

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DEVI AHILYA UNIVERSITY, INDORE**

MCA (6 Years)

III SEMESTER

SYLLABUS

JULY-DECEMBER 2018

Sub. Code	Sub. Name	L	T	P	C
IC-301	Probability and Statistical Methods	3	1	0	4
IC-304A	Digital Electronics	3	1	0	4
IC-305B	Data Structure and Algorithms	3	1	0	4
IC-312	Financial Accounting	3	1	0	4
IC-313	Digital Computer Organization	3	1	0	4
IC-310D	Digital Electronics Lab	0	0	4	2
IC-307C	DS and Algorithms Lab using C++	0	0	4	2
IC-309	Comprehensive Viva	0	0	0	4
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**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
DEVI AHILYA UNIVERSITY, INDORE
MCA. (6 Years) III SEMESTER
IC – 301 :- Probability and Statistical Methods**

Aim of Course : The aim of this course is to make student aware about the Probability and Statistical Methods for research and real life data analysis.

Objectives:

- Understand basic concepts of Probability and Statistical Methods for data analysis.
- Learn Hypothesis testing.
- Learn the application of different tests such as Chi-square, T & F statistic.

Course Contents:

UNIT 1

Theoretical Probability Distributions: Binomial Probability distribution, Poisson Probability distribution, Normal Probability distribution.

Estimation: Unbiased-ness, consistency, efficiency and sufficiency , minimum variance unbiased estimator , Cramer-Rao inequality and its application , Maximum Likelihood estimator. Testing of Hypothesis, Simple and Composite hypothesis, Test of significance for Samples, Test for single proportion and for difference of proportion. Test of significance for single mean , Test of significance for difference of means.

UNIT II

Interval estimation: Confidence Interval and Confidence limits, Confidence limits for large samples.

Test of significance: Procedure for testing of Hypothesis, Test of significance for large samples, test for single proportion and for difference of proportions, Test of significance for single mean, Test of significance for difference of means.

UNIT III

Test of significance for small samples: Concept of Chi-square, t and F- statistics, Test for Chi-square distribution, to test goodness of fit, to test independence of Attributes, to test the homogeneity of correlation coefficients.

Test based on t- distribution: t-test for single mean, difference of means , paired t- test, t-test for testing significance of an observed sample correlation coefficient.

UNIT IV

Test based on F- distribution: Test for equality of population variance, Test for testing the significance of an observed multiple correlation coefficients.

Non parametric test: sign- test, median test, run test, Wilcoxon on signed rank test .

UNIT V

Analysis of variance and design of experiments: One -way and two- way classification with one observation per cell, Design of experiments, completely randomized design randomized block design and Latin square design.

Text Book:

1. S.C. Gupta & V.K. Kapoor : Fundamentals of Mathematical statistics, S. Chand sons.

Reference Books:

1. S.C. Gupta & V.K. Kapoor : Fundamentals of Applied statistics, S. Chand sons.
2. A.M.Gun, M.K.Gupta, B Dasgupta: An outline of statistical theory(Volume 1)
3. Kapoor and SINTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE

INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES, DAVV, INDORE
MCA (6 Years) III SEMESTER
IC-304A: Digital Electronics

Aim of Course: To understand basic concepts of digital logic, its operations, principles and applications.

Objectives:

The course is designed to make students:

- Understand number systems and codes, and Boolean Algebra
- Understand TTL and CMOS circuit characteristics, followed by logic devices such as flip-flops, code converters, counters, multiplexers, and registers.

Course Contents:

UNIT I

Binary Systems and logic circuits. Decimal, Binary, Octal, Hexadecimal numbers and their inter conversions. ASCII, Gray, Excess-3, 8-4-2-1, Error detecting and BCD codes. Logic Gates. Boolean algebra. Demorgan's theorem. Binary addition and subtraction. Unsigned Binary numbers, Signed binary numbers. 2's complement representation and its arithmetic.

UNIT II

Circuit analysis and design.

Boolean laws and theorems. Sum of Product and Product of Sum simplification. Two, three and four variable karnaugh map. NAND and NOR implementation. Other two level implementation. Don't care conditions.

UNIT III

Combinational circuits.

Design procedure. Half adder, full adder, adder-subtractor circuit. Code converters. Various logic circuits. Multilevel NAND circuit. Multilevel NOR circuit.

Data Processing circuits.

Multiplexers, demultiplexers, decoders and encoders. Binary parallel adder, look ahead carry generator, magnitude comparator, ROM, PROM, PLA.

UNIT IV

Sequential circuit.

Flip-flops, triggering of flip-flops. Analysis of clocked sequential circuits, state reduction and assignment, flip-flop excitation tables.

UNIT V

Registers, counters and integrated circuits.

Design of counters, registers, shift registers. Ripple counters, synchronous counters. TTL logic families.

Reference Books:

1. M.Morris Mano , Digital Logic and Computer Design.
2. Malvino A.P. and Leach D.P, Digital Principals and Application.
3. Taub H. and Schilling D, Digital Integrated Electronics

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MCA (6 Years) III SEMESTER
IC-305B: Data Structures and Algorithms

Aim of Course: To develop proficiency in the specification, representation, and implementation of Data Types and Data Structures.

Objectives:

The course is designed to make students:

- Write programs using object-oriented design principles.
- Understand data structures such as linear lists, stacks, queues. Choose the appropriate data structure and algorithm design method for a specified application.,
- Be familiar with advanced data structures such as balanced search trees, hash tables, priority queues and graphs.
- To get a good understanding of sorting and searching techniques.

Course Contents :

Unit I: Introduction to Data Structure: Introduction to C++, Introduction to Algorithms and its analysis, Definition of data structures and abstract data types, Classification of Data structures, Examples and real life applications, Data Structures: Arrays, Address calculation in a single and multi dimensional array, sparse matrices.

Unit II : Sorting and Searching: Introduction to Sorting, Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort, Heap sort ,Radix sort.

Searching: Straight Sequential Search, Binary Search, Indexed Sequential Search, Hashing, Collision Resolution Techniques.

Unit III: Linked Lists: Basic concept, Implementation of Linked Lists, Circular implementation of Single linked Lists, Straight / circular implementation of doubly linked Lists.

Unit IV: Stacks and Queue: Introduction to stack, static and Dynamic implementation of stack, Application: Infix, postfix, prefix representation, Mathematical expression Evaluation.

Queues: Basic concept, Various Operations on queue, Static and dynamic implementation of Queue, Circular queue, Double ended queue, Priority Queue.

Unit V: Trees & Graphs: Definition of trees, Binary trees, Properties of Binary trees and Implementation, Binary Tree Traversal - preorder, post order, inorder traversal, Binary Search Trees, Threaded Binary trees, AVL Trees.

Introduction to Graph, Representation of graphs: Adjacency matrix, Adjacency List, Weighted Graph, Introduction to Graph Traversal: Breadth first Traversal and Depth first Traversal.

Text Book:

- Data Structures using C and C++ by A. M. Tenenbaum, Yedidyah Langsam, Moshe J. Augentem, PHI Pub.

Reference Books:

1. Object Oriented Programming in C++ by Robert Lafore.
2. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
3. Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
4. Data Structures and Program Design in C By Robert Kruse, PHI,

5. Data Structure and the Standard Template library – Willam J. Collins, 2003,
T.M.H

**INTERNATIONAL INSTITUTE OF PROFESSIONAL STUDIES
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MCA. (6 Years) III SEMESTER
IC-312: Financial Accounting**

Aim of Course:

The objective of this course is to acquaint students with the accounting concepts, tools and techniques and preparation of accounts for certain businesses.

Objectives:

The course is designed to make students:

- Learn fundamental accounting concepts, elements of financial statements, and basic accounting vocabulary.
- To give an in-depth knowledge of all business transactions and how they should be recorded, classified & interpreted to get a meaningful judgment of viability & profitability of the industry.
- Learn the concepts of journal, ledger, final accounts, cash flow, fund flow and accounting ratio.
- To develop an understanding of financial statements and the principles and concepts underlying them;
- To lay foundation for developing the skills to interpret Financial Statements;

Course Contents:

UNIT I

Fundamentals of Financial Accounting: Meaning and definition of accounting, Need and functions of accounting, users of accounting information, importance and limitations of accounting, Branches of Accounting.

UNIT II

Relationship of accounting with other disciplines, Accounting Principles - Concepts and Conventions, An introduction to Accounting Standards and US GAAPs. Basic terminology of accounting.

UNIT III

Double Entry System-I: Concept of DES, Accounting cycle, Types of Accounts, Types Journal, Golden rules of journalizing, Process of journalizing, Preparation of subsidiary books, Ledger posting and preparation of trial balance.

UNIT IV

Double Entry System-II: Concept of financial statements, preparation of Final A/c without adjustments, Adjustment entries and its needs, preparation of final a/c's with basic adjustments.

UNIT V

Financial Statement Analysis: Concept of financial statement analysis, tools & techniques of financial statement analysis; Fund Flow Statement, Cash Flow Statement and Accounting Ratio with numerical exercises.

Reference Books:

1. T.S. Grewal, Introduction to accountancy, S. Chand & co. Ltd.,
2. P.C. Tulasian, Pearson Editions, Introduction to Accounting
3. Accounting Standards - Institute of Chartered Accountants of India

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IC-313: Digital Computer Organization

Aim of Course: To make students understand the organization of the computer, and the way the hardware components are connected together to form a computer system, and the development of the hardware for the computer taking into consideration a given set of specifications.

Objectives:

The course is designed to make students:

- Understand the various functional units of CPU.
- Study various units of ALU.
- Understand instruction formats and addressing modes.
- Understand interconnection and interfacing of various units of computer system.

Course Contents:

UNIT I

Introduction to Computer Organization, Von Neumann Architecture, Computer Components, Interconnection Structures, Bus Interconnection.

UNIT II

Input Output Organization: I/O interface models of transfer, Interrupt driven I/O, Priority interrupt, Direct Memory Access, I/O processor and Serial communication, Synchronous, Asynchronous data transfer, Strobe control, Handshaking, Peripheral Component Interconnect, Working mechanism of Peripherals: Keyboard, Mouse, Scanners, Video Display, Touch Screen panel etc. (features and principles).

UNIT III

Memory Organization: Memory hierarchy, Internal and External memory. Types of memory: ROM, PROM, EPROM, EEPROM, RAM: SRAM, DRAM, etc.

High speed memories: Cache memory-organization and mapping techniques, Virtual memory, Secondary storage: Magnetic disk, Tape, Optical memory, CDROM, DVD, etc.

UNIT IV

CPU Organization: General register organization, Stack organization and Accumulator type organization. Instruction formats – three address instruction, two addresses, one address and zero address instructions, Instruction set selection. Addressing modes: - Immediate, Direct, Indirect, Register, Indexed etc.

UNIT V

Control Unit: Instruction word format, Fetch and Execution cycle, Sequence of operation of control registers, Control of arithmetic operations, Microprogramming concepts.

Text Books:

- 1 Computer Organization and Architecture by William Stalling, 8th edition, Pearson Pub.
- 2 Computer System Architecture by M. Morris Mano, 3rd edition, Prentice Hall of India

Reference Books:

- 1 Computer Organization by D A Godse and A P Godse
- 2 Computer Architecture and Organization by J.P. Hayes, 2nd edition, Tata McGraw Hill
- 3 Structured Computer Organization by A.S. Tanenbaum, 3rd edition, Prentice Hall of India