PR.	ATTD.	EE
Weightage (%)	10	15	5	70

Text & References:

Text:
- Fundamental of Database Systems, Elmasri & Navathe, Pearson Education, Asia
- Database System Concepts, Korth & Sudarshan, TMH

References:
- Data Base Management System, Leon & Leon, Vikas Publications
- Introduction to Database Systems, Bipin C Desai, Galgotia

ADVANCED DATABASE CONCEPTS LAB

Course Code: IFT4507Credit Units: 01

Course Contents:

- Develop Simple and Extended Entity Relationship Diagram to explain data requirement for a given Business Model
- Develop Data Flow Diagram to explain the flow and transformation of data in a given Business Model
- Work with Oracle using SQL while designing database table and performing various queries on the database.
- Use of various oracle functions to retrieve data in various form from database table
- Make SQL queries based on multiple tables of a database

1) A Private Nursing Home has hired you as a database expert to maintain information about Patients, Doctors, Treatments and other related details i.e. Medicine prescribed, lab tests recommended and Doctor's Remark given to the patient by the doctor. Justify your role as a responsible database designer by developing suitable ER Diagram and Data Flow Diagram. Also mention all possible assumptions which is helpful in producing correct database design. Draw a suitable layout for designing the Database. **[6 sessions]**

2) A Librarian has hired a database designer to maintain information about its members of library, books, library rules and other related details i.e. about issue of books, returns of books etc. You have to draw a suitable ER Diagram and Data Flow Diagram and also suggest a suitable database design to maintain above mentioned data keeping in mind redundancy and consistency of data.
                    [6 sessions]

3) A Book Publishing House has to maintain data regarding Books Published, Author's of the Books, Detail of Customers asking for books and detail of order placed by customer. Draw a suitable E R Diagram and Data Flow Diagram and also suggest a suitable database design to maintain all the above mentioned data. Make all suitable assumption for running the business process.
                    [6 sessions]

4) Examination department of the university wants to computerized the examination process and by maintaining data about students, course, date sheet of exams, Final Grade obtained by students semester wise. Draw a suitable E R Diagram and Data Flow Diagram to explain the examination process. Also draw a suitable layout for designing the database which is capable of maintaining above mentioned data.   **[6 sessions]**

5) Implement the following based on above mention business process: **[6 sessions]**
    a) Apply all possible integrity constraints into the database to maintain the integrity and consistency of data.
    b) Perform various types of SQL queries to retrieve data from multiple tables (Two or Three)
    c) Suggest and create some suitable views based on the database from one or more Tables.
    d) Use various oracle function including group functions through multiple table.
    e) Perform some select command on view created from one or more Tables

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

DIGITAL IMAGE PROCESSING

Course Code:IFT4521Credit Units: 03

Course Objective:
Processing color and grayscale images or other two-dimensional signals has become an important tool for research and investigation in many areas of science and engineering. *Digital Image Processing* is designed to give professionals and students a powerful collection of fundamental and advanced image processing tools on the desktop. Digital Image Processing takes full advantage of the computational technology of Mathematica.

Course Contents:
Module I: Introduction and Digital Image Fundamentals
The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

Module II: Image Enhancement in the Spatial Domain
Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothening and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

Module III: Image Enhancement in the Frequency Domain:
Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.
Image Restoration
A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Pereodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invarient Dedradations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations.

Module IV: Image Compression
Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of
Information Theory, Error free comparison, Lossy compression, Image compression standards.
Image Segmentation
Detection of Discontinuities, Edge linking and boundary detection, Threshold, Region Oriented Segmentation, Motion based segmentation.

Module V: Representation and Description
Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.
Object Recognition
Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods.

Examination Scheme:

Components	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

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

Text & References:
Text:
- Rafael C. Conzalez & Richard E. Woods, "Digital Image Processing", 2nd edition, Pearson Education.
- A. K. Jain, "Fundamental of Digital Image Processing", PHI.
References:
- Rosefield Kak, "Digital Picture Processing",
- W.K. Pratt, "Digital Image Processing",

DIGITAL IMAGE PROCESSING LAB

Course Code: IFT4522 Credit Units: 01

Software Required: Java

List of Assignments:

Experiments will be based on Image Representation, Image transformation, Image Enhancements, Edge Detection, Morphological Image processing and Segmentation.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

DATA WAREHOUSING AND DATA MINING

Course Code: IFT4512 Credit Units: 03

Course Objective:
This course unit is divided into two parts: one on Data Warehousing and one on Data Mining. Both data warehousing and data mining are advanced recent developments in database technology which aim to address the problem of extracting information from the overwhelmingly large amounts of data which modern societies are capable of amassing. Data warehousing focuses on supporting the analysis of data in a multidimensional way. Data mining focuses on inducing compressed representations of data in the form of descriptive and predictive models. Course gives an in-depth knowledge of both the concepts.

Course Contents:

Module I: Data Warehousing
Introduction to Data Warehouse, its competitive advantage, Data warehouse vs Operational Data, Things to consider while building Data Warehouse

Module II: Implementation
Building Data warehousing team, Defining data warehousing project, data warehousing project management, Project estimation for data warehousing, Data warehousing project implementation

Module III: Techniques
Bitmapped indexes, Star queries, Read only tablespaces, Parallel Processing, Partition views, Optimizing extraction process

Module IV: Data Mining
From Data ware housing to Data Mining, Objectives of Data Mining, the Business context for Data mining, Process improvement, marketing and Customer Relationship Management (CRM), the Technical context for Data Mining, machine learning, decision support and computer technology.

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

Module VI: Web Mining
Introduction, Classifying Web pages, extracting knowledge from the web.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

Text:
- Data Warehousing, Data Mining & OLAP, Alex Berson, Stephen J. Smith, Tata McGraw-Hill Edition 2004.
- Data Mining: Concepts and Techniques, J. Han, M. Kamber, Academic Press, Morgan Kanf man Publishers, 2001

Data Ware housing: Concepts, Techniques, Products and Applications, C.S.R. Prabhu, Prentice Hall of India, 2001.

References:
 Mastering Data Mining: The Art and Science of Customer Relationship Management, Berry and Lin off, John Wiley and Sons, 2001.
- Data Mining", Pieter Adrians, Dolf Zantinge, Addison Wesley, 2000.
 Data Mining with Microsoft SQL Server, Seidman, Prentice Hall of India, 2001.

DATA WAREHOUSING & DATA MINING LAB

Course Code: IFT4523 Credit Units: 01

Course Contents:

1. Gain insight for running pre- defined decision trees and explore results using MS OLAP Analytics.

2. Using IBM OLAP Miner – Understand the use of data mining for evaluating the content of multidimensional cubes.

3. Using Teradata Warehouse Miner – Create mining models that are executed in SQL.
(BI Portal Lab: The objective of the lab exercises is to integrate pre-built reports into a portal application)

4. Publish cognos cubes to a business intelligence portal. Metadata & ETL Lab: The objective of the lab exercises is to implement metadata import agents to pull metadata from leading business intelligence tools and populate a metadata repository. To understand ETL processes

5. Import metadata from specific business intelligence tools and populate a meta data repository.

6. Publish metadata stored in the repository.

7. Load data from heterogenous sources including text files into a pre-defined warehouse schema.

Case study
9. Design a data mart from scratch to store the credit history of customers of a bank. Use this credit profiling to process future loan applications.

10. Design and build a Data Warehouse using bottom up approach titled 'Citizen Information System'. This should be able to serve the analytical needs of the various government departments and also provide a global integrated view.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

.NET WITH C# LAB

Course Code: IFT4524   Credit Units: 01

Course Contents:

1. Write a console application that **prints your first and last name** on the console.
2. Write a program that **prints the following numbers** on the console 1, 101, 1001, each on a new line.
3. Write a program that prints on the console the **current date and time**.
4. Write a program that prints the **square root of 12345**.
5. Write a program that prints the first 100 members of the **sequence** 2, -3, 4, -5, 6, -7, 8.
6. Write a program that reads your age from the console and prints your **age after 10 years**.
7. A company dealing with marketing wants to keep a data record of its **employees**. Each record should have the following characteristic – first name, last name, age, gender ('m' or 'f') and unique employee number (27560000 to 27569999). **Declare appropriate variables** needed to maintain the information for an employee by using the appropriate data types and attribute names.
8. Declare two variables of type **int**. Assign to them values 5 and 10 respectively. **Exchange (swap) their values** and print them.
9. Write an expression that looks for a given integer if its **third digit** (right to left) is 7.
10. Write an expression that checks whether the **third bit** in a given integer is 1 or 0.
11. Write an expression that calculates the **area of a trapezoid** by given sides **a**, **b** and height **h**.
12. Write a program that prints on the console the **perimeter and the area of a rectangle** by given side and height entered by the user.
13. The gravitational field of the Moon is approximately 17% of that on the Earth. Write a program that calculates the **weight of a man on the moon** by a given weight on the Earth.
14. Write a program that gets the coefficients *a*, *b* and *c* of a quadratic equation: $a\mathbf{x}2 + b\mathbf{x} + c$, calculates and prints its real roots (if they exist). Quadratic equations may have 0, 1 or 2 real roots
15. Write a program that reads from the console number N and print the sum of the first N members of the **Fibonacci sequence**: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, …
16. Write a program that calculates **N!/K!** for given N and K (1<K<N).
17. Write a program that calculates **N!*K!/(N-K)!** for given N and K (1<K<N).
18. Write a method that returns the **English name of the last digit** of a given number. Example: for **512** prints "**two**"; for **1024** ⊐⊐"**four**".
19. Write a method that finds **how many times certain number can be found in a given array**. Write a program to test that the method works correctly.
20. Write a program, which uses a **binary search** in a **sorted** array of integer numbers to find a certain element.
21. Write a program, which prints on the standard output the **count of days, hours, and minutes, which have passes since the computer is started** until the moment of the program execution. For the implementation use the class **Environment**.
22. Write a program that reads a string, **reverse** it and prints it to the console. For example: "**introduction**" should be printed as "**noitcudortni**".
23. Define a class, which contains information about a **mobile phone**: model, manufacturer, price, owner, features of the battery (model, idle time and hours talk) and features of the screen (size and colors).
24. Declare several **constructors** for each of the classes created by the previous task, which have different lists of parameters (for complete information about a student or part of it). Data fields that are unknown have to be initialized respectively with **null** or **0**.

25. To the class of mobile phone in the previous two tasks, add a **static field iphone5**, which stores information about mobile phone model iphone5. Add a method to the same class, which displays information about this static field.
26. 11. Add an **enumeration BatteryType**, which contains the values for type of the battery (Li-Ion, NiMH, NiCd, …) and use it as a new field for the class **Battery**.

Apart from the above exercises, make program which uses the concepts of Winforms,graphical controls like button, text boxes, labels etc and delegates, assemblies, collections , event handling etc.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

SUMMER INTERNSHIP – II (EVALUATION)

Course Code: IFT4535 Credit Units: 06

Guidelines:
There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student's analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report

1. File should be in the following specification
- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components
Front Page
Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include *five sections* in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.

2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.

3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.

4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.

5. **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

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

STUDENT ASSESSMENT RECORD (SAR)

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

2. **Execution of Research**

3. **Data Analysis**
   - Analyse Quantitative/ Qualitative information
   - Control Quality

4. **Draw Conclusions**

Examination Scheme:

Components	V	S	R	FP
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report