REGULATION 2015 (CBCS)
M.C.A – MASTER OF COMPUTER APPLICATIONS
CURRICULUM AND SYLLABUS

I SEMESTER

S.No.	SUB. CODE	SUBJECT	L	T	P	C
1.	MCA101	PROGRAMMING IN C AND UNIX	3	1	0	3
2.	MCA102	DIGITAL LOGIC AND FUNDAMENTALS	3	1	0	3
3.	MCA103	SOFTWARE ENGINEERING AND METHODOLOGY	4	0	0	4
4.	MCA104	MICROPROCESSOR BASED SYSTEM DESIGN	3	1	0	3
5.	MMA105	MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE	3	1	0	3
6.	MCA1L1	LAB – I PROGRAMMING IN C LAB	0	0	6	2
7.	MCA1L2	LAB – II MICROPROCESSOR LAB	0	0	6	2
Total Credits						**20**

II SEMESTER

S.No.	SUB. CODE	SUBJECT	L	T	P	C
1.	MCA201	OBJECT ORIENTED PROGRAMMING IN C++	3	1	0	3
2.	MCA202	DATA STRUCTURES AND ALGORITHMS	3	1	0	3
3.	MCA203	OPERATING SYSTEMS	3	1	0	3
4.	MCA204	SYSTEM SOFTWARE	4	0	0	4
5.	MMA205	STATISTICS	3	1	0	3
6.	MCA2L1	LAB – III DATA STRUCTURE LAB	0	0	6	2
7.	MCA2L2	LAB – IV OS LAB	0	0	6	2

Total Credits	20

III SEMESTER

S.No.	SUB. CODE	SUBJECT	L	T	P	C
1.	MCA301	PROGRAMMING IN JAVA	3	1	0	3
2.	MCA302	DESIGN ANALYSIS OF ALGORITHMS	3	1	0	3
3.	MCA303	VISUAL PROGRAMMING	3	1	0	3
4.	MCA304	FINANCIAL AND MANAGEMENT ACCOUNTING	4	0	0	4
5.		**Core Elective - I**	3	1	0	3
6.	MCA3L1	LAB – V JAVA LAB	0	0	6	2
7.	MCA3L2	LAB – VI VISUAL PROGRAMMING LAB	0	0	6	2
Total Credits						**20**

IV SEMESTER

S.No.	SUB. CODE	SUBJECT	L	T	P	C
1.	MCA401	DATABASE TECHNOLOGY	3	1	0	3
2.	MCA402	WEB TECHNOLOGY	3	1	0	3
3.	MCA403	SOFTWARE PROJECT MANAGEMENT	3	1	0	3
4.		**Core Elective - II**	3	1	0	3
5.		**Non Major Elective - I**	2	0	0	2
6.	MCA4L1	LAB – VII WEB TECHNOLOGY LAB	0	0	6	2
7.	MCA4L2	LAB – VIII SOFTWARE DEVELOPMENT LAB	0	0	6	2

8.	MCA404	**TERM PAPER**	0	0	0	1
Total Credits						**19**

V SEMESTER

S.No.	SUB. CODE	SUBJECT	L	T	P	C
1.	MCA501	MULTIMEDIA SYSTEMS	3	1	0	3
2.	MCA502	COMPUTER NETWORKS	4	0	0	4
3.	MCA503	PROGRAMMING IN ASP.NET	3	1	0	3
4.		**Open Elective – I**	3	1	0	3
5.		**Non Major - Elective II**	2	0	0	2
6.	MCA5L1	LAB – IX ASP.NET LAB	0	0	6	2
7.	MCA5P1	LAB – X PROJECT PHASE - I	0	0	6	2
Total Credits						**19**

VI SEMESTER

S.No.	SUB. CODE	SUBJECT	L	T	P	C
1.	MCA6P2	PROJECT PHASE - II	0	0	24	**10**

TOTAL CREDITS FOR THE PROGRAMME - 108

CHOICES FOR CORE ELECTIVES

SUBJECT CODE	SUBJECT	L	T	P	C
Core Elective - I					
MCA3E1	COMPUTER GRAPHICS	3	1	0	3
	OBJECT ORIENTED ANALYSIS AND DESIGN	3	1	0	3
	IMAGE PROCESSING	3	1	0	3
Core Elective – II					
MCA4E1	SOFTWARE TESTING	3	1	0	3
	AD HOC NETWORKS	3	1	0	3
	DATA MINING AND DATA WAREHOUSING	3	1	0	3

CHOICES FOR NON MAJOR ELECTIVES

SUBJECT CODE	SUBJECT	L	T	P	C
NON MAJOR ELECTIVE - III					
MCA4E2	ADVERTISING AND SALES MANAGEMENT	2	0	0	2
	CALL CENTRE MANAGEMENT – VOICE & NON VOICE	2	0	0	2
	CUSTOMER RELATIONSHIP MANAGEMENT	2	0	0	2
NON MAJOR ELECTIVE – V					
MCA5E2	HUMAN RESOURSE MANAGEMENT	2	0	0	2
	LOGISTICS & SUPPLY CHAIN MANAGEMENT	2	0	0	2
	ENTREPRENEURSHIP DEVELOPMENT	2	0	0	2

CHOICES FOR OPEN ELECTIVES

SUBJECT CODE	SUBJECT	L	T	P	C
Open Elective - I					
MCA5E1	PHOTOGRAPHY & VIDEOGRAPHY	3	1	0	3
	YOGA AND STRESS MANAGEMENT	3	1	0	3
	OFFICE MANAGEMENT	3	1	0	3

	BPO MANAGEMENT	3	1	0	3

MCA101 - PROGRAMMING IN C AND UNIX

Course Objectives

- Understand the basic concepts of C programming.
- Practice the use of conditional and looping statements.
- Implement arrays, functions and pointers.
- Gain skills to handle strings and files.

Course Outcomes
After successful completion of this course, the students should be able to

CO01- Employ good software engineering practices such as incremental development, data integrity checking and adherence to style guidelines.
CO02- Learn about the structure of an operating system, processes and threads, memory management, file management and device management.
CO03- Select and model data using primitive and structured types.
CO04- Construct programs that demonstrate effective use of C features including arrays, structures, pointers and files.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S		S	S								
CO02	S	S										
CO03	M				M							
CO04	S	M							S			M

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. Quiz 5. Online Test 6. End Semester Exam	Course End Survey Academic Experts Industry Alumni

UNIT – I INTRODUCTION **9**

Basic Elements of C – Data types – Operators – Control Statements – Branching – Looping, Nested Control Structures – Prototypes and Functions – Parameter passing methods – Recursion – Storage classes – Library Functions – Arrays – Passing arrays to functions – Multi – dimensional arrays – Strings operations – enumerated data types.

UNIT – II STRUCTURES **9**

Structures – user defined Data Types – Union – Nested Structure, Passing Structure to functions – Pointer concept – Declaration – accessing variable through pointer – initializing pointer variable – pointers and functions – pointers and arrays – example programs using pointers with function, arrays– command line arguments – self referential structures.

UNIT – III DYNAMIC MEMORY ALLOCATION **9**

Dynamic memory allocation –file handling – file pointer – high level file operations – opening and closing of file – creating, processing and updating on files – simple file handling programs.

UNIT – IV INTRODUCTION TO UNIX **9**

Introduction to Unix – Unix components – Unix files – file attributes and permission – standard I/O – redirection – pipes and filters – grep and stream editor – process and signal commands.

UNIT – V SHELL PROGRAMMING **9**

Shell programming – Shell variables – Control Structures – Arithmetic in Shell programming – Debugging Scripts – Structure of an AWK script – AWK control Structures – Functions in AWK – Executing AWK scripts with the shell.

Total : 45 Hours

Text Books:

1. Let Us C by Yashawant Kanetkar, 5th Edition.
2. Das, Sumitabha, 2001, UNIX:THE ULTIMATE GUIDE, Tata McGraw Hill, Delhi.

Reference Books:

1. Byron S Gottfried, 2006, Schaum's Outlines Programming with c, 4th Edition, PHI, New Delhi.
2. J.R. Hanly and E.B. Koffman, 2005, Problem solving and program design in C, 4th Edition, Pearson Education India, Delhi.

3. B.A. Fozougar, R.Failberg, 2003, Unix and shell programming, Thomson

MCA102 - DIGITAL LOGIC AND FUNDAMENTALS

Course Objective:

- Understanding fundamental principles of digital electronics, semiconductor memories, A/D and D/A converters.

Course Outcomes

After successful completion of this course, the students should be able to

CO01 - Students will learn the number representations used in today's digital systems and their arithmetic properties and conversion techniques.

CO02 - Students will learn to analyze and synthesize networks of combinatorial, digital logic elements.

CO03 - Students will learn to analyze and design digital, clocked sequential circuits.

CO04 - Students will enhance professional writing and participate in a teamwork process

CO05 - By performing engineering design using modern computer tools and writing a corresponding technical report.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S			S								
CO02	S	M	M	S								
CO03	M	S	S									
CO04	S	M	S									
CO05	M	S	S		S							

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. Quiz 5. Online Test	Course End Survey Academic Experts Industry Alumni

6. End Semester Exam	

UNIT I: NUMBER SYSTEMS **9**

Number systems – Conversion from one number to another – Compliments – Binary codes – Binary logic – Logic gates – Truth tables. Boolean Algebra – Axioms – Simplification of Boolean functions – Karnaugh Map method (up to 5 variables) – Tabulation method.

UNIT II: COMBINATIONAL CIRCUITS **9**

Adders – Sub tractors – Code Converter – Multilevel NAND and NOR circuits – Binary parallel Adder – Decimal Adder - Decoders – Encoders – Multiplexes – Demultiplexer – Design of circuits using Multiplexers/Decoders.

UNIT III: SEQUENTIAL CIRCUITS **9**

Flip Flops – RS, JK,D and T Flip Flops –Excitation Table - Registers – Shift Registers – Counters – Ripple Counters – Synchronous Counters – Design of Counters.

UNIT IV: MEMORY UNIT **9**

Memory Unit – Bus Organization – ALU – Design of ALU – Status Register – Effects of Output carry – Microprogramming – Design of Specific Arithmetic Circuits.

UNIT V: ACCUMULATOR **9**

Accumulator – Design of Accumulator – Computer configuration – Instruction and Data formats – Instruction sets – Timing and Control – Execution of instruction – Design of computer – Hardwired control – PLA Control and Microprogram control.

Total : 45 Hours

Text Books:

1. M.M. Mano, Digital Logic Computer Design, Pearson Education.

Reference Books:

1. Givone, 2002, Digital Principles Design, Tata McGraw Hill, New Delhi.
2. V. Rajaraman, 2002, Fundamental of Computers, Third Edition, PHI, New Delhi.

3. T.C. Bartee, 1991, Computer Architecture and Logical Design, Mc Graw Hill.

MCA103 - SOFTWARE ENGINEERING AND METHODOLOGY

Course Objectives

- To provide an insight into the processes of software development.
- To understand and practice the various fields such as analysis, design, development, testing of software engineering.
- To develop skills to construct software of high quality with high reliability.

Course Outcomes:

After successful completion of this course, the students should be able to

CO01: Outline the features of different lifecycle models.
CO02: Explain the principles involved in gathering and validating software requirements.
CO03: Make use of suitable models through analysis of requirements and arrive at an appropriate software design.
CO04: Appreciate the quality assurance procedures during software development.
CO05: Explain software project management and software maintenance practices.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	M	M										
CO02		S										
CO03	M		M									
CO04	M											
CO05	M	S										

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT –I INTRODUCTION **12**

Software Engineering paradigms - Waterfall life cycle Model, spiral Model, Prototype Model, 4th generation techniques – Planning – cost estimation – Organization structure – Software Project scheduling, Risk analysis and Management – Requirements and specification – Rapid prototyping.

UNIT –II SOFTWARE DESIGN **12**

Abstraction Modularity – Software architecture – cohesion, coupling – various design concepts and notation Real time and distributed system design – Documentation Data flow oriented design – Jackson system development – Design for reuse – Programming Standards.

UNIT –III SOFTWARE METRICS **12**

Scope – Classification of Metrics – Measuring process and product attributes – Direct and indirect measures – Reliability – Software Quality Assurance – Standards.

UNIT –IV SOFTWARE TESTING AND MAINTENANCE **12**

Software Testing fundamentals – Software testing Strategies – Black Box Testing, white Box Testing, system testing – Testing tools – Test case Management – Software Maintenance organization Maintenance report – Types of Maintenance.

UNIT –V SOFTWARE CONFIGURATION MANAGEMENT (SCM) & CASE TOOLS **12**

Need for SCM – version control – SCM Process – Software configuration – taxonomy – Case repository – Features.

Total : 60 Hours

TEXT BOOK:

1. Roger.S.Pressman, “Software Engineering, & Practitioner Approach”. 5th edition,
2. Fairely, “Software Engineering Concepts” McGRaw Hill 1985.

REFERENCE BOOKS:

1. Sommerville, I “Software Engineering”, 5th edition.
2. K.K.Agarwal & Yokesh singh “Software Engineering” – 2001.
3. Stevenson.C. “Software Engineering Productivity” – 1995.

MCA104 - MICROPROCESSOR BASED SYSTEM DESIGN

Course Objectives:-

- To introduce the architecture and programming of 8085 microprocessor.
- To introduce the interfacing of peripheral devices with 8085 microprocessor.
- To introduce the architecture and programming of 8086 microprocessor.
- To introduce the architecture, programming and interfacing of 8051 micro controller.

Course Outcomes:

After successful completion of this course, the students should be able to

CO01: Identify the basic functions of a microprocessor and explain the instruction sets of 8086 microprocessors.

CO02: Make use of the instruction set of 8085 microprocessor and develop assembly code to solve problems.

CO03: Illustrate the use of various general purpose interfacing devices.

CO04: Develop skills to write programs using 8086 processor development tools.

CO05: Compare the architecture of 8086 microcontroller.

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02	S	M	M									
CO03	S	M										
CO04		S	M									
CO05		S										

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT – I INTRODUCTION **9**

Introduction to 8086 assembly language programming - Development steps - Construction - Writing programs and Development Tools.

UNIT-II 8086 BASED SYSTEM DESIGN **9**

Standard program structures - simple programs - Jumps - While do - repeat - until - delay loops. Strings - Procedures -Macros - Instruction Descriptions Assembler Directives.

UNIT-III INTERRUPT HANDLING **9**

8086 Microcomputer - Observing Bus Signals - minimum mode system - Trouble shooting - 8086 interrupts - Interrupts Applications - Programmable times / Counter Interrupt controller.

UNIT-IV INTERFACING CONCEPTS **9**

Parallel Ports-Handshaking - Interfacing Digital Devices-Analog Interfacing - Industrial Control.

UNIT-V MEMORY MANAGEMENT **9**

DMA - DRAMS - Cache Memories - Co-processors - EDA Tools - 80286, 80386 and 80486 Microprocessors.

Total :45 Hours

TEXT BOOKS:

1. Douglas V Hall: "Microprocessors and Interfacing - Programming and Hardware" – TMH-1999.
2. K. Udayakumar and B. S. Umashankar - "Advanced Microprocessors and IBM - PC Assembly Language Prograrnming"- TMH - 1998.

REFERENCE BOOKS:

1. Yu-Cheng Liu, Glen A. Gibson -"Microcomputer Systems: The 8086/ 8088 family", Prentice Hall of India Private limited, 2001.
2. "Microprocessor Data Hand Book", BPB Publications, Revised Edition 2000, compiled by A. K. Jain

3. Barry B. Brey, "Programming the 80286, 80386, 80486 and Pentium - Based Personal Computer", Prentice Hall of India Private Limited.

MMA105 - MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

Course Objectives

- ☐ To know about matrices, to find eigen values and eigen vectors of a matrix.
- ☐ To understand the concepts of set theory and relations.
- ☐ To understand mathematical logic (propositional and predicate logic).

Course Outcomes

After successful completion of this course, the students should be able to

CO01 - Solve the system of linear homogeneous as well as non-homogeneous equations and to find the eigen values and eigen vectors of real symmetric as well as non-symmetric matrices.

CO02 - Know the concept and applications of different types of relations and functions.

CO03 - Analyze the given propositions and finding the results using mathematical logic operators.

CO04 - Describe the different types of languages and grammars.

CO05 - Understand the difference between deterministic and non deterministic finite state automata and the conversion of NFA to DFA.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01		S	M	S								
CO02	S	S		S								
CO03	M	S	S		M							
CO04		M	S									
CO05	M	S			S							

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT I: MATHEMATICAL LOGIC: **9**

Statement Calculus – Connectives – normal forms – predicate Calculus - Theory of inference for statement calculus – Predicate calculus including theory of inference.

UNIT II: SET THEORY: **9**

Basic concepts of set theory – relations and ordering – functions – recursion.

UNIT III: ALGEBRAIC STRUCTURES: **9**

Semi groups – Monoids – grammars and languages – groups and subgroups- polish experiments and their compilation.

UNIT IV: ROOTS OF EQUATIONS: **9**

Graphical Method – bisection Method – False position Method – Newton Raphson method – Secant method. Algebraic equations: Elimination – Gauss Jordan – LU Decomposition – Matrix Inverse – Gauss Seidel.

UNIT V: NUMERICAL DIFFERENTIATION – INTEGRATION: **9**

Trapezoidal Rule – Simpson's Rule – Romberg Integration – Differential equations: Taylor's method – Euler's method – Runge Kutta $2^{nd\ and}$ 4^{th} order methods. Milne Predictor – corrector.

Total : 45 Hours

Text Books:

1. J.P.Tremblay and R. Manohar, Discrete Mathematical Structure with Applications to computer science, Tata McGraw Hill Edition – 1975.

2. Numerical Methods by A. Singaravelu. Meenakshi Publications 2000.

MCA1L1 - PROGRAMMING IN C LAB

Course Objectives

- ☐ Understand the basic concepts of C programming.
- ☐ Practice the use of conditional and looping statements.
- ☐ Implement arrays, functions and pointers.
- ☐ Gain skills to handle strings and files.

Course Outcomes
After successful completion of this course, the students should be able to

CO01 - Employ good software engineering practices such as incremental development, data integrity checking and adherence to style guidelines.

CO02 - Select and model data using primitive and structured types.

CO03 - Construct programs that demonstrate effective use of C features including arrays, structures, pointers and files.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S	M	S	S								
CO02	S	S		S	S							
CO03	M	S	S		M							

Course Assessment methods:

Direct	Indirect
1.Observation Book 2. Record Book 3.Model Exams 4.Viva Voce 5. End Semester Exam	Course End Survey Academic Experts Industry Alumni

S.No..	List of Practical Programs
1.	Determining whether the given number is prime or not
2.	Pascal's Triangle
3.	String Manipulation
4.	Matrix Multiplication
5.	Finding determinant of a Matrix
6.	Finding inverse of a Matrix
7.	Checking for Tautologies and Contradictions
8.	Euclidean's Algorithm for finding GCD
9.	Generating Permutation
10.	Computing Combinations
11.	Creating database for telephone number and related operations. Use structures.
12.	Creating database for Web page addresses and related operations. Use pointers.
13.	File processing
14.	Finding roots of Quadratic equations

TOTAL : 30 Hours

MCA1L2 - MICROPROCESSOR LAB

Course Objectives:

- ☐ Understand the basic concepts of 8086 Microprocessor.
- ☐ Practice the use of conditional and looping statements.
- ☐ Implement all the statements using 8086 Microprocessor Kit / MASM software ☐

Course Outcomes:

After successful completion of this course, the students should be able to

CO01: Make use of the microprocessor trainer kit to execute 8085 programs.
CO02: Develop assembly language program for 8085to solve simple programs.
CO03: Make use of interfacing devices for a specified application.
CO04: Develop simple assembly language program for 8086.
CO05: Develop assembly language program for 8086 using BIOS/DOS Calls.

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02	S	M										
CO03	S	M	M									
CO04	S	M										
CO05	S	S										

Course Assessment methods:

Direct	Indirect
1.Model Exams 2.Observation 3.Viva Voce 4. Record book 5. Record Book	Course End Survey

S.No.	LIST OF PRACTICAL PROGRAMS
	Using 8086 Microprocessor Kit / MASM Software
1.	Multiple addition/subtraction of signed numbers□ □ □ □ □
2.	Computing LCM
3.	Computing GCD of N numbers
4.	Insertion Sort
5.	Selection Sort.
6.	Linear Search.
7.	Matrix Multiplication.
8.	Computing Factorial.
9.	Computing NCR.
10.	Computing Fibonacci Series.
11.	Finding Memory Size.
12.	Clearing Screen
13.	Moving String of Characters on CRT
14.	Checking Password.
15.	Displaying Command Line parameter

TOTAL : 30 Hours

MCA201 - OBJECT ORIENTED PROGRAMMING USING C++

Course Objectives:-

- To demonstrate the differences between traditional imperative design and object-oriented Design. To understand the role of inheritance, polymorphism, dynamic binding and generic Structures in building reusable code.

Course Outcomes:

CO01: Demonstrate class object concepts by using C++.
CO02: Develop programs using inheritance and polymorphism.
CO03: Demonstrate the significance of constructors and destructor.
CO04: Implement function and operator overloading using C++.
CO05: Construct generic classes using template concepts.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02			M									
CO03		S										
CO04			M									
CO05		M										

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT I : INTRODUCTION **9**

Introduction about OOPS – Data types – Operators – Control Statements – Looping, Branching – Functions. Pointers.

UNIT II : CLASSES AND OBJECTS **9**

Classes and Objects – Nested or Inner Classes – Constructors – Destructors – Inline functions – Friends functions – This Operators

UNIT III : INHERITANCE **9**

Inheritance – Single – Multiple – Multilevel – Hybrid – Hierarchical

UNIT IV : POLYMORPHISMS **9**

Polymorphisms – Overloading – Functions – Operators – Virtual Functions – Pure Virtual Functions.

UNIT V : TEMPLATES AND FILE HANDLING **9**

Exception Handling - Templates – Functions template and Class templates – Files.

Total : 45 Hours

TEXT BOOKS:

1. Herbert Schildt ,C++ “The Complete Reference “, III Edition , 1999.
2. D. Ravichandran, “Programming in C++” D. Ravichandran Tala McGraw Hill 2002.

REFERENCE BOOKS

1. Schaum’s Outlines – “Programming with C++” , II edition, Tata McGraw Hill 2002.

2. BjaPN Stroustrup, “The C++ Programming language” Third Edition, Addison Wesley , 2000

MCA202 - DATA STRUCTURES & ALGORITHMS

Course Objectives

- ☐ The advanced data structures related to handling data (AVL trees, B trees, B+ trees, Heap, Table) are introduced in this course.
- ☐ Analyze the asymptotic performance of algorithms.
- ☐ Apply important algorithmic design paradigms and methods of analysis.

COURSE OUTCOMES:

CO01: Implement various basic data structures and its operations.
CO02: Implement various sorting and searching algorithms.
CO03: Implement various tree operations.
CO04: Implement various graphs algorithms.
CO05: Develop simple applications using various data structures.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02	S		M									
CO03		S										
CO04	M	M										
CO05		M	M									

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT-I INTRODUCTION **9**

Introduction - Lists - Stacks - Queues - Linear data structure, Array and Linked lists - Implementation - Applications

UNIT-II TREES **9**

Trees - general and binary trees - operations - traversals - search trees -balanced trees

UNIT-III SORTING **9**

Sorting - Insertion sort - Quick sort - Merge sort - Heap sort - Sorting on several keys - External sorting.

UNIT – IV GRAPHS **9**

Graphs representation - Traversal - Topological tables and files - Sorting - Applications - Representation - Making techniques - Files - Sequential - Index sequential - Random access organization - implementation.

UNIT-V : ALGORITHM ANALYSIS AND DESIGN **9**

Algorithms - Time and space complexity - Sorting - Design techniques - Knapsack - Traveling salesman -Graph coloring - Squeezing.

Total : 45 Hours

Text Books:

1. Kruse R. L.. Leung BP Tondo C. L., "Data Structures and program design in C", PHI. 1995.
2. Horowitz, Sahni, S. Rajsekaran, "Computer Algorithms", Galgotia, 2000.

References:

1. Bills Horowitz, Sahni & Dinesh Mehta "Fundamental of data structuresin C++", Galgotia, 1999.
2. Tanenbaum A. S.Langram Y., Augestein M.J. "Data structures using C", PHI, 1992.
3. Jean, Paul tremblay, Paul. G Sorenson, "An introduction to data structures with application", Tata McGraw Hill, 1995.

MCA203 - OPERATING SYSTEM

Course Objectives

- ☐ To learn the fundamentals of operating systems.
- ☐ To gain knowledge on process management, CPU scheduling and memory management.
- ☐ To gain knowledge on disk scheduling and file systems.

Course Outcomes:

After successful completion of this course, the students should be able to

CO01: Illustrate the operating system concepts and its functionalities.
CO02: Apply various CPU scheduling algorithms for problems.
CO03: Outline the needs and applications of process synchronization.
CO04: Identify the issues in deadlock and memory management.
CO05: Illustrate various file and disk management strategies.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	M											
CO02	S	S	S									
CO03	S											
CO04	M	M		S								
CO05	M	M										

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT –I INTRODUCTION **9**

Multiprogramming – Time Sharing – Distributed system – Real Time systems – I/O structure – Dual Mode operation – Hardware protection – General System architecture – OS services – system calls – System programs – system design and implementation.

UNIT –II PROCESS MANAGEMENT 9

Process concept – Concurrent process – Scheduling concept – CPU Scheduling algorithms – Multiple Processor scheduling.

UNIT –III PROCESS SYNCHRONIZATION **9**

Critical section – Synchronization hardware – semaphores Classical Problems of synchronization – Inter –process communication – Deadlock – Characterization, Prevention, Avoidance, and Detection.

UNIT –IV STORAGE MANAGEMENT **9**

Swapping, Single and Multiple Partition allocation – Paging – Segmentation – Paged Segmentation Virtual Memory – Demand Paging – Page replacement algorithm- Thrashing – Secondary storage Management Disk structure – Free Space Management – Allocation methods – Disk scheduling – Performance and reliability improvements – storage hierarchy.

UNIT –V FILES AND PROTECTION **9**

File system organization, File operations – Access Methods – Consistency semantics-Directory structure organization – File Protection – Implementation issues – Security – Encryption – Case Study – UNIX and Windows NT – Introduction to distributed OS design.

Total : 45 Hours

TEXT BOOKS:

1. Silberschatz and Galvin , “Operating System Concepts”, 4th Edition Addison Wesley Publishing co, 1995.
2. Milankovic . M “Operating System Concepts and Design”, 2nd Edition, McGraw Hill, 1992.

REFERENCE BOOKS:

1. Deital ,” An Introduction to Operating System”, Addison Wesley Publishing Co.,1985.

2. Gray Nutt, "Operating System", A. Modern Perspective – 2000

MCA204 - SYSTEM SOFTWARE

Course Objectives:-

- To give CS graduates the knowledge and skills necessary to participate as an effective team member or team leader in the development of large computer and software systems covering a broad range of engineering and scientific applications.

Course Outcomes:-

After successful completion of this course, the students should be able to

CO01 - An ability to apply knowledge of computing and mathematics appropriate to the discipline
CO02 - An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
CO03 - An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
CO04 - An ability to function effectively on teams to accomplish a common goal
CO05 - An understanding of professional, ethical, legal, security and social issues and responsibilities

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	**Programme Outcomes(POs)**											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S	M	S	S								
CO02	S	S		S	S							
CO03	M	S	S		M							
CO04	S	M	S									
CO05	M	S	S		S							

Course Assessment methods:

Direct	**Indirect**
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam	Course End Survey Quiz Online test Alumni

5. Lab Exercise	

UNIT-I INTRODUCTION **12**

Basic concepts – Machine Structure – Typical architectures.

UNIT-II ASSEMBLERS **12**

Functions – Machine dependent and Machine independent assembler features – Design and Implementation – Examples.

UNIT-III LOADERS AND LINKERS **12**

Functions – Machine dependent and Machine independent loaders features – Linkage editors – Dynamic linking – Boot –strap loaders – Implementation – Examples.

UNIT-IV MACRO PROCESSOR **12**

Functions – Features – Recursive macro expansion – General purpose macro processors – Macro processing within language translators – Implementation – Examples.

UNIT-V COMPILERS AND UTILITIES **12**

Introduction to compilers – Different phase of a compiler – simple one pass compiler – Code optimization techniques – System software tools – Text editors – Interactive debugging systems.

Total : 60 Hours

Text Books:

1. John J.Donovan, “Systems Programming”, Tata McGraw Hill Edition, 1991.

Reference Books:-

3. Let and L.Beck, “System Software – An Introduction to system programming”, 3rd edition,Addison – Wesley, 1999.
4. D.M.Dharndhere, “System Programming and Operating Systems”, Tata Mc Graw Hill Company, 1993.

5. A.U.Aho, Ravi Sethi and J.D. Ullman, "Compilers Principles, Techniques and Tools" Addison – Welsley, 1988.
6. Bharat T.M. Chandrasekar, "System Software Made easy", 1999.
7. A.U.Aho, Ravi Sethi and J.D. Ullman, "Principles of Compiler design", Addison Wesley, 1988.

MCA205 - STATISTICS

Course Objectives

- ☐ To know the use of measures of central tendency, dispersion and correlation for analysis of data.
- ☐ To understand the concepts of probability and random variables.
- ☐ To know about some standard distributions and their properties.

Course Outcomes

After successful completion of this course, the students should be able to

CO01 - To be able to test hypothesis using various tests for large and small samples.
CO02- To analyze experiments based on one–way, two–way and Latin square classifications.
CO03 - To understand the basics of quality control using control charts.
CO04 – To understand basic concepts of probability and random variables.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S	M	S	S								
CO02	S	S		S	S							
CO03	M	S	S		M							
CO04	S	M	S									

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT I : INTROUCTION **9**

Random Experiments – Probability – Baye's theorem – Random variables – Expectation – Variance – Chebychev's Inequality.

UNIT II : DISTRIBUTION **9**

Bivariate distribution – conditional and marginal Distributions – Standard Distributions: Binomial, geometric – Poisson- uniform- Normal –Exponential distribution .

UNIT III : CORRELATION & REGRESSION **9**

Introduction to correlation – Measures of Fitting of curves using method of least squares – Regression lines.

UNIT IV : SAMPLING **9**

Sampling techniques – tests of hypotheses- small & Large sample tests – t test - Chi square test – F test.

UNIT V : ANOVA **9**

ANOVA – introduction – one way and two way methods – Design of experiments – CRD – RBD – LSD.

Total : 45 Hours

Text Books:

1. Probability and statistics with reliability, Queueing and computer Science Applications – Trivedi K.S- Prentice Hall India 1994.

Reference Books:

1. Introduction to mathematical statistics – Mood A.M , Graybill F. and Boes – Mcgraw hill 1974
2. Probability, Statistics and Queueing theory with computer science applications – Arnoid Allen – 1978.

3. Computer oriented statistical methods – A.Singaravelu- A.R Publications
4. Elements of Probability and statistics – Basinab A.P – TMH 1993.

MCA2L1 - DATA STRUCTURES LAB

Course Objectives

- Be familiar with basic techniques of algorithm analysis
- Be familiar with writing recursive methods
- Master the implementation of linked data structures such as linked lists and binary trees
- Be familiar with advanced data structures such as balanced search trees, hash tables, priority queues and the disjoint set union/find data structure

COURSE OUTCOMES:

CO01: Implement various basic data structures and its operations.
CO02: Implement various sorting and searching algorithms.
CO03: Implement various tree operations.
CO04: Implement various graphs algorithms.
CO05: Develop simple applications using various data structures.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02	S		M									
CO03		S										
CO04	M	M										
CO05		M	M									

Course Assessment methods:

Direct	Indirect
1.Model Exams 2. End Semester Exam 3.Viva Voce 4. Observation 5. Record Book	Course End Survey

S.No.	List of Practical Programs
1.	Implementation of Single Dimensional Arrays.
2.	Implementation of Multi Dimensional Arrays.
3.	Implementation of Stack (Using Arrays)
4.	Implementation of Stack (Using Pointers)
5.	Implementation of Queue (Using Arrays)
6.	Implementation of Queue (Using Pointers)
7.	Implementation of Circular Queue (using Arrays and Pointers)
8.	Infix to Postfix Expression Conversion
9.	Evaluation of Postfix Expressions
10.	Singly Linked List
11.	Doubly Linked List
12.	Circular Linked List
13.	Binary Tree Traversals (Preorder, Inorder, Postorder)
14.	Depth First Search
15.	Breadth First Search

Total: 30 Hours

MCA2L2 - OPERATING SYSTEM LAB

Course Objective:

The objective of the course is to provide basic knowledge of computer operating system structures and functioning.

Course Outcomes:

CO01: Demonstrate UNIX / Linux commands.
CO02: Implement various commands using shell programming.
CO03: Implement various CPU scheduling algorithms.
CO04: Implement various disk scheduling algorithms.
CO05: Implement memory management techniques.

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

	Programme Outcomes(POs)											
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	M	M										
CO02	M	M										
CO03		M	M	S								
CO04		M	M									
CO05		S	S									

Course Assessment methods:

Direct	**Indirect**
1.Model Exams 2. End Semester Exam 3.Viva Voce 4. Record Book 5. Observation	Course End Survey

S. No.	List of Practical Programs
1.	Inter Process Communication (IPC) using Message Queues.
2.	IPC Using Pipes
3.	Implementation of wait and Signal using counting Semaphores
4.	Atomic Counter update problem
5.	IPC Using Pipes
6.	Implementation of wait and Signal using counting Semaphores
7.	Atomic Counter update problem
8.	Signaling processes
9.	Deadlock detection (for process passing messages)
10.	Process scheduling FCFS
11.	Process Scheduling: Least Frequency used.
12.	Process Scheduling: Round Robin
13.	Producer – Consumer problem with limited buffers

Total: 30 Hours

MCA301 - PROGRAMMING IN JAVA

Course Objectives

- Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- Have the ability to write a computer program to solve specified problems.
- Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.

Course Outcomes:

After successful completion of this course, the students should be able to

CO01: Show competence in the use of the Java programming language in the development of small to medium- sized application programs that demonstrate professionally acceptable coding and performance standard;

CO02: Understand the basic principles of the object-oriented programming .

CO03: Demonstrate an introductory understanding of graphical user interfaces, multi-threaded programming, and event-driven programming.

CO04: Be aware of the important topics and principles of software development.

CO05: Be able to use the Java SDK environment to create, debug and run simple Java programs.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02			M									
CO03		S										
CO04			M									
CO05		M										

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT-I INTRODUCTION **9**

Java features – Benefits – Applications – Data types – Expressions – Conditional and iteration executions – References – Arrays – Garbage Collection - Run time environment.

UNIT-II JAVA OBJECT MODEL **9**

Classes – Variables - Methods – Constructors – Access specifies – Inheritance – interface – Packages – Strings – Dynamic binding.

UNIT-III EXCEPTIONS AND THREADS **9**

Exceptions and Errors – Exception classes – Run time Exception – Uncompact Exception – Finally Block – User Defined Exception – Creating Threads – Controlling Threads – Multithreading – Thread Properties – Thread groups.

UNIT-IV JAVA I/O **9**

Java streams – File class – Serialization – Applets.

UNIT-V AWT **9**

AWT controls – Panel – Layout Managers – Event Handling – Event Listener – Dialog box – Menus –Graphics context.

Total : 45 Hours

TEXT BOOKS:

1. Java 2: "The Complete Reference", 3rd Edition – TMGH – 1999 P.Naughton and H.Schildt.
2. "Java Secrets" IDG Book World.

REFERENCE BOOKS:

1. Joseph. L. Weber- "Using Java 2-EEE "-Prentice Hall of India – 1998.
2. Patrick Henry Winston & Sundar Narsimbhan "Onto Java "- Addison Wesley - 1996.
3. Daniel Groner, K. C. Hoipson-"Java Language API Super Bible" – Waite Grocey Press 1996.

MCA302 - DESIGN AND ANALYSIS OF ALGORITHMS

Course Objectives:

- Basic knowledge of graph and matching algorithms.
- Ability to understand and design algorithms using greedy strategy, divide and conquer approach, dynamic programming, and max flow - min cut theory.
- Ability to analyze asymptotic runtime complexity of algorithms including formulating recurrence relations.
- Basic knowledge of computational complexity, approximation and randomized algorithms.

COURSE OUTCOMES:

CO01: Explain the basic concepts of time and space complexity, divide-and-conquer Strategy, dynamic programming, greedy and approximate algorithms.
CO02: Describe the methodologies of how to analyze an algorithm
CO03: Describe the data structures of graph coloring and back tracking
CO04: Design a better algorithm to solve the problems

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02		S	S									
CO03		S										
CO04				S	M							

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT I : INTRODUCTION **9**

Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non-recursive algorithms.

UNIT II : DIVIDE AND CONQUER METHOD AND GREEDY METHOD **9**

Divide and conquer methodology – Merge sort – Quick sort – Binary search – Binary tree traversal – Strassen's matrix multiplication – Greedy method – Prim's algorithm – Kruskal's algorithm – Dijkstra's algorithm.

UNIT III : DYNAMIC PROGRAMMING **9**

Single source shortest paths – Multi stage graphs – 0/1Knapsack problem – String editing.

UNIT IV : BACKTRACKING **9**

Backtracking – 8-Queens problem – Hamiltonian circuit problem – Subset sum problem – Graph coloring

UNIT V : BRANCH AND BOUND AND NP-HARD ,COMPLETE PROBLEMS **9**

Branch and bound – General method – Traveling salesman problem - P & NP problems – NP-complete problems – Approximation algorithms for NP-hard problems

Total : 45 Hours

Text Book:

1. Ellis Horowitz, Sartaj Sahni and S. Rajasekaran "Fundamentals of computer Algorithms" Universities Press 2nd Edition 2007.

Reference Book:

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to algorithms" Prentice Hall 1990.

MCA303 - VISUAL PROGRAMMING

Course Objectives:-

- Identify the differences between the procedural languages and event-driven languages.
- Define and modify the properties and methods associated with an object.
- Load, modify, and save changes made to forms and projects in the Visual Basic environment.

Course Outcomes:-
After successful completion of this course, the students should be able to

CO01: Incorporate programming control structures of sequence, selection and iteration using Visual Basic.
CO02: Create and manipulate variables.
CO03: Create sub procedures and functions using Visual Basic.
CO04: Use string manipulation and sequential files in Visual Basic.
CO05: Write syntactically correct statements using local and global variables, sub procedures, forms, and Windows Environment calls.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S		S		M							
CO02	S		S		S							
CO03	S		S		S							
CO04	S	M	S	M	S							
CO05	S		S		S							

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam	Course End Survey Quiz Online test Alumni

5. Lab Exercise	

UNIT I INTRODUCTION **9**

Customizing a form – writing simple programs – toolbox creating controls – name property – command button – access key – image control – textboxes – labels – message boxes – grid – editing tools – variables – data types – strings – numbers.

UNIT II FUNCTION AND PROCEDURES **9**

Displaying information – determinate loops – indeterminate loops – conditionals – build in functions – functions and procedures.

UNIT III ARRAYS AND RECORDS **9**

List - arrays – sorting and searching – records – control arrays – combo boxes – grid control – projects with multiple forms – do events and sub main – error trapping.

UNIT IV OBJECTS IN VISUAL BASIC **9**

VB objects – dialog boxes – common control – menus – MDI forms – testing debugging and optimization – work with graphics.

UNIT-V FILE HANDLING **9**

Monitoring mouse activity – file handling – file system controls – file system objects – COM/OLE – automation – DLL services – OLE drag and drop.

Total : 45 Hours

TEXTBOOKS:

1. Graycornell-“Visual Basic 6.0 from the Ground up”- Tate Mc GrawHill-1999
2. Noeljerke- “Visual Basic 6.0”Complete Reference) Tate Mc GrawHill-1999

REFERENCE BOOKS:

1. Evangels Petroutsos, Kevin Hough-“Visual Basic Developer’s Hand Book,” BPB Publication, 1998.
2. Lowell Mauro,” Visual Basic 6 Tech Media 1998
3. John Haring Ton, Mark Spank,” Visual Basic Interactive Course “, Tech Media, 1997.

MCA304 - FINANCIAL AND MANAGEMENT ACCOUNTING

Course Objectives

- ☐ To understand the basic principles of double entry system and preparation of balance sheet.
- ☐ To understand the process of estimating the cost of a particular product.
- ☐ To prepare the estimate for various business activities such as purchase, sale, production and cash budgets
- ☐ To ensure decision making process of an organization.

Course Outcomes

After successful completion of this course, the students should be able to

CO01: Understand the balance sheet preparation and do analysis.
CO02: Understand the budget preparation and control of a company.
CO03: Decide about the state of affairs of a particular firm / company.
CO04: Ensure the preparation of fiscal policies of the organization.
CO05: Ensure the factors to be considered in investment policies.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S	S										
CO02	S	M	S		S							
CO03	S	S	S	S								
CO04	S	S										
CO05	S	M		S								

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam	Course End Survey Quiz Online test Alumni

UNIT I: **FINAL ACCOUNTS** **12**

Principles of Accounting: Principles of double entry -Assets and Liabilities - Accounting records and systems - Trial balance and preparation of financial statements - Trading, Manufacturing, Profit and Loss accounts, Balance Sheet including adjustments(Simple problems only).

UNIT II: RATIO ANALYSIS **12**

Analysis and Interpreting Accounts and Financial Statements: Ratio analysis - Use of ratios in interpreting the final accounts (trading accounts and loss a/c and balance sheet) - final accounts to ratios as well as ratios to final accounts.

UNIT III: MARGINAL COSTING **12**

Break-even analysis and Marginal Costing: Meaning of variable cost and fixed cost - Cost-Volume-Profit analysis – calculation of breakeven point, Profit planning, sales planning and other decision – making analysis involving break - even analysis - Computer Accounting and algorithm.(differential cost analysis to be omitted)

UNIT IV: BUDGET FORECASTING **12**

Budget/Forecasting: preparation of and Characteristics of functional budgets, Production, sales, Purchases, cash and flexible budgets.

UNIT V : CAPITAL BUDGETING **12**

Project Appraisal: Method of capital investment decision making: Payback method , ARR method - Discounted cash flows - Net Present values - Internal rate of return - Sensitivity analysis - Cost of capital.

Total : 60 Hours

Reference Books

1. Shukla M.C. & T.S. Grewal, 1991, Advanced Accounts, S.Chand & Co. New Delhi.
2. Gupta R.L. & M. Radhaswamy, 1991, Advanced Accounts Vol. II, Sultan Chand & Sons, New Delhi.
3. Man Mohan & S.N. Goyal, 1987, Principles of Management Accounting, Arya Sahithya Bhawan.
4. Kuchhal, S.C., 1980, Financial Management, Chaitanya, Allahabad. Hingorani, N.L. & Ramanthan, A.R, 1992, Management Accounting, 5th edition, Sultan Chand, New Delhi.

MCA3L1 - JAVA PROGRAMMING LAB

Course Objectives

1. Understand fundamentals of programming such as variables, conditional and iterative execution, APIs etc.
2. Understand fundamentals of object oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
3. Have the ability to write computer programs to solve specific problems.
4. Be able to use the Java SDK environment to create, debug and run Java programs.

Course Outcomes:

After successful completion of this course, the students should be able to

CO01: Identify classes, objects, members of a class and the relationships among them for a specific problem.

CO02: Develop programs using appropriate packages for Inter –thread Communication and Synchronization.

CO03: Develop GUI applications to handle events.

CO04: Develop client server based applications.

CO05: Design, develop, test and debug Java programs using object-oriented principles in conjunction with development tools including integrated development environments.

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S	M	M									
CO02		M	M									
CO03		M	M		M							
CO04		M	M									
CO05		M	M		M				M			

Course Assessment methods:

Direct	Indirect
1.Model Exams 2. End Semester Exam 3.Viva Voce 4. Record Book 5. Observation	Course End Survey

S.No.	List of Practical Programs - Application
1.	Determining the order of numbers generated randomly using Random Class.
2.	Implementation of Point Class for Image manipulation
3.	Usage of Calendar Class and manipulation
4.	String Manipulation using Char Array
5.	Database Creation for string e-mail address and manipulation
6.	Usage of Vector Classes
7.	Implementing Thread based applications and Exception Handling (Synchronization and a synchronization)
S.No.	**List of Practical Programs - Applets**
8.	Working with frames and various controls.
9.	Working with Dialogs and Menus
10.	Working with Panel and Layout

TOTAL : 30 Hours

MCA3L2 - VISUAL PROGRAMMING LAB

Course Objectives

- Understand fundamentals of programming such as variables, conditional and iterative execution, APIs etc.
- Understand fundamentals of basic tools and controls.
- Have the ability to write computer programs to solve specific problems.
- Be able to use the SDI environment to create, debug and run programs.

Course Outcomes

After successful completion of this course, the students should be able to

CO01 : Understand the Visual Basic programming language in the aspects of designing, coding and implementation.
CO02 : Know about new ideas and advances, techniques, and tools and to use them effectively.
CO03: Develop client server based applications.
CO04: Design, develop, test and debug VB programs using SDI development environments.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02	S		M		S							
CO03		S										
CO04	M	M			S							

Course Assessment methods:

Direct	Indirect
1.Model Exams 2. End Semester Exam 3.Viva Voce 4. Observation 5. Record Book	Course End Survey

S.No.	List of Practical Programs
1.	SDI
2.	MDI
3.	Drawing inside View Windows, Device Context
4.	Message Map
5.	Event Handling
6.	Graphics Devices, Colors and Fonts
7.	Dialog Controls
8.	Static and Dynamic Controls
9.	Creating Pop-Up menus
10.	Tool Bar and Status Bar
11.	SDI with Serialization

Total : 30 Hours

MCA401 - DATABASE TECHNOLOGY

Objectives:-

To provide students with basic concepts in information system and the benefits with these systems in modern society.

To differentiate between data, information, and knowledge.

To understand several requirement and operations that the analyst needed to analyze, design, and implement the systems in what is called system development life cycle (SDLC)

COURSE OUTCOMES:

CO01: Define the fundamental elements of database management systems.
CO02: Explain the basic concepts of relational data model and entity-relationship model.
CO03: Outline relational database design, relational algebra and database language SQL.
CO04: Explain the basic concepts of query processing, transaction management and file storage.
CO05: Develop a database for a given problem.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02	M	M										
CO03	M	S										
CO04	M											
CO05			S									

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Mini Project	Course End Survey Quiz Online test Alumni

UNIT I : INTROUDCTION **9**

Database concepts / basic concepts / constraints / keys ER diagram / reduction or ER schema / UML/ design of an ER database schema / relational model / relational algebra / views / relational database / SQL / structure / set quotation / sub queries / join relation / DDL / DML / embedded SQL,QBE.

UNIT II : INTEGRITY AND SECURITY **9**

Integrity & security / domain constraints / referential integrity / assertion / triggers / authorization in SQL / relational database design / 1, 2, 3, 4, BCNF normal forms / decomposition

UNIT III : OBJECT RELATIONAL DATA MODEL **9**

Object relational data model / nested relations / complex types / inheritance / reference / types / querying with complex / types / functions & procedures / object oriented versus object relational / intro to xml concepts.

UNIT IV: STORAGE AND FILE STRUCTURE **9**

Storage and file structure / physical storage media / file organization, data dictionary storage, query processing / selection operation / sorting / join operation transaction / concepts / state / atomicity and amiability / Serialisability / transaction definition in sql / concurrency control / protocols / protocols / deadlock handling

UNIT V : SYSTEM ARCHITECTURE **9**

Database system architecture / centralized & client server architecture / server system architecture / case study / oracle.

Total : 45 Hours

Text Book:

1. **Silb**erschatz, H.F. Korth and S. Sudharshan, 2006, Database System Concepts, 5th Edition, Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

1. Silbersehatz, h.f. korth and sudharshan / database system concepts / iv ed / mcgraw hill

2. Jeffrey .d. ullman / principles of database systems / galgotia C.J.date / an introduction to database system / 3 ed

MCA402 – WEB TECHNOLOGY

Course Objectives:

- Choose the various steps in designing a creative and dynamic website.
- They will able to write html, JavaScript, CSS and applet codes.
- They will have clear understanding of hierarchy of objects in HTML and XML.
- Finally they can create good, effective and customized websites.

Course Outcomes
After successful completion of this course, the students should be able to

CO01: Know regarding internet related technologies. Systematic way of developing a website.
CO02: Design dynamic and interactive web pages by embedding Java Script code in HTML.Use Java Script to validate user input.
CO03: Know the advantages and use of different types of CSS. Efficiently write Java applets.
CO04: Understand the HTML and XML DOM. Know how to use Dynamic HTML.
CO05: Use CGI and Perl. Understand the fundamentals of VB Script, ASP, AJAX & Web Hosting.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S		S							S		
CO02		M	S									
CO03	S	M										S
CO04			S					M				
CO05	M						S					

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam	Course End Survey Quiz Online test Alumni

UNIT I INTRODUCTION 9

Basic Web Concepts - How the web server works – static web pages-Dynamic web pages-How scripting languages work – Server side scripting Language – Client Side Scripting – Introduction to Common HTML

UNIT II HTML 9

Links and Addressing –Linking in HTML –Images and Anchor –HTML and Images –HTML Image Basics – ALT Attributes – Image Alignment – HSPACE and VSPACE – HEIGHT and WIDTH –Layout with Tables – Introduction Tables – Simple Tables – ROWSPAN and COLSPAN – Tables for Layout– Frames – Simple Frame Example-Forms – Form Controls-Text Controls-Additional <Input> Type- New and Emerging Form Elements – <Button Elements>-Labels.

UNIT III JAVA SCRIPT 9

Core Java Script – Variables-Constant – Experssions Conditions- Relational Operators- Data Types – FlowControl – Functions-Objects – Data type Conversion & Equality – Windows and Frames – Forms and data.

UNIT IV XML 9

Characteristics of Markup Languages- Examples of Markup Languages-What is XML – The data revolution-Breaking beyond data display-Well Formed Documents - Valid Documents - Writing DTDs - Styling XML – XSL.

UNIT V VB SCRIPT 9

VB Script- Operators-Math Functions-Date and Functions-Unsupported array functions and statements-Unsupported string functions, statements and constructs-String Constants-Conversion Functions- Unsupported Conversion Functions.

Total : 45 Hours

TEXT BOOKS

1. Professional Java Script 2nd Edition – April 2002 (Chapter 2,4,5)
2. Eric Ladd, Jim O'Donnel –"**Using HTML 4, XML and JAVA**"-Prentice Hall of India - 1999.

REFERENCE BOOKS

1. "**Web Server Programming** "– Nail Grey –Wiley Publications –2004.
2. HTML BLOCK BOOK.
3. Professional IBM Websphere 5.0 – Tim Francis , Eric Harness –SPD Publications –2003

4. "**Beginning Java Script** " – Paul Wilton – SPD Publications –2001.

MCA403 - SOFTWARE PROJECT MANAGEMENT

Course Objectives:-

To provide basic project management skills with a strong emphasis on issues and problems associated with delivering successful IT projects

Course Outcomes:

After successful completion of this course, the students should be able to

CO01: It Enables the students understand what is a product, project and process is.

CO02: It enables students understand the lifecycle for a software project.

CO03: It enables students understand how the quality of a software product is calculated.

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01			S						S			
CO02			S			S					S	
CO03									S		S	

Course Assessment methods:

Direct	**Indirect**
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam	Course End Survey Quiz Online test Alumni

UNIT I : INTRODUCTION **9**

Introduction to Competencies - Product Development Techniques - Management Skills - Product Development Life Cycle - Software Development Process and models - The SEI CMM - International Organization for Standardization.

UNIT II : DOMAIN PROCESSES **9**

Managing Domain Processes - Project Selection Models - Project Portfolio Management - Financial Processes - Selecting a Project Team - Goal and Scope of the Software Project - Project Planning - Creating the Work Breakdown Structure - Approaches to Building a WBS - Project Milestones - Work Packages - Building a WBS for Software.

UNIT III : SOFTWARE DEVELOPMENT **9**

Tasks and Activities - Software Size and Reuse Estimating - The SEI CMM - Problems and Risks - Cost Estimation - Effort Measures - COCOMO: A Regression Model - COCOMO II - SLIM: A Mathematical Model - Organizational Planning - Project Roles and Skills Needed.

UNIT IV : SCHEDULING ACTIVITIES **9**

Project Management Resource Activities - Organizational Form and Structure - Software Development Dependencies - Brainstorming - Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling.

UNIT V : QUALITY ASSURANCE **9**

Quality: Requirements – The SEI CMM - Guidelines - Challenges - Quality Function Deployment - Building the Software Quality Assurance - Plan - Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools - Benefits - Legal Issues in Software - Case Study.

Total : 45 Hours

TEXT BOOK:

1. Robert T. Futrell, Donald F. Shafer, Linda I. Safer, “Quality Software Project Management”, Pearson Education, Asia, 2002.

REFERENCE BOOKS:

1. Pankaj Jalote, “Software Project Management in Practice”, Addison Wesley, 2002.

2. Hughes, “Software Project Management, 3/E”, Tata McGraw-Hill, 2004.

MCA4L1 - WEB TECHNOLOGY LAB

Course Objectives:

- Choose best technologies for solving web client/server problems
- Create conforming web pages
- Use JavaScript for dynamic effects
- Use JavaScript to validate form input entry
- Use appropriate client-side or Server-side applications
- Write Perl/CGI scripts

Course Outcomes
After successful completion of this course, the students should be able to

CO01: Understand, analyze and apply the role of languages like HTML, DHTML, CSS, XML, JavaScript, VBScript, ASP, PHP and protocols in the workings of the web and web applications

CO02: Analyze a web page and identify its elements and attributes.

CO03: Create web pages using HTML, DHTML and Cascading Styles sheets.

CO04: Create dynamic web pages using JavaScript and VBScript (client side programming).

CO05: Create interactive web applications using ASP.NET.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

	Programme Outcomes(POs)											
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	M	M										
CO02	M	M										
CO03		M	M	S								
CO04		M	M									
CO05		S	S									

Course Assessment methods:

Direct	**Indirect**
1. Model Exams 2. End Semester Exam 3.Viva Voce 4. Observation 5. Record Book	Course End Survey

S.No.	List of Practical Programs
1.	Create a simple page introducing your-self, how old you are, what you do, what you like and dislike. Modify the introduction to include a bullet list of what you do and put a list on the 5 things you like most and dislike is numbered lists. Create another page about your favorite hobby, and link it to (and from) your main page. Center something, and put a quote on one of your pages.
2.	Put an existing image on a web page. Create a table, use a heading and at least one use of row span / col span. Colour a page and some text within the page. Link to another site.
3.	Create a new file called index.html.
	a. Put the normal HTML document structure tags in the file.
	b. Give a title.
	c. At the bottom of the page (i.e. the last thing between the body tags) put the following:
4.	A horizontal rule.
5.	A link to your email-address (with your name between the tag); remember to put the link to your email address within address tags.
6.	A line break.
7.	The Date (I have this same structure at the bottom of this page)
8.	Above this Block (which is called the footer), put a title in heading tags.
9.	Add some text describing you. (You can split this into multiple headings and paragraphs if you want).
10.	Write a script to create an array of 10 elements and display its contents.

TOTAL: 30 Hours

MCA4L2 - SOFTWARE DEVELOPMENT LAB

Course Objective

1. An understanding of creating User Interface using HTML , CSS and Javascript.
2. An understanding of implementation issues such as coding standards.
3. An understanding of Client side scripting Language and Server side scripting language.
4. An understanding of Developing Java Application.
5. An understanding on quality control and how to ensure good quality software.
6. Development of significant teamwork and project based experience.

Course Outcomes

After successful completion of this course, the students should be able to

CO01: Students will understand the overall procedure of development of the Project.

CO02: Students will be able to understand the each step and different methodologies.

CO03: Software development process easy to all the methods.

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

	Programme Outcomes(POs)											
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	M	M										
CO02	M	M						M				
CO03		M		S								

Course Assessment methods:

Direct	Indirect
1. Model Exams 2. End Semester Exam 3.Viva Voce 4. Observation 5. Record Book	Course End Survey

S.No.	List of Practical Programs
1.	Library Information Processing.
2.	Students Mark Sheet Processing.
3.	Telephone Directory maintenance.
4.	Gas Booking and delivery system.
5.	Electricity Bill Processing.
6.	Bank Transactions.
7.	Pay Roll Processing.
8.	Inventory
9.	Question Database and conducting Quiz.
10.	Purchase Order Processing.

TOTAL : 30 Hours

MCA501 - MULTIMEDIA SYSTEMS

Course Objectives:-

- To give an overall view of multimedia tools.
- To understand and differentiate text, image, video & audio

Course Outcomes
After successful completion of this course, the students should be able to
CO01. Design and implement an animation for various themes.
CO02. Prepare multimedia advertisement.
CO03. Edit image

CO/PO Mapping
S – Strong, M – Medium, W – Weak

COs	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02												
CO03		M		S								

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

UNIT-1 INTRODUCTION **9**

Definitions - CD - Rom and the multimedia highway - where to use multimedia - Introduction - to making multimedia : The stages of a project - What you need - Multimedia skills and Training : The team - Macintosh and windows production platforms: Macintosh versus PC - The Macintosh platform - The windows Multimedia PC Platform - Networking Macintosh and windows computers - Hardware peripherals - Connection - Memory and stage Devices - Input Devices-Output Hardware - Communication Devices.

UNIT-II FUNDAMENTAL TOOLS OF MULTIMEDIA **9**

Basic Tools - Text editing and word processing Tools- OCR Software - Painting and Drawing Tools - 3-D Modeling and Animation Tools - Image - Editing Tools - Sound Editing Tools - Animation, Video and Digital Movie Tools - Helpful Accessories- Making Instant Multimedia - Linking Multimedia Objects - Office - Suites - Word Processors - Spreadsheets - Databases - Presentation Tools - Multimedia Authoring Tools: Types of Authoring Tools - cards -and- Page - Based Authoring Tools - Icon - Based Authoring Tools - Time Based Authoring Tools-Object - Oriented Authoring Tools - Cross Platform Authoring Notes.

UNIT-III COMPONENTS OF MULTIMEDIA **9**

Text: The Power of meaning: About fonts and Faces - Using Text in Multimedia - Computers and text - Font Editing and Design Tools - Hypermedia and Hypertext -Sound: The Power of Sound- Multimedia System Sounds - MIDI Versus Digital Audio -Digital Audio - Making MIDI Audio - Audio File formats - Working with sound on the Macintosh - Notation Interchange file Format (NIFF) - Adding sound to your multimedia Project - Toward Professional sound : The Red Book standard - Production Tips.

UNIT-IV IMAGES- AND ANIMATION **9**

Images: Making still Images - colours - Image File formats - Animation: The Power of Motion - Principles of Animation - Making Animations that work - Video: Using Video - How Video works Broadcast Video standards - Integrating Computers and Television - shooting and Editing video - Video Tips - Recording formats -Digital Video.

UNIT-V PROJECT PLANNING AND MAINTENANCE **9**

Planning and Costing: Project Planning - Estimating - REPs and Bit Proposals - Designing and producing - Designing - Producing - Content and Talent: Acquiring content - Using content created by others - Using Talent - Delivering : Testing - Preparing for Delivery - Delivering on CD-Rom - Compact Disc Technology - Wrapping It up - Delivering on the World wide web.

Total : 45 Hours

TEXT BOOKS:

1. Tay Vaughan - "Multimedia Making it Work" - Fourth Edition Tata McGraw Hill Edition -1999.
2. Walterworth John A - "Multimedia Technologies and Application"-Ellies Horwod Ltd - London -1991.

REFERENCE BOOKS:

1. John F Korgel Buford -"Multimedia Systems"-ACM press, 2001
2. Rajneesh Agarwal, Bharath Bhushan Tiwari – Excel books,2000
3. Erik Holsinger-“How Multimedia works”, Ziff davis Press 1994.

MCA502 - COMPUTER NETWORKS

Course Objectives

- ☐ Understand the theoretical concepts used in the present day computer networks.
- ☐ Understand the design of wireless, cellular and adhoc networks.
- ☐ To have hands on experience with the protocol analyzer and simulation tools.

Course Outcomes

After successful completion of this course, the students should be able to

CO01. Identify the various computer network protocol design models and the usage of various types of transmission
media and working of LAN technology.

CO02.Understand the IP addressing, routing, congestion control and flow control concepts.

CO03. Understand the various network applications and the supporting protocols.

CO04.Familiarize the various wireless LAN concepts and the design of adhoc wireless network.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	Programme Outcomes (POs)											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02												
CO03		M		S								
CO04												

Course Assessment Methods:

Direct		Indirect	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

UNIT I: INTRODUCTION **12**

Introduction – Network Hardware – Software – Reference Models – OSI and TCP/IP models – Example networks: Internet, ATM, Ethernet and Wireless LANs - Physical layer – Theoretical basis for data communication - guided transmission media

UNIT II:WIRELESS TRANSMISSIN **12**

Wireless transmission - Communication Satellites – Telephones structure –local loop, trunks and multiplexing, switching. Data link layer: Design issues – error detection and correction.

UNIT III:DATA LINK LAYER **12**

Elementary data link protocols - sliding window protocols – Data Link Layer in the Internet - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols.

UNIT IV: NETWORK LAYER **12**

Network layer - design issues - Routing algorithms - Congestion control algorithms – IP protocol – IP Address – Internet Control Protocol.

UNIT V :TRANSPORT LAYER **12**

Transport layer - design issues - Connection management - Addressing, Establishing & Releasing a connection – Simple Transport Protocol – Internet Transport Protocol (TCP) - Network Security: Cryptography.

Total : 45 Hours

Recommended Texts

1. S.Tanenbaum, 2003, Computer Networks, Fourth Edition, - Pearson Education, Inc, (Prentice hall of India Ltd), Delhi.

Reference Books

1. B. Forouzan, 1998, Introduction to Data Communications in Networking, Tata McGraw Hill, New Delhi.
2. F. Halsall, 1995, Data Communications, Computer Networks and Open Systems, Addison Wesley.
3. D. Bertsekas and R. Gallagher, 1992, Data Networks, Prentice hall of India, New Delhi.
4. Lamarca, 2002, Communication Networks, Tata McGraw Hill, New Delhi.

MCA503 - PROGRAMMING IN ASP.NET

Objectives:-

Giving the students the insights of the Internet programming and how to design and implement complete applications over the web. It covers the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side Programming, Server-Side Programming, Active Server Pages, and Database Connectivity to web applications.

Course Outcomes:-

CO01- Apply knowledge learned in this course as well knowledge earned from previous courses.
CO02 -To design an almost error-free database structure to reflect the automated system.
CO03 -Use the development products of Microsoft Visual Studio.Net® products
CO04- To implement and connect the automated system to a database stored on a web server.
CO05- Learn how to link and publish Visual Studio.Net® applications to reflect a web application.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02												
CO03		M		S								
CO04												
CO05												

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

UNIT I INTRODUCTIONTO .NET FRAMEWORK 9

Genesis of .Net – Features of .Net - .Net binaries – Microsoft Intermediate Language – Meta Data - .Net types and .net name spaces – Common Language Runtime – Common Type System – Common Language Specification - .Net Applications using command line compiler and visual studio .net IDE.

UNIT II BASICS OF ASP. NET 9

Introducing ASP .NET – Creating and deploying ASP .NET applications – Web forms – Web controls – working with events – Rich web controls – Custom web controls – Validation controls – Debugging ASP .NET pages.

UNIT III ADVANCED ASP .NET 9

ASP .NET configuration – Business objects – HTTP Handlers – Caching in ASP .NET – ASP .NET security – Localizing ASP .NET applications – Deployment projects.

UNIT IV BUILDING WEB SERVICES 9

Introduction to web services – Web services Infrastructure – SOAP – Building a web service – Deploying and publishing web services – Finding web services – Consuming web services.

UNIT V ADO .NET 9

Basics of ADO .NET – Changes from ADO – Data Table – Data Views – Data Set – Data Relation Type – ADO .NET Managed Providers – OlEDB and SQL Managed Providers – OlEDB Data Adapter Type.

Total : 45 Hours

TEXT BOOKS:

1. Andrew Troelsen – **"C# and the .Net Platform"** – Apress – 2001.(Unit I and II)
2. Mridula Parihar, et. al. – **"ASP .NET Bible"** – Wiley-dreamtech India Pvt. Ltd. – 2002.

REFERENCE BOOKS:

1. David S. Platt – **"Introducing .Net"** – Microsoft Press – 2002.
2. Alex Homer et. al. – **"Professional ASP .NET 1.1"** – Wiley-dreamtech India Pvt. Ltd. – 2004.
3. Rebecaa M. Riordan – **"ADO .Net step by step"** - Microsoft Press.

MCA5L1 - ASP.NET LAB

Course Objective

1. An understanding of creating User Interface using.NET , CSS and Javascript.
2. An understanding of implementation issues such as coding standards.
3. An understanding of Client side scripting Language and Server side scripting language.
4. An understanding of Developing Java Application.
5. An understanding on quality control and how to ensure good quality software.
6. Development of significant teamwork and project based experience.

Course Outcomes:-

CO01 - Apply knowledge learned in this course as well knowledge earned from previous courses.
CO02 - To design an almost error-free database structure to reflect the automated system.
CO03 - Use the development products of Microsoft Visual Studio.Net® products
CO04 - To implement and connect the automated system to a database stored on a web server.
CO05 - Learn how to link and publish Visual Studio.Net® applications to reflect a web application.

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

	Programme Outcomes(POs)											
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S	M										
CO02	M											
CO03				S	S							
CO04			M		S							
CO05		S	S		S							

Course Assessment methods:

Direct	Indirect
1. Model Exams 2. End Semester Exam 3.Viva Voce 4. Observation 5. Record Book	Course End Survey

S.No.	List of Practical Programs
1.	Working with MSIL, Metadata and Namespace
2.	Usage of CLR, CTS and CLS.
3.	.Net application using command line complier.
4.	.Net application using visual studio .net IDE.
5.	Simple ASP .Net Applications.
6.	Creating web forms application projects.
7.	Usage of web controls.
8.	Working with events
9.	Usage of Rich web controls.
10.	Usage of validation controls

Total : 30 Hours

CORE ELECTIVES

Core Elective I : COMPUTER GRAPHICS

Course Objectives:-

Students will begin to understand what visual communications are and how they have developed over history. Students will learn basic theoretical tools with which to engage with the various forms of visual culture that are increasingly prevalent in society. Students will understand viewers' practices of looking, or how an audience responds to visual culture.

Course Outcomes:-
After successful completion of this course, the students should be able to

CO01: Know and be able to describe the general software architecture of programs that use 3D computer graphics.
CO02: Know and be able to discuss hardware system architecture for computer graphics. This includes, but is not limited to: graphics pipeline, frame buffers, and graphic accelerators/co-processors.
CO03: Know and be able to use a current 3D graphics API (e.g., OpenGL or DirectX).
CO04: Know and be able to use the underlying algorithms, mathematical concepts, supporting computer graphics.
CO05: Composite 3D homogeneous matrices for translation, rotation, and scaling transformations.

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02		M										
CO03			M		S							
CO04	S				M							M
CO05					S							S

Course Assessment methods:

Direct	Indirect
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam 5. Lab Exercise	Course End Survey Quiz Online test Alumni

UNIT 1: 9

Introduction to graphic devices - picture representation, display devices , display adapters, Types of printers , Plotters & input devices

UNIT 2: 9

Transformations - Basic 2D & 3D transformations - translation , scaling , rotation , reflection, shearing, Multiple transformations, Rotation about an axis parallel to a coordinate axis, Rotation about an arbitrary axis in space, Affine and perspective Geometry , Orthographic projections and Axonometric projections

UNIT 3: **9**

Raster Scan Graphics - Bresenham's line and circle drawing algorithms, scan conversion, RLE, Frame buffer, Scan converting polygons - Edge fill and Seed fill algorithms, Anti aliasing and Half toning

UNIT 4: **9**

Clipping and Display file Compilation - Sutherland - Cohen line clipping algorithm, Windowing and View porting - Segmented display file, structure and compilation. - Hidden Surface and hidden Line Removal - Backface removal algorithm, Z- buffer, Warnock algorithm, Hidden line elimination.

UNIT 5: **9**

Plane Curves and Space Curves - Curve Representation, Non-parametric and parametric curves, representation of space curves, Cubic Spline, Parabolic Blended curves, Bezier curves and B-spline curves.

Total : 45 Hours

Recommended Text Books

1. D. F. Rogers, J. A. Adams, 2002, Mathematical elements for Computer Graphics, 2nd Edition, Tata McGraw-Hill, New Delhi.

Core Elective I : OBJECT ORIENTED ANALYSIS AND DESIGN

Objectives:

Understand basic OO concepts such as types, inheritance and interfaces, know how to use them.
Understand OO analysis and design and its difference from structured design.
Develop a gut feel for OO do's and don'ts
Use the UML as a modeling and communications tool
Create use cases to document requirements

Course Outcomes:-

CO01: create use cases to document requirements
CO02: create a static conceptual model of your system
CO03: create a dynamic behavioral model of your system
CO04: Use design patterns to refine your model
CO05: understand what a software development process is and why it is important

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								
CO05			S									

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

UNIT-I INTRODUCTION **9**

System Development - Object Basics - Development life cycle - Methodologies-Patterns – Frameworks- Unified Approach -UML.

UNIT-II CLASS AND OBJECT **9**

Use - Case Models - Object Analysis - Object relations - Attributes – Method - Class and object responsibilities - case studies.

UNIT-III DESIGN PROCESSING **9**

Design Processes - Design Anxious - class design - Object Storage - Object interoperability - Case Studies.

UNIT-IV USER INTERFACE DESIGNING **9**

User interface Design -View layer classes – Micro - level Processes - View layer Interface - Case Studies.

UNIT-V TESTING AND DEBUGGING **9**

Quality Assurance Tests - Testing Strategies - Object orientation of testing -Test Cases - Test Plans - Continuous testing – Debugging Principles - System usability -Measuring user satisfaction -Case studies.

Total : 45 Hours

TEXT BOOKS:

1. Ali Bahrami – "Object Oriented System Development" – McGraw Hill International Edition -1999.
2. R. S. Pressman - "Software Engineering" - Fourth Edition - McGraw Hill international Edition - 1997.

REFERENCE BOOKS:

1. Pierre – Alain Miller – "instant UML"-Work Press-1997.
2. Grady Booch, James Rumbaugh,Ivar Jacobson, "The Unified Modeling Language, User Guide", Addison-Wesley Longman, 1999.
3. Graig Larman,"Applying UML and Patterns", Addison Wesley, 2000.

Core Elective I : IMAGE PROCESSING

Objectives:

Develop a theoretical foundation of fundamental Digital Image Processing concepts.
Provide mathematical foundations for digital manipulation of images; image acquisition; preprocessing; segmentation;
Fourier domain processing; and compression.
Gain experience and practical techniques to write programs using MATLAB language for digital manipulation of images;
Image acquisition; preprocessing; segmentation; Fourier domain processing; and compression.

Course Outcomes:-

CO01: To understand (i.e., be able to describe, analyse and reason about) how digital images are represented, manipulated, encoded and processed
CO02: emphasis on algorithm design, implementation and performance evaluation
CO03: Apply principles and techniques of digital image processing
CO04: in applications related to digital imaging system design and analysis.
CO05: Analyze and implement image processing algorithms

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								
CO05			S									

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

UNIT I : FUNDAMENTALS OF IMAGE PROCESSING : 9

Image Acquisition, Image Model, Sampling, Quantization, Relationship between pixels, distance measures, connectivity , Image Geometry, Photographic film. Histogram: Definition, decision of contrast basing on histogram, operatio ns basing on histograms like image stretching, image sliding, Image classification. Definition and Algorithm of Histogram equalization.

UNIT II : IMAGE TRANSFORMS : 9

A detail discussion on Fourier Transform, DFT,FFT, properties A brief discussion on WALSH Trans form , WFT, HADAMARD Transform, DCT. **IMAGE ENHANCEMENT** : (by SPATIAL Domain Methods) Arithmetic and logical operations, pixel or point operations, size operations - Smoothing filters-Mean, Median, Mode filters – Comparative study - Edge enhancement filters – Directorial filters, Sobel, Laplacian, Robert, KIRSCH Homogeneity & DIFF Filters, prewitt filter, Contrast Based edge enhancement techniques. – Comparative study - Low Pass filters, High Pass filters, sharpening filters. – Comparative Study - Comparative study of all filters - Color image processing.

UNIT III : IMAGE ENHANCEMENT : 9

(By FREQUENCY Domain Methods) -esign of Low pass, High pass, EDGE Enhancement, smoothening filters in Frequency Domain. Butter worth filter, Homomorphic filters in Frequency Domain Advantages of filters in frequency domain, comparative study of filters in frequency domain and spatial domain. **IMAGE COMPRESSION: DEFINITION**: A brief discussion on – Run length encoding, contour coding, Huffman code, compression due to change in domain, compression due to quantization Compression at the time of image transmission. Brief discussion on:- Image Compression standards.

UNIT IV : IMAGE SEGMENTATION: 9

Definition, characteristics of segmentation. Detection of Discontinuities, Thresholding Pixel based segmentation method. Region based segmentation methods – segmentation by pixel aggregation, segmentation by sub region aggregation, histogram based segmentation, spilt and merge technique. Use of motion in segmentation (spatial domain technique only)

UNIT V: MORPHOLOGY: - 9

Dilation, Erosion, Opening, closing, Hit-and-Miss transform, Boundary extraction, Region filling, connected components, thinning, Thickening, skeletons , Pruning Extensions to Gray – Scale Images Application of Morphology in I.P

Total : 45 Hours

Text Book:

Digital Image Processing, Rafael C. Gonzalez and Richard E. Woods Addision Wesley

Reference books:

1. Fundamentals of Electronic Image Processing by Arthyr – R – Weeks, Jr. (PHI)
2. Image processing, Analysis, and Machine vision by Milan Sonka vaclan Halavac Roger Boyle, Vikas Publishing House.

Core Elective II : SOFTWARE TESTING

Objectives:-

- To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- To discuss various software testing issues and solutions in software unit test; integration, regression, and system testing.
- To learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.

Course Outcomes:-

CO01 -Have an ability to apply software testing knowledge and engineering methods.
CO02- Have an ability to design and conduct a software test process for a software testing project.
CO03- Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation**.**
CO04 -Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
CO05 - Have an ability to use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02												
CO03		M		S								
CO04												
CO05												

Course Assessment Methods:

Direct		Indirect	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

UNIT I Introduction **9**

Software testing – Role of software testing – A structural approach to testing – Test strategy – Methods for developing test strategy Testing methodologies.

UNIT II Life Cycle Testing Approach 9

Test Plan – Requirements testing – Walk through test tool – Risk Matrix test tool – Testing for requirements phase and design phase – Design renew test tool – Test data and volume test tools.

UNIT III Installation 9

Installation phase testing – Tools for acceptance test – Software acceptance process – Software maintenance – Methodologies for testing – Training and change installation.

UNIT IV Testing Methods **9**

Tools and techniques – Cost estimate – For testing – Testing phase of life cycle – Point accumulation tracking system – Performance analysis of testing – Inspection plan and test plan documents.

UNIT V Testing Strategies 9

Rapid Prototyping – Spiral testing – Tool Selection Processes – Structural system Testing – documentation of test results – Test effectiveness evaluation – Test measurement process – Test metrics.

Total : 45 Hours

TEXT BOOKS:

1. William Perry, “Effective Methods for Software Testing”, John Wiley & Sons, USA, 1995.

2. Ron Patton, “Software Testing”, Techmedia.

Core Elective II : AD HOC NETWORKS

Objectives:

Advances in wireless local-area network technology (typically based on IEEE 802.11).
For reliable transmission of real-time multimedia information over distributed mobile ad hoc networks (MANET).
The objective of this project is to test and evaluate the performance of MANET for safety communications and tactical operations.
In particular, by providing diversity cooperative transmission can indeed increase throughput as well as transmission coverage.
In this study we will specifically concentrate on the synchronization aspects

Course Outcomes:-

CO01 : I have conducted an in-class evaluation for my course as shown in Tables II and III
CO02 The students have been told this is self- and none-official evaluation that is meant to improve the learning and teaching process for the course
CO03: It has nothing to do with their grades
CO04: The evaluation sheets were collected by one of the students. I am very pleased with the achievement obtained in this course
CO05: More precisely, I am very pleased with the research project they have performed.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								
CO05												

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

UNIT I : INTRODUCTION **9**

Introduction-Fundamentals of Wireless Communication Technology - The Electromagnetic Spectrum - Radio Propagation Mechanisms - Characteristics of the Wireless Channel - IEEE 802.11a,b Standard – Origin Of Ad hoc: Packet Radio Networks - Technical Challenges - Architecture of PRNETs - Components of Packet Radios – Ad hoc Wireless Networks -What Is an Ad Hoc Network? Heterogeneity in Mobile Devices - Wireless Sensor Networks - Traffic Profiles - Types of Ad hoc Mobile Communications - Types of Mobile Host Movements - Challenges Facing Ad Hoc Mobile Networks-Ad hoc wireless Internet

UNIT II : AD HOC ROUTING PROTOCOLS **9**

Introduction - Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks - Classifications of Routing Protocols -Table-Driven Routing Protocols - Destination Sequenced Distance Vector (DSDV) - Wireless Routing Protocol (WRP) - Cluster Switch Gateway Routing (CSGR) - Source-Initiated On-Demand Approaches - Ad Hoc On-Demand Distance Vector Routing (AODV) - Dynamic Source Routing (DSR) -Temporally Ordered Routing Algorithm (TORA) - Signal Stability Routing (SSR) -Location-Aided Routing (LAR) - Power-Aware Routing (PAR) - Zone Routing Protocol (ZRP)

UNIT III : MULTICASTROUTING IN AD HOC NETWORKS **9**

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

UNIT IV : TRANSPORT LAYER, SECURITY PROTOCOLS **9**

Introduction - 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 - TCP Over Ad Hoc Wireless Networks -Other Transport Layer Protocols for Ad Hoc Wireless Networks - Security in Ad Hoc Wireless Networks - Network Security Requirements - Issues and Challenges in Security Provisioning - Network Security Attacks - Key Management - Secure Routing in Ad Hoc Wireless Networks

UNIT V : QoS AND ENERGY MANAGEMENT **9**

Introduction - Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks - Classifications of QoS Solutions - MAC Layer Solutions - Network Layer Solutions - QoS Frameworks for Ad Hoc Wireless Networks Energy Management in Ad Hoc Wireless Networks –Introduction - Need for Energy Management in Ad Hoc Wireless Networks - Classification of Energy Management Schemes - Battery Management Schemes - Transmission Power Management Schemes - System Power Management Schemes

Total : 45 Hours

TEXT BOOK:

1. C. Siva Ram Murthy and B.S. Manoj “Ad Hoc Wireless Networks: Architectures and Protocols”, Prentice Hall PTR,2004

REFERENCE BOOKS:

1. C.K. Toh, Ad Hoc Mobile Wireless Networks: Protocols and Systems, Prentice Hall PTR ,2001
2. Charles E. Perkins, Ad Hoc Networking, Addison Wesley, 2000

Core Elective II :DATA MINING AND DATA WAREHOUSING

Course Objectives:-

The recent years have generated explosive expansion of digital data stored in computer databases as well as increased pressure on companies to keep competitive advantage. This has put Data Mining (DM) as a key method for extracting meaningful information from the flood of digital data collected by businesses, government, and scientific agencies.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to

CO01: Provide efficient distribution of information and easy access to data
CO02: Create user friendly reporting environment.
CO03: Find the unseen pattern in large volume of historical data that helps to mange an organization efficiently
CO04: Understand the concepts of various data mining Techniques

CO/PO Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO01	S											
CO02	S	M										
CO03		M							S		S	
CO04	S	M		M	S							

Course Assessment methods:

Direct	**Indirect**
1. Internal Tests 2. Assignments 3. Seminar 4. End Semester Exam	Course End Survey Quiz Online test Alumni

UNIT I Data Warehouse **9**

Data Warehouse roles and structures – What can a data warehouse do? The Cost of Warehousing data – Data Stores, Warehouses and Marts – The Data Warehouse environment – Data warehouse characteristics – The Data Warehouse architecture – Metadata, Metadata Extraction – Implementing the Data Warehouse – Designing and building the Data Warehouse – The data warehouse project plan – Data warehouse architecture, specification and development- Data Warehouse project success factors.

UNIT II Introduction to Data Mining: **9**

Basic Data Mining tasks – Data mining versus knowledge discovery in data bases – Data Mining issues – Data Mining Metrics – Social implications of data mining - Data Mining from a database perspective – Data Mining Techniques – Introduction – A statistical perspective on Data Mining – Similarity measures – Decision trees – Neural networks – Genetic algorithms.

UNIT III Classification **9**

Introduction – Statistical based algorithms – Distance based algorithms – Decision tree based algorithms – Neural networks based algorithms – Rule based algorithms – Combining Techniques.

UNIT IV Clustering **9**

Introduction – Similarity and distance measures – Outliers – Hierarchical algorithms – Partitional algorithms – Clustering large data bases – Clustering with categorical attributes – Association Rules – Introduction – Large Item – sets – Basic Algorithms.

U**NIT V Web Mining, Spatial Mining, Temporal Mining** **9**

Web Mining – Introduction – Web Content Mining – Web Structure Mining – Web Usage Mining. Spatial Mining – Introduction – Spatial Data: Overview – Spatial Data Mining primitives – Generalization and Specialization – Spatial Rules – Spatial Classification algorithm – Spatial Clustering Algorithms. Temporal Mining – Introduction – Modeling temporal events.

Total : 45 Hours

TEXT BOOKS:

1. Margaret H.Dunham. “Data Mining Introductory and Advanced Topics”. Pearson Education – 2003.
2. George M. Maracas’. “Modern Data Warehousing, Mining and Visualization: Core concepts”, Pearson Education – 2003.

NON MAJOR ELECTIVES

Non Major Elective I : ADVERTISING AND SALES MANAGEMENT

Objectives:

This course helps students develop basic understanding of the concept and theories of advertising and sales management and its applications in the real world. It also helps the students to understand about current practices in the field.

OUTCOMES:

CO01 - Identify advertising decision areas.

CO02 - Apply marketing communications functions such as advertising, direct marketing, the Internet, interactive media, and sales promotion.

CO03 - Research and evaluate a firm's marketing and promotional situation.

CO04 - Understand the implications of current trends in advertising and promotion.

CO05 - Develop an advertising campaign plan that reflects an integrated marketing communications (IMC) perspective.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								
CO05	S				M							

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit - I : **6**

Introduction To Advertising And History Of Advertising, Advertising Classification, Function And Benefits, Economic, Social And Ethical Issues In Advertising, Advertising Agency And Clients, Advertising Objectives And Budget Allocation

Unit - II : **6**

Media Planning And Strategy, , Planning An Advertising Campaign, Advertising Research Evaluation Of Media, Supporting Media - Outdoor, Cinema, Videos, Electronic Media Viz. TV, Radio, Print And Transit Advertising, & Internet - A Media Of New Millennium

Unit - III : **6**

Introduction To Sales Management, Nature & Scope Of Sales Management, Personal Selling And Selling And Salesmanship, Sales Management Strategy, Sales Related Marketing Policies Sales Organization, Recruitment, Selection And Training Of Sales Personnel

Unit - IV: **6**

Compensation And Motivation Of Sales Force, Monitoring Of Sales Force And Performance Appraisal Of Sales Force Internet As Emerging Selling Techniques, Direct Marketing, Relationship Marketing

Total : 30 Hours

Non Major Elective I : CALL CENTRE MANAGEMENT

OBJECTIVE:

The course has two objectives. First, to provide you with a systematic and critical understanding of organizational theory and research and the factors involved in the functioning and analysis of complex organizations. Second, to show how these ideas can serve as practical tools for the analysis and management of organizational situations. The topics covered in the course have been chosen to allow you to analyze the organizational context in which you find yourself, both to aid understanding and to provide an improved basis for action.

COURSE OUTCOMES

CO01. Understand the complexity of real life organization and management.
CO02. Develop and refine students' capacities for integrating multiple points of view.
CO03. Become independent and critical thinkers.
CO04. Achieve new insights and refine skills of interpretation.
CO05. Understand organization and management so that students can use this understanding as individuals in everyday organizational life.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S					S						
CO02			M									
CO03		M		S								
CO04				M								
CO05					M							

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit I : 6

Telephone Etiquette; Brief on American and British Culture / Accent: Political setup, culture inputs, Geographical Structure; Difference in work habits between US, UK and India; World Time Zones; Time management; Call Flow and Work Flow; American and Hispanic names; Interactive videos on US/UK English usage; Inbound / Outbound operation – an explanation; Telephone Tips; Winning Attributes of a customer service representative; Structure of a call; Listening and paraphrasing; Effective probing; Rapport and Empathy.

Unit II : **6**

ITES and Back Office function; Workflow Management; Workforce productivity system; Scanning ; Call center technology – PBX system features; IVR (Interactive Voice Response System); ACD (Automatic Communication Distributor System); Interaction Mail (unified Messaging and Voice Mail); Interaction Fax; Web Services; Software Phone; IPLC (International Private Leased Circuit Lines); VOIP; Dialers; Call Logger.

Unit III : **6**

Soft Skills : To maintain good customer relationships without face to face contact; Evaluate listening skills; How to translate Technical Jargon into better customer communication; Make success in sales.

Unit IV : . 6

Professional Telephone calling technique; Effective information gathering technique; Understanding customer competence levels; Effective telephone communication skills; Negotiation Technique; How to overcome objections; Compliments receiving; open ended/close ended questions; Probing questions; Call flow/process flow; Handling most difficult customers.

Unit V : 6

Quality Control Operations; Internal quality checks; External quality check summarizing and producing complete call reports – Default Interaction Client User Report; Line Usage Reports; User Reports; Call Reports; Queue Performance Reports; Performance Monitoring reports, Standard Report Logs, Custom Report Logs.

Total : 30 Hours

Text Book:

Name of the Book	Author	Publication	Year
Call Centre Training Course Kit (with CD)	Vikas Gupta	Dreamtech	2003
Call Centre Technology & Techniques	Jack A.Green	Thomson	2004

Reference Book:

Name of the Book	Author	Publication	Year
Call Centre Operations	Charles E Day	McGraw Hill (Part – III)	2000

Non Major Elective I : CUSTOMER RELATIONSHIP MANAGEMENT

OBJECTIVES

- Comprehensive and balanced understanding of Customer Relationship Management (CRM) strategy.
- Understanding of the analytics to gather customer feedback, measure consumer sentiment, customer buying trends and forecasting to improve company's marketing performance.
- Understanding of CRM technologies and the role of customer related data bases to the successful delivery of CRM outcomes.
- Understanding of customer portfolio management in B2B and B2C contexts

OUTCOMES:

CO01 - Acquire a deep understanding of how and why consumers make buying decisions.
CO02 - Undertake consumer research.
CO03 -Understand the role of consumer behavior in making marketing decisions.
CO04 -Understand how a person's inherent characteristics (e.g., personality, self-concept, motivation) influence the consumption process.
CO05 -Understand how a person's environment (e.g., reference groups, family, culture, etc.) affects consumption decisions.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								
CO05												

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

UNIT I - OVERVIEW 6

Retail industry and economy – emergence of organized retailing – trends in retail marketing - introduction to retail marketing – wheel of retailing– value of the customer – identification of customer needs- Indian Experience in Retailing – Impact of FDI in Indian Context.

UNIT II - RETAIL MARKET STRATEGY 6

Tactics to get new customers – traditional medial in retail marketing –strategies to turn first time buyer into a regular customer - strategies to turn a regular customer into a life time customer- Retail Marketing Mix- --Store Positioning - Definition of retail Market Strategy – Focus on the Customer – nature of Strategic Planning – Preplanning: SWOT – Mission – Goals and objectives –Budget implementation and control.

UNIT III - RETAIL MARKETING MIX 6

Retailing role – retail location strategy – trade area definition– Objectives of a Good Store Design– Store Layout – Types of Design – Feature Areas – Space Planning – Location of Departments -Location of Merchandising within Departments – Use of Plano grams – Leveraging Space : In Store Kiosks – Visual Merchandising –- Atmospherics– retail space management-- pricing – retail promotion strategy –seminars and projects.

UNIT IV—CRM- OVERVIEW 6

Relationship marketing – CRM – Components of e-CRM- e-CRM and various CRM Packages – the concept of CRM – strategic imperatives, Strategies for Building customer relationship and terminating customer relationship – Conceptual foundations of CRM –- Economics of CRM

UNIT V - CRM IMPLEMENTATION 6

CRM in B-C Markets – CRM in B-B market — product offerings in the CRM market space – contact centers for CRM – The CRM Road Map – Customer retention --Operational Issues in implementing in CRM

References:

1. Shainesh G and Jagdish N Sheth - Customer Relationship Management - Mac Millan - 2006.
2. Chetan Bajaj, Rajnish Tuli, Nidhi V Srivastava - Retail Management - Oxford University Press - 2005.
3. A Sivakumar - Retail Marketing - Excel Books - 2007.
4. A. Coskin Samli – Retail marketing strategy: Planning, Implementation and control, - Quorum Books - 1989.

Total : 30 Hours

Non Major Elective II :HUMAN RESOURCE MANAGEMENT

OBJECTIVES

To create and utilize an able and motivated workforce, to accomplish the basic organizational goals.

To establish and maintain sound organizational structure and desirable working relationships among all the members of the organization.

To secure the integration of individual or groups within the organization by co-ordination of the individual and group goals with those of the organization.

To create facilities and opportunities for individual or group development so as to match it with the growth of the organization.

To attain an effective utilization of human resources in the achievement of organizational goals.

OUTCOMES

CO01- Explain the human resources management process and its importance to organizational effectiveness

CO02- Identify various challenges facing the management of human resources

CO03 - Explain the strategic role of human resources management

CO04 - Describe and discuss factors influencing the individual-organizational relationship

CO05 - Communicate effectively through both oral and written presentations

CO06 - Work effectively as a team member through group projects, case studies and problem analysis

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								
CO05												
CO06		S			S							

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit – I: INTRODUCTION OF HUMAN RESOURCE MANAGEMENT 6

Definition – Importance of Human Resources – Objectives of Human Resources Management – Qualities of Personnel Managers- Evolution and growth of Personnel Management in India. Human Resources Policies: Need, type and Scope – Human Resource Planning: Long and short term Planning, Job analysis – Skills Inventory – Job Description and Job Specification.

Unit – II: RECRUITMENT AND SELECTION 6

Purposes, types and methods of recruitment and selection – Reduction of recruitment costs – Functions of Human Resources Management from Procurement to Separation – Placement, Induction, Transfers, Promotions Disciplinary actions, Termination of services – Resignation, Dismissal, Retrenchment and Voluntary Retirement Schemes, Exit Interviews, Prevention of employee turnover.

Unit – III: PERFORMANCE EVALUATION 6

Ranking, rating scales, critical incident method – MBO as a method of appraisal, job evaluation, criteria for promotions and job enrichment- Wages and salary Administration – Meaning, Calculation of Wages, Salary, and Perquisites – Compensation packages – Rewards and Incentives – Financial and non financial Incentives.

Unit – IV: EMPLOYEE'S SAFETY AND HEALTH 6

Employee's Safety and Health – Preventive approaches including health education, Audit of safety programs and safety training –Work - stress – Causes and Consequences – Stress – Management Programs –Personnel Office Management – Functions of the Office, correspondence, O & M in Personnel department, Maintenance of Personnel records.

Unit – V: TIME MANAGEMENT 6

Importance of Time Factor- Time waste – Prioritizing work Scheduling – Functions of the Time office – Flexible work arrangement

Total : 30 Hours

References:

1. L.M.Prasad – Human Resource Management – S. Chand & Sons – 2007.
2. C.B. Mamoria, S. V. Gankar - Personnel Management – Himalaya Pub. – 2002.
3. Gary Dessler - Human Resource Management – Prentice Hall – 8th Edition – 2000.
4. S.S. Khanka - Human Resource Management – S. Chand Ltd. – 2007.

Non Major Elective II :LOGISTICS AND SUPPLY CHAIN MANAGEMENT

OBJECTIVE:

To promote professional development of Logistics and Supply Chain Management

To encourage and enable continuous professional development

To serve as a resource centre for its members and parties interested in Logistics and Supply Chain Management

To advance, study and disseminate techniques and applications on Logistics and Supply Chain Management

OUTCOME:

CO01 - Logistics majors will be able to evaluate both domestic and international transportation problems and effectively develop and present actionable solutions.

CO02 - Logistics majors will be able to apply inventory models and techniques to create and recommend appropriate stocking solutions in various business settings.

CO03 - Logistics majors will evaluate and recommend warehouse and DC strategies, tactics, and systems to ensure companies efficiently and effectively manage their distribution processes at the regional, national, and international levels.

CO04 - Logistics majors will be able to identify and assess tradeoffs between the three key areas of transportation, inventory, and warehouse/DC management and recommend actionable plans and strategies.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit I **6**

Logistics management: - customer service and logistics management – a perspective - concepts in Logistics and Physical Distribution – Distribution inventory

Unit II **6**

Types of inventory control – demand forecasting – warehousing and stores management – routing – transportation management – commercial aspects in distribution management – codification – Distribution Channel Management – Distribution resource planning – Logistics in 21st Century

Unit III **6**

Supply Chain Management: Introduction – The need for supply chain – Understanding the supply chain management – Participants in supply chain – levels of supply chain.

Unit IV **6**

Role of Manager in supply chain – supply chain performance drivers – key enablers in supply chain improvement – Inter – relation between enablers and levels of supply chain management

Unit V **6**

Aligning the supply chain with business strategy – SCOR Model

Total : 30 Hours

References:

1. D K Agarwal - Textbook of Logistics and Supply Chain Management - MacMillan publishers (Eight impression) - 2009.
2. G Raghuram & N Rangaraj - Logistics and Supply Chain Management - Cases and Concepts. Mac Millan - 2000.
3. Martin Christopher - Logistics & Supply Chain Management: Creating Value-Adding Networks - FT Press – 4th edition.
4. Janat Shah - Supply Chain Management: Text and Cases – Pearson - 1st Edition.

Non Major Elective II : ENTREPRENEURSHIP DEVELOPMENT

OBJECTIVES:

- Entrepreneurship Majors will apply a working knowledge of the principles of entrepreneurship to analysis and problem solving.
- Entrepreneurship Majors will be able to create and start new ventures.
- Entrepreneurship Majors will know how to manage and grow new ventures.

OUTCOMEs:

C1- Ability to recognize a business opportunity that fits the individual student:
C2 -Demonstrate the ability to provide a self-analysis in the context of an entrepreneurial career
C3 -Demonstrate the ability to find an attractive market that can be reached economically
C4 - Demonstrate the understanding of how to launch the individual's entrepreneurial career:
C5 - Create appropriate a business model

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								
CO05												

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit-I: ENTREPRENEUR **6**

Concept of Entrepreneur-characteristics of an Entrepreneur- Distinction between and Entrepreneur and manager-functions of an Entrepreneur - types of entrepreneur**.**

Unit-II: WOMEN ENTREPRENEURSHIP **6**

Concept of women entrepreneurs-functions of women entrepreneurs-growth of women entrepreneurship, problems of women entrepreneurs

Unit-III: ENTREPRENEURIAL COMPETENCIES AND FACTORS **6**

Entrepreneurial Competencies and Factors - Meaning of Entrepreneurial competencies or trait-major entrepreneurial competencies-Developing Competencies- Economic factors-Non economic factors- government actions

Unit-IV: ENTREPRENEURSHIP DEVELOPMENT PROGRAMMES **6**

Need for EDP-objectives of EDP course contents and curriculum of EDP, Phases of EDP-Evaluation of EDP

Unit-V: ENTREPRENEURSHIP AND SMALL SCALE ENTERPRISES **6**

Opportunities for an Entrepreneurial career, role of small enterprises in economic development, problems of small scale enterprises

Total : 30 Hours

References:

1. Hisrich, -'Entrepreneurship' - Tata McGraw Hill, New Delhi – 6th edition - 2007.
2. P. Saravanavel, - 'Entrepreneurial Development' - Ess Pee Kay Publishing House – 1997.
3. S.S. Khanka - 'Entrepreneurial Development' - S. Chand and Company Limited – 2001.

OPEN ELECTIVES

Open Elective I :PHOTOGRAPHY & VIDEOGRAPHY

Objectives:

- Define the process, uses, principles and advantages of digital photography.
- Develop the concept of the basics of digital imaging, Raster & Vector Graphics, Resolution, Pixel depth, Aspect Ratio, Dynamic Range, File Formats, File Size, Image Compression etc.
- Understand the concept of basics of television networking.
- Understand the different types of video encoding system and types of video signals .
- Understand the techniques of scanning: interlace and progressive.

OUTCOME:

CO01 -Operate a digital camera; understand its features and how to use them in order to capture images.

CO02 - Use a digital camera to take pictures that demonstrate the ability to control and creatively manipulate depth of field, motion, light, frame and vantage point, and color.

CO03 -Use Adobe Photoshop for non-destructive image correction enhancement, manipulation, and creative interpretation of photographs.

CO04 - Recognize, appreciate, and utilize digital photography as a form of visual communication and expression and understand the creative choices made by other photographers.

CO05 – Understand the ethical and legal implications of image manipulation and appropriation.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (Pos)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								
CO05					M							

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit I : 6

Introduction to Digital Photography - Understanding film and paper photography - Learning about the digital revolution - Advantages and disadvantages of digital photography over film photography - Computers as photographic tools - How photos are used today.

Unit II : 6

Digital Basics - Digital image method of storing and processing digital image:Raster and Vector method - Representation of digital image: Resolution – Pixel Depth – PixelAspect Ratio – Dynamic Colour Range – File Size – Colour Models – Image Compression – File Formats – Calculating image resolution for outputs.

Unit III : 6

Introduction to television - Network from TV studio to home receiver. (Earth station via satellite-transponder to home receiver) - Foot print area, cable television network, interactive television - Direct to Home video(DTH) - Internet, web video, modulation and bands (VHF,UHF)

UNIT IV: 6

ELECTRONIC IMAGE -Different video encoding system (PAL, NTSC, SECUM) - Different types of video signal, composite, Y/C, component (analogue - Luminance and chrominance, S/N ratio of a video signal.

Unit V : 6

SCANNING: Interlace and progressive -Interlace scanning (monochrome and colour),blanking, chroma Sub-carrier, line waveform. - Progressive scanning: Band width and resolution.

Total : 30 Hours

Text Books:

Name of Authors	**Text Books**	**Publisher**
Philip Krejcarek	Digital Photograph – A hands on Introduction	Delmer Publishers
Adrian Davies and PhillFennessy	Digital for photographers	Focal Press
Agfa	An Introduction to Digital Scanning	Agfa, 1994

Open Elective I :YOGA AND STRESS MANAGEMENT

Objective

The objective of this study is to assess the findings of selected articles regarding the therapeutic effects of yoga and to provide a comprehensive review of the benefits of regular yoga practice. As participation rates in mind-body fitness programs such as yoga continue to increase, it is important for health care professionals to be informed about the nature of yoga and the evidence of its many therapeutic effects. Thus, this manuscript provides information regarding the therapeutic effects of yoga as it has been studied in various populations concerning a multitude of different ailments and conditions.

Course Outcome:

CO01 - Proper Breathing and Asana Practice - standing and balance postures and seated postures with proper alignment.

CO02 - Understanding of anatomy and physiology as it applies to the intentional integration of breath, postures, and movement within the practice of yoga.

CO03 - Identify asanas specific to their desired health benefits and create a yoga practice to use outside of class time.

CO04 - Apply their understanding of yogic text and principles to their daily lives and yoga practice

CO05 - Distinguish among the four forms of yoga to find the practice most suited to their personality

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	Programme Outcomes (Pos)											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02	S		M									S
CO03		M										S
CO04	S											S
CO05		S										S

Course Assessment Methods:

Direct		Indirect	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit – I **6**

Meaning and definition of Yoga – aims & objectives of yoga – misconception about yoga. Historical perceptive on yoga – yoga before the time of Patanjali (Indus valley civilization, Vedas, Brahmnas, Upanishads, Epics, Puranas). Contributions of Patanjali and Thirumular to yoga. Yoga practices and other systems of exercises.

Unit – II **6**

Schools of Yoga: Bhakthi Yoga, Jnana Yoga, Karma Yoga, Kundalini Yoga,Mantra Yoga, Hatha Yoga, Raja Yoga. Eight Limbs of Yoga: Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana & Samathi. General principles of practicing Asana, Pranayama, Meditation, Kriyas Bandhas and Mudra.

Unit – III **6**

Classification of Asanas - Meditative Asanas – Relaxative Asanas – Cultural Asanas. - safety measure and precautions while performing asanas. Pranayama – different phases in Pranayama practices: Puraka (Inhalation), Kumbhaka (Retention) and Recaka (Exhalation), - safety measures and precautions while performing pranayama. Meditation - Its techniques & benefits. Practicing methods and benefits of Kriyas, Bandha and Mudra.

Unit – IV **6**

Meaning and Definition of Stress. Types: Eutress, Distress, Anticipatory Anxiety, Intense Anxiety and Depression. Meaning of Management – Stress Management.

Unit – V **6**

Concept of Stress according to Yoga: Patanjali aphorism (PYS II - 3) Avidya Asmita. Bhagavad – Gita (Gita II 62-63) Dhayato Visayam Punsah … Yoga Vasistha and Upanishad.

Total : 30 Hours

Text Books:

1. Author's guide, (2003). Yoga – The Science of Holistic living. Chennai: Vivekananda Kendra Prakashana trust
2. Chandrasekaran, K., (1999) Sound Health through Yoga. Sedapatti: Prem Kalyan Publications.
3. Andrews, Linda Wasmer., (2005). Stress Control for peace of Mind. London: Greenwich Editions
4. Lalvani, Vimla., (1998). Yoga for stress. London: Hamlyn
5. Nagendra, H.R., and Nagarathana, R., (2004). Yoga perspective in stress management. Bangalore: Swami Vivekananda Yoga Prakashana.

Open Elective I : OFFICE MANAGEMENT

OBJECTIVE

The education in management will combine theory and practice so that students will be prepared for a business career today and in the future. Courses will often include realistic projects so that students will have the ability to apply business theory to real situations. In addition, majors in management are required to complete an experiential learning experience in the form of an internship, a service project,

OUTSOME:

CO01 - Students will be able to support management in office administration.
CO02 - Students will be able to prepare business documents.
CO03 -Students will be able to manage records.
CO04 - Students will be able to demonstrate business communication skills.
CO05 -Students will be able to utilize appropriate office technology.
CO06 – Students will be able to execute the duties of an office administrator.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (Pos)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02	S		M									
CO03		M	S	S								
CO04						S						
CO05	S			S								S
CO06	S		S									

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit –I: 6

Importance and Function of an office. Relation among department, Features of an Ideal Office, Location of Office Accommodation (accommodation of an office in an owned or rental building), Office Layout and environment.

Unit-II: 6

Office information communication management, Benefits from proper information management, information system and procedure, planning and designing of information systems, Business correspondence, process flow chart information, Office manual.

Unit –III: 6

Control on input, Storage and output, modern information storage systems: indexing, filing, forms of Organization.

Unit –IV: 6

Forms: Design, Management and Control, office suppliers and their control.

Unit –V: 6

Determining the manpower and facilities, recruitments, Office Work Measurement, Motivation, remuneration, Discipline and Grievance Redressal.

Total : 30 Hours

Recommended Books

1. Office Organization and Management - S. P. Arors, Vikas Publishing house Pvt. Ltd. Sahibabad

2. Office Management - Dr. P. C. Pardeshi, Nirali Prakashan Pune Edn. 2004

3. Office Management - Prof. V. A. Joshi and Prof. A. G. Gosavi, Narendra Prakashan, Pune

4. Office Management - P. K. Ghosh

5. A. Text Book of office Management - Willian II, Liffingwal M. Robinson, M. Edwin Robinson.

Open Elective I : BPO MANAGEMENT

OBJECTIVE:

- Helps a student to improve his language, thereby enabling him to speak English like a native speaker.
- On the other hand, introduces the learner to the basic fundamentals of Customer Relationship Management in a Call Centre environment.

OUTCOMES:

CO01 - Be able to apply theories to improve the practice of management.
CO02 - To explore the practice of management across our cultural and geographic boundaries.
CO03 - To understand the new roles emerging in organizations as a result of innovations in technology.
CO04 - the candidate will gain improved proficiency to work in a domestic or international call centre or back office.

CO/PO Mapping

S – Strong, M – Medium, W – Weak

Cos	**Programme Outcomes (POs)**											
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO01	S											
CO02			M									
CO03		M		S								
CO04				M								

Course Assessment Methods:

Direct		**Indirect**	
1	Internal Tests	1	Course and Survey
2	Assignments	2	Faculty Survey
3	Seminar	3	Industry
4	Online test	4	Alumni
5	End Semester Examinations		

Unit I : 6

Business Process Outsourcing – Basics – Benefits of BPO – Growth Drivers – BPO Models and Types of Vendors – Offshore BPO – Evolution Destinations – Challenges of Off shoring – BPO Companies in India.

Unit II : 6

BPO Industry – Employment Opportunities – Employee Structure – Skill Set Required – Compensation Levels – Contact Centre BPO – Types of Call Centres – Technology – Components and working of a Call center – Issues and Problems – Case Study – Intelenet Global.

Unit III : 6

Healthcare BPO – Structure of the American Healthcare Sector – Activity Profile – Future Trends and Threats – Case Study – Cbay Systems.

Unit IV : 6

Transaction Processing BPO - Elements of Back – Office Serivces – Financial Services – Insurance – Case Studies – Datamatics – Hinjuja TMT.

Unit V : **6**

Human Resource BPO – Reasons for outsourcing HR – Activities involved in HR BPO – HR Outsourcing Trends – Career in HR BPO – Emerging BPO Domains – Media and Entertainment BPO – Publishing BPO.

Total : 30 Hours

Text Book:

Name of the Book	Author	Publication	Year
Buisness Process Outsourcing	Sarika Kulkarni	Jaico Publishing House, Delhi	2005

Reference Book :

Name of the Book	Author	Publication	Year
BPO DIGEST	Deepak Shikapur	Ameya (Inspiring Books)	2004