

# **GOVERNMENT ARTS COLLEGE (AUTONOMOUS)**

**KUMBAKONAM 612 002**

**Re - accredited With 'A' Grade by NAAC & Affiliated to Bharathidasan University**

## **DEPARTMENT OF COMPUTER APPLICATIONS**

**(Effective for those admitted from 2017-2018 onwards)**



**SYLLABI**

**M.C.A.**

# GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KUMBAKONAM.

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## M.C.A.

(Effective for those admitted from 2017-2018 onwards)

### SEMESTER – I

#### CC 1 - DISCRETE MATHEMATICS

<b>Subject Code: 17P1CA1</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *To Obtain Knowledge from the Basic elements and Derive the Discrete Digital Process from this Subject.*

**Unit I:** Mathematical Logic: Operands, Operators, Connectives, Conditional, Bi conditional, Well formed formula, Predicate Calculus, Algebra of Propositions, Truth Table Creations. Set Theory: Definition, Finite and In finite Set, Equal Set, Equivalence Set, Empty Set, Power Set, Universal Set, Operation on Union, Intersection, and Difference Set, and Algebraic Laws of Set Theory.

**Unit II:** Relations and Functions: Types of Relations, Properties of Relations. Binary Relations, Matrix Representation of Relations. Partial Ordering Relations and Lattices: Principles of Duality. Functions: Definition, Types of Functions, Composition of Functions, Inverse of a Function, Recursive Functions, Hashing Function.

**Unit III:** Algebraic Structures: Semi groups and Monoids, Groups, subgroups and Homomorphism. Residue Arithmetic, Fermat's Theorem, Euler's Theorem, Group Codes: Communication model of Error Correction, Parity Checker, Error Recovery in Group Codes. Graphs: Basic Definition, Degree of a Vertex, Edge, Simple Graph, Matrix Representation of Graphs. Incidence Matrix, Adjacency Matrix, Huffman Adjacency Matrix. Paths, Cycles and connectivity. Graph Traversals: DFS and BFS, and Shortest Path Algorithms, Warshall's Algorithm.

**Unit IV:** Trees and Cut-Sets: Trees, Binary Tree, Rooted Trees, Path Lengths in Rooted Trees, Huffman Adjacency Code, Leaves, Weights, Missing Nodes. Prefix Codes, Binary Search Trees, Spanning Trees, Kruskal's Algorithm and Prim's Algorithm.

**Unit V:** Boolean Algebras: Lattices and Algebraic Systems, Boolean Lattices and Boolean Algebras, Boolean functions and Boolean Expressions. Simplification of Logic Expressions Using Karnaugh Map. Simplification of Logical Functions Using K-Map. Realization of product of sum Expression by K-Map. Simplification of Logic Expressions Using Quine-McCluskey Method. Design and Implementation by Gates – Digital – Switching Circuits, Constructing with the Data Flow Machines.

#### **Text book(s):**

1. "Discrete Mathematics with Graph Theory and combinatorics", T. Veerarajan, Pub: Tata McGraw Hill
2. "Elements of Discrete Mathematics", C.L. Liu and Mohapatra, Pub: Tata McGraw Hill.

#### **Reference book(s):**

1. "Discrete Mathematical Structures With Applications to Computer Science", J.P. Tremblay and R. Manohar. Pub: Tata McGraw Hill.

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**SEMESTER – I**

**CC 2 - PROGRAMMING WITH C++**

<b>Subject Code: 17P1CA2</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *C++ is the object oriented superset of ANSI C. This course provides students with a comprehensive study of the C++ Programming Language. The course stresses the object paradigm including classes, inheritance, virtual functions, and templates in the development of C++ programs.*

**Unit I:** What is Object Oriented Programming? – C++ Console I/O- C++ comments- Classes: Some difference between C and C++ - Introducing Function Overloading - Constructor and Destructor Functions- Constructors take parameters- Introducing Inheritance – Object Pointers – In line Functions – Automatic in lining.

**Unit II:** Assigning Objects – Passing Object to Functions – Returning Object from Functions- An Introduction to friend functions- Arrays of objects – Using Pointers to Objects – Using new & delete – More about new & delete – references – Passing references to objects - Returning references- Independent References and restrictions.

**Unit III:** Overloading Constructor Functions- Creating and Using a Copy constructor- Using default arguments- Overloading and ambiguity – Finding the address of an overload function- the basics of operator overloading- overloading binary operators-overloading the relational and logical operators- overloading a Unary operator – using friend operator functions- a closer at the assignment operator- overloading the subscript() operator.

**Unit IV:** Base class access control –using protected members- Constructors, destructors and inheritance - multiple inheritance- virtual bas classes- Some C++ I/O basics- formatted I/O using width(), precision () and fill() – using I/O manipulators- Creating your own inserters- creating extractors.

**Unit V:** Creating your own manipulators- File I/O basics- unformatted, binary I/O- more unformatted I/O functions- random access- checking the I/O status- customized I/O and files- Pointers and derived classes- Introduction to virtual functions- more about virtual functions- applying polymorphism- Exception handling.

**Text book(s):**

1. Herbert Schildt, “Teach Your self C++”, III edition, Tata McGraw Hill 5th Reprint 2000.

**Reference book(s):**

1. Robert Lafore, “Object Oriented Programming in Turbo C++”, Galgotia 2001
2. E. Balagurusamy “Object Oriented Programming with C++ “, TMH, New Delhi

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**SEMESTER – I**

**CC 3 - DATA STRUCTURES AND ALGORITHMS**

<b>Subject Code: 17P1CA3</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *This course aims to introduce some basic data structures and algorithms which are to be used as tools in designing solutions to problems. You will become familiar with the specification, usage, implementation and analysis of these data structures and algorithms. By the end of this course you should be able to Design algorithms to solve real-life problems using the tools introduced, Analyze your solution, Efficiently implement your solution.*

**Unit I:** Introduction to data structures, Records, Arrays, Stacks, Queues, Recursion, Linked list, Binary tree and traversing.

**Unit II:** Sorting and Searching Techniques: Introduction, Internal and External Sorting, Insertion, Selection, Merging, Radix, Quick sort, Heap sort and Bubble sort. Searching: Introduction, Sequential search, Binary search, Binary Tree search.

**Unit III:** Graphs and Their applications: Introduction, Graph Theory, Terminology, Representation of graphs, Tree & Binary tree, operations on graphs, shortest path Algorithms, Topological sorting.

**Unit IV:** Algorithms, Development of Algorithms, basic concepts, Structured Program Concepts, Top down development of algorithms, Principle of analyzing Algorithms, Algorithms design methods, Sub goals, Hill climbing

**Unit V:** Algorithms Design Techniques: Divide and Conquer algorithms, Dynamic Programming, Greedy algorithms, Backtracking and Branch & bound.

**Text book(s):**

- 1.Seymour Lipschitz “Data Structures, Tata McGraw-Hill
2. Ellis Horowitz & S. Sahni, Fundamentals of Data Structures, Galgotia Pub.

**Reference book(s):**

1. Data Structures Using C – Langsam, Augenstien, Tenenbaum, PHI
2. Data structures and Algorithms, V.Aho, Hopcroft, Ullman , LPE
3. Introduction to design and Analysis of Algorithms – S.E. Goodman,ST. Hedetniem- TMH.

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**SEMESTER – I**

**CC 4 - DIGITAL ELECTRONICS AND MICROPROCESSORS**

<b>Subject Code: 17P1CA4</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *To disseminate knowledge of digital principles, combinational and sequential logic fundamentals, to introduce microprocessor, its principles and its applications to postgraduate students of computer science and applications*

**Unit I:** Number Systems and Codes: Binary, Octal and Hexadecimal number systems-conversion between number systems-complements- binary arithmetic-binary codes Boolean Algebra and Logic Gates: AND, OR, NOT, NAND, NOR, XOR, XNOR gates – Truth tables- Applications of XOR gates- Fundamentals of Boolean Algebra- Boolean functions- Minterms and Maxterms- Laws and theorems of Boolean algebra- Demorgan's theorems- the Universal building blocks – NAND and NOR gates

**Unit II:** Simplification of Boolean Expressions: Canonical SOP and POS forms- Algebraic simplification- Karnaugh Maps- SOP and POS Simplification- NAND / NOR implementation of Boolean expressions- Don't care conditions- Overlapping, Rolling groups, eliminating redundant groups  
Combinational Logic Circuits: Half and Full Adders- Half and Full Subtractors- Parallel binary adder- Multiplexer & De-Multiplexer- Encoder & Decoder

**Unit III:** Sequential Logic Circuits: NAND, NOR latches- SR Flipflop-JK Flipflop- Edge triggering- PRESET and CLEAR inputs- Shift Register, Universal Shift Register-Asynchronous and Synchronous counters- BCD counter

**Unit IV:** Microprocessor architecture: Introduction- Intel 8085: ALU-Timing and Control unit-Registers-Data and Address Bus-Pin configuration-Intel 8085 instructions-Instruction cycle- Timing diagram- RISC and CISC processors  
Instruction Set for Intel 8085: Instruction and Data formats- Addressing modes- Status Flags- Intel 8085 instruction groups

**Unit V:** Assembly Language Programming: Addition- Subtraction- Decimal addition / subtraction- Complement Arithmetic- Shifting- Masking- concept of Arrays and operation on array values- Sum of Series- Multiplication- Division- Multibyte addition / subtraction  
Peripheral devices and Interfacing: Introduction- Address space partitioning- and I/O interfacing- Data transfer schemes- Interrupts of Intel 8085- Interfacing devices and I/O devices- I/O ports- Programmable Peripheral Interface (PPI) - Architecture of Intel 8255

**Text book(s):**

- 1.Thomas Bartee C, Digital Computer Fundamentals. TMH, 3<sup>rd</sup> Edition
- 2.Malvino and Leech, Digital principles and Applications, TMH, 2<sup>nd</sup> Edition
3. Badri Ram, Fundamentals of Microprocessors and Microcomputers, Dhanpat Rai Publications (P) Ltd, 4<sup>th</sup> Edition

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**SEMESTER – I**

**EC 1 - PRINCIPLES OF MARKETING**

<b>Subject Code: 17P1CA5EC</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *This course provides an introduction to basic marketing concepts. Topics include the marketing mix, new product development, consumer behavior, customer relationship management, strategic planning and e-commerce. Students will develop a comprehensive marketing plan and apply course concepts to real or imaginary products.*

**Unit I:** Market – Meaning - Types. Marketing – Definitions – Nature – Evolution - Functions and their Classification. Selling Vs Marketing.

**Unit II:** Brand: Meaning – Types and Features – Advantages and Disadvantages of Branding. Labelling: Functions – Advantages and Disadvantages.  
Packaging: Functions – Kinds of Material used – Requisites of a good package.

**Unit III:** Product: Meaning – Features – Classification – New Product Development – Life Cycle – Product Mix – Expansion – Contraction. Price – Meaning – Objectives – Methods of Pricing.

**Unit IV:** Personal selling: Meaning – Objectives – Features. Salesmanship – Meaning and Qualities. Advertisement – Meaning –Types - Advantages and Objections

**Unit V:** Sales Promotion: Definition – Objectives – Advantages and Limitations – Kinds of sales promotion – Consumer – Dealer – Sales force.

**Books recommended:**

1. PRINCIPLES OF MARKETING : R.S.N. PILLAI & BHAGAVATHI.
2. ELEMENTS OF MARKETING : RAJAN NAIR.
3. MARKETING MANAGEMENT : S.A. SHERLEKAR.

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**SEMESTER – I**

**CC 1 - DATA STRUCTURES LAB USING C++**

<b>Subject Code: 17P1CAP1</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *Have a good overall understanding of basic data structures, their design and analysis. Know how to implement many of them in C++, and use them in other applications.*

**Write C++ programmes to implement the following:**

1. SORTING:
  - a. Bubble Sort
  - b. Insertion Sort
  - c. Selection Sort
  - d. Heap Sort
  - c. Quick Sort
2. SEARCHING:
  - a. Linear Search
  - b. Binary Search
3. Matrix Manipulations
4. Polynomial Addition & Multiplication
5. Operations on Stack and Conversion of expressions
6. Operations on Queue
7. Operations on Linked List
8. Operations on Doubly Linked List
9. Operations on Binary tree and Traversals
10. Dijkstra's Algorithms to find the Shortest Path
11. File Processing

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**SEMESTER – I**

**CC 2 - DIGITAL ELECTRONICS AND MICROPROCESSORS LAB**

<b>Subject Code: 17P1CAP2</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *To make students know the fundamental principles behind digital electronics including basic gates, combinational and sequential logic and to introduce microprocessor, its principles and its applications on practical scope:-*

**DIGITAL ELECTRONICS LAB**

1. Basic gates using IC-AND, OR, NOT, NAND, NOR, XOR, XNOR gates
2. Universal building blocks – NAND and NOR gates
3. Simplification of Boolean Expressions: Canonical SOP / POS form (Karnaugh Map) and designing Combinational logic circuit
4. Combinational Logic Circuits: Half and Full Adders- Half and Full Subtractors
5. Multiplexer & De-Multiplexer
6. Encoder & Decoder
7. Sequential Logic Circuits: NAND, NOR latches
8. D-Flip Flop, JK Flipflop
9. Shift Register
10. Asynchronous counter
11. BCD counter

**MICROPROCESSORS LAB-Assembly language programming**

12. Simple Addition / Subtraction
13. Decimal addition / subtraction
14. Complement Arithmetic
15. Shifting values / Masking values
16. Arrays and operation – Addition
17. Find Largest from Array data values
18. Sum of Series
19. Multiplication- Division
20. Multibyte addition / subtraction
21. Peripheral devices and Interfacing through I/O ports- Programmable Peripheral Interface (PPI)- Intel 8255 Operations

**Text book(s):**

1. Thomas Bartee C, Digital Computer Fundamentals. TMH, 3<sup>rd</sup> Edition
2. Malvino and Leech, Digital principles and Applications, TMH, 2<sup>nd</sup> Edition
3. Badri Ram, Fundamentals of Microprocessors and Microcomputers, Dhanpat Rai Publications (P) Ltd, 4<sup>th</sup> Edition



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**SEMESTER – II**

**CC 5 - JAVA PROGRAMMING**

<b>Subject Code: 17P2CA6</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *To impart sound knowledge in Object Oriented Programming skills in JAVA.*

**Unit I:** Fundamentals of Object Oriented Programming: Basic Concepts–Variables–Operators Classes, Objects and Methods: Defining a Class – Adding Class Members – Accessing Class Members – Constructors – Methods Overloading – Static Members – Nesting of Methods –Inheritance – Overriding Methods – Final Variable and Methods – Final Variable and Methods –Final Classes – Abstract Methods and Classes.

**Unit II:** Interfaces, Multiple Inheritance – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables – Packages – Java API Packages – Using System Packages – Creating and Accessing Packages – Adding class to a Packages – Arrays.

**Unit III:** Creating Threads – Extending the thread class – Stopping a thread – blocking a thread – Life cycle of a thread– Managing Errors and Exceptions – Types of Errors – Exceptions – Syntax of Exception handling code – Multiple Catch Statements.

**Unit IV:** Files and IO Streams: File – The Byte Streams: InputStream – Output Stream – FileInputStream – FileOutputStream – PipedInputStream – PrintStream – The Character Streams– FileReader and FileWriter – Serialization – Networking– Networking classes and interfaces: InetAddress class – TCP/IP Client and Server sockets – Datagrams – URL and URLConnection classes.

**Unit V:** Introduction to Applet class – Applet Architecture – The HTML APPLET tag – Passing parameters to Applets – Event handling: The Delegation Event Model, Event Classes, Event Listener Interfaces – Working with Graphics, Color and Font classes – Understanding Layout managers – Swing Component classes: JApplet, JFrame and JDialog – Text Fields, Buttons, Combo boxes, List ,Tabbled and Scroll Panes. Understanding Layout managers.

**Text book(s):**

1. E.Balagurusamy, Programming with JAVA, Tata McGraw–Hill Publishing Company Limited, New Delhi.
2. Herbert Schildt, The Complete Reference Java 2, Fifth Edition, TMH Education Pvt. Ltd.,2009.

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**SEMESTER – II**

**CC 6 - DATABASE ADMINISTRATION AND MANAGEMENT**

<b>Subject Code: 17P2CA7</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Unit I:** Introduction – purpose of database systems – Data Abstraction – Data models – Instances and schemes – Data independence – DDL – DML – Database users – ER model – Entity sets – Keys – ER diagram – relational model – Structure – Relations Algebra – Relational Calculus – Views.

**Unit II:** SQL – QBE – QUEL – Basic structure – various Operations – Relational database design problems in the relational data base design – Normalisation – normalization using functional, Multi value and join dependencies.

**Unit III:** File and system structure – overall system structure – file Organization – data dictionary – Indexing and hashing – basic concept B and B+ tree indices – Static and Dynamic hash functions.

**Unit IV:** Recovery and atomicity – failures classification and types – Transaction model and Log based recovery, schedules – serial and non-serial types – Serialization of schedules and views – testing for seriability – lock based protocols – time based protocols – validation techniques – multiple Granularity – multiversion schemes – insert and delete Operations.

**Unit V:** Distributed data bases – structure of distributed databases – Trade offs in Distributing the database – Transparency and autonomy – distributed query processing – recovery in distributed systems – commit protocols – security and integrity violations – authorization and views – security specification – encryption – Statistical databases.

**Text Book(s):**

1. Henry F.Korth, and Abraham Silberschatz,, Sudarshan “Database system Concepts”, McGraw Hill, 4<sup>th</sup> Edition, 2002

**References:**

1. Pipin C.Desai, “An Introduction to data base systems”, Galgotia Publications Private Limited, 1991.
2. C.J.Date, “An Introduction to Database Systems”, 3<sup>rd</sup> Edition, Addison Wesley 1983.

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**SEMESTER – II**

**CC 7 - OPERATING SYSTEM**

<b>Subject Code: 17P2CA8</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** Study the process management of Operating system. Gain knowledge in the management and I/O systems of Operating system. COURSE OUTCOMES Upon Completion of the course, the students should be able to: Ability to discuss on the basics of OS. In depth knowledge in process management, memory management and I/O Management. Of various operating systems. To explore the case studies with various operating systems.

**Unit I:** Operating Systems Objectives and functions – Operating System and User /Computer Interface - Operating System as a Resource Manager: Evolution of Operating Systems – Serial Processing - Simple Batch Systems- Multi programmed Batch system - Time Sharing Systems.

**Unit II:** Process Description and Control: Process State – Process Description – Process Control. Processes and Threads. Concurrency: Principles of Concurrency- Mutual Exclusion – Software support, Dekker’s Algorithm – Mutual Exclusion – Hardware support- Semaphore. Concurrency Deadlock: Principles of Dead Load - prevention- Deadlock Detection- Deadlock Avoidance.

**Unit III:** Memory Management: Memory Management Requirements - Memory Partitioning - Paging – Segmentation. Virtual Memory – Operating System Software. Scheduling – Types of Scheduling – Scheduling Algorithms - scheduling criteria – FIFO - Round Robin.

**Unit IV:** I/O Management: I/O Devices – Organization of I/O function – Operating system Design Issues – I/O Buffering – Organization of the I/O function. File Management: Overview – File Organization and Access – File Directories – File Sharing.

**Unit V:** Distributed system: Distributed Processing, Client/ Server: Client server Computing –Remote Procedure calls – Cluster. Computer Security: Security Threads – Protection – Intruders – Malicious Software.

**Text book(s):**

1. William Stallings, “Operating Systems”, Second edition, Maxwell McMillan, International Editions, 1997.

**Reference(s):**

1. Dental H.M. “An Introduction to Operating Systems”, Addison Wesley Publishing Co., 1998.
2. Silberchatz A., Peterson J.L., Galvan P. “Operating System Concepts”, Third Edition, Addison Wesley Publishing Co., 1992.
3. Charles Crowley, “Operating Systems-A Design Oriented Approach”, IRWIN Publications Chicago, 1997.

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**SEMESTER – II**

**CC 8 - GRAPHICS AND MULTIMEDIA**

<b>Subject Code: 17P2CA9</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *To impart knowledge on the graphics primitives, advanced concepts of computer graphics and to disseminate ideas of multimedia applications to post graduate students.*

**Unit I:** Overview of graphics systems: Video display devices – Raster scan systems – input devices – hard cope devices. Output primitives: Points and lines – line drawing algorithms – DDA algorithm – Bresenham’s line algorithm – circle generation algorithm – Filled – boundary fill algorithm – flood fill algorithm.

**Unit II:** Attributes of output primitives: Line attributes – curve attributes – color and levels – area fill attributes – character attributes – bundled attributes – inquiry functions. Two dimensional geometric transformations: Basic transformation – matrix representation – composite transformation – other transformation.

**Unit III:** Two dimensional viewing: Window to viewport coordinate transformation – two dimensional viewing functions – clipping operations – point clipping – line clipping – text clipping. Graphical user interfaces and interactive input methods: Input of graphical data – input functions – interactive picture construction techniques.

**Unit IV:** Three dimensional concepts: Three dimensional display methods: Parallel projection – perspective projection. Three dimensional object representations: Polygon surface – curved lines and surfaces. Three dimensional geometric and modeling transformations: Translation – rotation – scaling – other transformation. Three diemensional viewing: Projections.

**Unit V:** Computer Animation: Design of animation sequence – general computer animation functions – raster animation – computer animation languages – key frame systems – morphine – simulating accelerations – motion specification – direct motion specification – goal directed systems – kinematics and dynamics.

**Text book(s):**

Computer graphics – Donald Hearn & M. Pauline Baker – Prentice – Hall of india private limited.

**Reference book(s):**

Newman William M, & Sproull Robert F, Principles of interactive computer graphics, Second edition, Tata –McGraw Hill, 1 (ISBN 0-07-463293-0)

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**SEMESTER – II**

**EC 2 - MANAGERIAL ECONOMICS**

<b>Subject Code: 17P2CA10EC</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:**

- 1) *To provide students with a basic understanding of the Economic Theory and tools that can be used in decision making problems.*
- 2) *To cater good understanding of Economic concepts that have Managerial Applications,*
- 3) *To strengthen the Analytical skills of students.*

**Unit I: Nature and Scope of Managerial Economics:** - Meaning, Nature and Scope - Managerial Economics and Business Decision Making – Role and Responsibilities of Managerial Economist - Fundamental Concepts of Managerial Economics

**Unit II: Demand Analysis:** - Meaning, Determinants and Types of Demand - Elasticity of Demand- Demand Forecasting – Quantitative Methods: Barometric and Time Series Methods- Qualitative Methods-Delphi-Survey-Test Marketing and Market Experiment- and Importance of Demand Forecasting.

**Unit III: Cost concepts:** – Short and Long Run Cost - Output relationship - Economies and Diseconomies of scale - Cost Control and Cost reduction.

**Unit IV: Pricing Analysis:** Methods of Pricing – Pricing Methods for Established and New products -Government control over pricing-Price Discrimination and its types.

**Unit V: Profit Analysis:** - Meaning and Nature - Profit Policies - Profit Planning and Forecasting – Break-Even Point Analysis and its managerial uses-Capital Budgeting-Cost of Capital-Different Methods of Appraising Project Profitability.

**Reference(s):**

- Athmanand.R., Managerial Economics, Excel, New Delhi, 2002.  
P.L.Mehta, Managerial Economics, New Delhi, Latest Edition.  
Varsheny and Maheshwari, Managerial Economics, Latest Edition.  
Peterson Lewis, Managerial Economics, Prentice Hall of India, New Delhi, Latest Edition.  
Mark Hirschey, Managerial Economics, 10th edition, Latest Edition.

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**SEMESTER – II**

**CC 3 - JAVA PROGRAMMING LAB**

<b>Subject Code: 17P2CAP3</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *To impart Practical Training in Java Programming Language.*

1. Assume that a bank maintains 2 kinds of account for its customers' one called savings account and the other current account' The savings account provides compound interest and withdraw facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account falls below this level a service charge is imposed. Create a class Account that stores customers name' account number and type of account. From this derive the classes curr-acct and sav-acct to make them more specific to their requirements. Introduce the necessary methods in order to achieve the following tasks:
  - a. Accept deposit form a customer and update the balance.
  - b. Display any deposit interest
  - c. Compute and deposit interest.
  - d. Permit withdrawal and update the balance.
  - e. Check for the minimum balance' impose penalty' if necessary and update the balance.Use constructors and methods to initialize the class members.
2. Write a program that accepts a shopping list of five items from the command line and stores them in a vector and accomplish the following:
  - a. To delete an item in the list.
  - b. To add an item at a specified location in the list.
  - c. To add an item at the end of the list.
  - d. To print the contents of the vector.
3. Implementation of the concept of multiple inheritance using interfaces and design a package to contain the class students and another package to contain the interfaces sports.
4. Develop a simple real-life application program to illustrate the use of multithreads.
5. Create a try block that is likely to generate three types of exception and then incorporate necessary catch blocks to catch and handle them appropriately.
6. Write a Java applet' which will create the layout below:

FORMAT

Enter your Name:

Enter your Age:

Select City: \*Delhi \*Madras

Select SIW: \*Oracle \*Visual Basic \*Java

OK CANCEL

Handle the following simple validations.

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**SEMESTER – II**

**CC 4 - RDBMS (ORACLE) LAB**

<b>Subject Code: 17P2CAP4</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *The major objective of this lab is to provide a strong formal foundation in database concepts and its implementations, techniques relating to query processing by SQL Engine*

1. Creating & updating and inserting into database & simple queries.
2. Uses of Select statement - for queries.
  - a. AND' OR' NOT Operators' WHERE clause.
  - b. UNION' INTERSECTION' MINUS.
  - c. Sorting and grouping.
3. Nested queries using SQL. a. Sub queries. b. Join.
4. Built-in-functions of SQL.
5. Use of indexes' creating views and querying in views.
6. Cursors' triggers and stored procedures and functions.
7. Case Studies:
  - a. Student evaluation systems.
  - b. Pay - roll system
  - c. Income tax calculations.
  - d. Seat reservation Problems
  - e. Mark - sheet Preparation.

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**SEMESTER – III**

**CC 9 - DATA COMMUNICATION NETWORKS**

<b>Subject Code: 17P3CA11</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *This course aims to provide all the program, date and hardware is available to the students on the network without regard to the physical location of the resource and the users.*

**Unit I:** Introduction – Data Communications – Networks – Protocols and Standards. Network models– Layered Tasks – The OSI model – Layers in the OSI model – TCP/IP Protocol suite – Addressing.

**Unit II** The physical layer and media – Data and Signals: Analog and Digital – Periodic Analog signals Digital signals – Transmission Impairment – Data rate limits. Transmission media: Guided media – Unguided media. Switching: Circuit switched Networks – Datagram Networks – Virtual Circuit Networks – Structure of a switch.

**Unit III:** Data link layer – Error detection and Correction: - Introduction – Block coding Linear block codes – Cyclic codes – Checksum. Data Link Control: - Framing – Flow and Error control – HDLC – Point-to-Point protocols.

**Unit IV:** Network layer IPV4 Addresses – IPV6 Addresses –Network layer Internet Protocol: Internetworking - IPv4-IPv6. Network Layer: Delivery, Forwarding, and Routing: Delivery, Forwarding.

**Unit V:** Transport layer and Application layer Process-to-process Delivery – User Protocol (UDP) – TCP – SCTP Congestion control and Quality of Service:- Data Traffic – Congestion – Congestion Control – Examples – Quality of Service. Application Layer: Domain Name System (DNS) –Name Space – Domain Name System - DISTRIBUTION OF NAME SPACE.

**Text book(s):**

1. Behrouz A.Forouzan, 2008, Data Communication and Networking, Fourth Edition, Tata McGraw Hill, New Delhi.

**Reference book(s):**

1. Tanenbaum, A.S., 2001, Computer Networks, PHI, New Delhi, 3rd Edition.
2. Halsall, Fred, 2001, Data communication Computer Network and Open System, 4th Edition, Pearson education.
3. Black, Uyles.D, 1997, Computer Networks: Practical Standards and Interfacing, 2nd Edition,PHI, New Delhi.
4. Comer Douglas. E, 1999, Computer Networking and Internets, 2nd Edition,PHI, New Delhi.



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### SEMESTER – III

#### CC 10 - OPEN SOURCE TECHNOLOGIES

<b>Subject Code: 17P3CA12</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *This course aims to introduce the principles of open source technology, benefits of open source, and the product that includes permission to use its source code, design documents, or contents. The students will also study and understand the different open source licenses and how to start an open source project.*

**Unit I:** OPEN SOURCE – Introduction : Open Source – Open Source vs. Commercial Software – What is Linux? – Free Software – Where I can use Linux? Linux Kernel – Linux Distributions.

**Unit II:** LINUX – Introduction: Linux Essential Commands – Filesystem Concept – Files – The Linux Security Model – Vi Editor – Partitions creation – Shell Introduction – String Processing – Investigating and Managing Processes – Network Clients – Installing Application

**Unit III:** APACHE – Introduction – Apache Explained – Starting, Stopping, and Restarting Apache – Modifying the Default Configuration – Securing Apache – Set User and Group – Consider Allowing Access to Local Documentation – Don't Allow public\_html Web sites – Apache control with .htaccess

**Unit IV:** MySQL – Introduction – Apache Explained – Starting, Stopping, and Restarting Apache – Modifying Introduction to MY SQL – The Show Databases and Table – The USE command – Create Database and Tables – Describe Table – Select, Insert, Update, and Delete statement – Some Administrative detail – Table Joins – Loading and Dumping a Database.

**Unit V:** PHP – Introduction – Apache Explained – Starting, Stopping, and Restarting Apache – Modifying Introduction– General Syntactic Characteristics – PHP Scripting – Commenting your code – Primitives, Operations and Expressions – PHP Variables – Operations and Expressions Control Statement – Array – Functions – Basic Form Processing – File and Folder Access – Cookies – Sessions – Database Access with PHP – MySQL – MySQL Functions – Inserting Records – Selecting Records – Deleting Records – Update Records.

**Text book(s):**

1. "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", James Lee and Brent Ware, Dorling Kindersley(India) Pvt. Ltd, 2008

**Reference book(s):**

1. "Setting Up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Eric Rosebrock, Eric Filson, Published by John Wiley and Sons,2004.

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**SEMESTER – III**

**CC 11 - .NET FRAME WORK AND C#**

<b>Subject Code: 17P3CA13</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *This course aims to create and populate Windows Forms, create user controls in a Windows Forms application, create menus in a Windows Forms application, add code to form and control event procedures in a Windows Forms application and Validate user input in a Windows Forms application*

**Unit I:** Introduction to C# : C# Features – Understanding .Net – C# Basics : Simple C# Console Application – Namespaces and Comments – Getting and Displaying Interactive Input – Multiple Classes and Main Methods –Tokens – Data Types –Variables.

**Unit II:** Boxing and Unboxing – Expression – Type Conversion – Mathematical Decision Making: Branching – Looping Methods , Arrays and Strings : Methods – arrays – String – Structure – Enumeration.

**Unit III:** C# OOP Concepts : Introduction – Classes – Constructors – Destructor – Properties – Indexer – Inheritance – Polymorphism – Interface – Delegates – Events – Errors – Exception.

**Unit IV:** Application Development on .Net : Building windows Application & Events – Accessing data with ADO.Net , Web Based Application Development on .Net : Web forms – Creating web Application projects – Server Controls – Web Services.

**Unit IV:** The CLR and the .Net Framework : Assemeby – Versioning – Attributes – Reflection – Marshalling – Remoting – Threads.

**Text book(s):**

- 1.C# and .Net Framework , R.Manjula Devi , Dr.R.C. Suganthe Charulatha Publication

**Reference book(s):**

1. Jesse Liberty, “Programming C#”, Second Edition, O’Reilly Press, 2002.
2. Robinson et al, “Professional C#”, Fifth Edition, Wrox Press, 2002.

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**SEMESTER – III**

**CC 12 - BIG DATA ANALYTICS**

<b>Subject Code: 17P3CA14</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *At the end of the Course, students will possess the skills necessary for utilizing tools including deploying them on Hadoop/MapReduce to handle a variety of big data analytics, and to be able to apply the analytics techniques on a variety of applications.*

**Unit I:** Providing Structure to Unstructured Data: Background–Machine Translation–Auto coding–Indexing–Term Extraction – Identification , Deidentification , and Reidentification : Features of an Identifier System–Registered Unique Object Identifiers–Really Bad Identifier Methods–Embedding Information in an Identifier: Not Recommended–One–Way Hashes–Use Case: Hospital Registration–Deidentification–Data Scrubbing–Reidentification–Lessons Learned – Ontologies and Semantics.

**Unit II:** Introspection – Data Integration and Software Interoperability: Background–The Committee to Survey Standards–Standard Trajectory–Specifications and Standards–Versioning–Compliance Issues–Interfaces to Big Data Resources – Immutability and Immortality.

**Unit III:** Measurement: Background–Counting–Gene Counting–Dealing with Negations–Understanding Your Control–Practical Significance of Measurements–Obsessive–Compulsive Disorder: The Mark of a Great Data Manager – Simple but Powerful Big Data Techniques: Background–Look At the Data–Data Range–Denominator–Frequency Distributions–Mean and Standard Deviation–Estimation–Only Analyses–Use Case: Watching Data Trends with Google Ngrams–Use Case: Estimating Movie Preferences – Analysis

**Unit IV:** Special Consideration in Big Data Analysis: Background–Theory in Search of Data–Data in Search of a Theory–Overfitting–Bigness Bias–Too Much Data–Fixing Data–Data Subsets in Big Data: Neither Additive nor Transitive–Additional Big Data Pitfalls – Stepwise Approach to Big Data Analysis – Failure.

**Unit V:** Legalities: Background–Responsibility for the Accuracy and Legitimacy of Contained Data–Rights to Create, Use, and Share the Resource–Copyright and Patent Infringements Incurred by Using Standards–Protections for Individuals–Consent– Unconsented Data–Good Policies Are a Good Policy–Use Case: The Havasupai Story – Societal Issues: Background–How Big Data Is Perceived–The Necessity of Data Sharing, Even When It Seems Irrelevant–Reducing Costs and Increasing Productivity with Big Data–Public Mistrust–Saving Us from Ourselves–Hubris and Hyperbole

**Text book(s):**

1. Principles of Big Data – Jules J Berman – Morgan Kaufmann–2013
2. Big Data Analytics for beginners – Faraz Rabbani, Ali Roghani – Create space Independent Publishing Platform – 2014

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**SEMESTER – III**

**EC 3 - PROBABILITY AND STATISTICS**

<b>Subject Code: 17P3CA15EC</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:**

- *To know the basic concepts of probability and random variable.*
- *To understand the problem in correlation, regression and Test of significance for small samples and network analysis.*

**Unit I:** Probability- Definition, Events, Mutually exclusive, equally and Independent events .Statistical and Mathematical Probability, Axiomatic approach to Probability. Addition, Multiplication and Baye's theorem. (Simple problems).

**Unit II:** Random Variables – Definition. Discrete distributions –Binomial, Poisson and Negative Binomial distributions-Definitions, mean, variance and mgf. (Derivation only)

**Unit III:** Correlation – Definition, Types. Karl – Pearson's co – efficient of correlation-simple problems. Regression –Definition, properties of Regression co-efficient, Regression equation (two variable) - Simple problems. Difference between Correlation and Regression.

**Unit IV:** Small samples – Definition - Test of Significance for Small Samples –'t' test for Single mean, Difference between two means, F test for equality of variances, Chi – Square test for goodness of fit. (Simple problems).

**Unit V:** Network analysis –Critical path method – earliest start and finishing time – latest start and finishing time – total float – independent float – PERT. Difference between CPM and PERT (Simple problems).

**Books for reference:**

1. Fundamentals of Mathematical Statistics - Gupta S.C and Kapoor V.K Sultan & Sons, New Delhi.
2. Statistical methods- S.P.Gupta, Sultan & Sons, New Delhi.
3. Probability, Statistics and random Process - T. Veerarajan.
4. Operations Research - V. K. Kapoor.
5. Operations Research – DoculesMantcomery. (Wiley publications)

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**SEMESTER – III**

**CC 5 - C# .NET LAB**

<b>Subject Code: 17P3CAP5</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *This advanced Microsoft visual studio .net c sharp lab course teaches a deep exploration of .NET development philosophy and practical advice.*

1. Write a Program in C# to check whether a number is Palindrome or not.
2. Developing the Account creation for Bank using interface.
3. Write a Program in C# to find the roots of Quadratic Equation.
4. Write a Program in C# to demonstrate Boxing and unBoxing.
5. Write a Program in C# to implement Stack operations.
6. Write a Program to demonstrate Operator overloading.
7. Write a Program in C# to multiply to matrices using Rectangular arrays.
8. Develop a C# application to perform timer based quiz of 10 questions.
9. Develop a VB.Net application using the File, Direcory and Directory controls to implement a common dialog box.
10. Student mark list Using OLEDB
11. Develop a database application using ADO.NET to insert, modify, update and delete operations.
12. Develop a C#.Net application using Datagrid to display records.
13. Develop Payroll application using Datagridview to add, edit and modify records.

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**SEMESTER – III**

**CC 6 - PHP AND MySQL LAB**

<b>Subject Code: 17P3CAP6</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *To provide fundamental concept of internet, javascript, xml, Jsap, Asp with a view to developing professional software development skills.*

1. Write a server side php program that display marks, total, grade of student in tabular format by accepting user inputs for name, number and marks from a HTML form.
2. Write a php program that adds products that a selected from a web page to a shopping cart.
3. Write a php program to access the data stored in my sql table.
4. Write a php program interface to create a database and insert a table
  - a) Write a php program using classes to create a table
5. Write a php program to create a directory and read contents from the directory.
6. Write a shell program to find the details of an user session.
7. Write ashell program to change the extension fo a give file.
8. Create a mysql table and execute queries to read, add, remove and modify a record from the table.
9. Create a php program for USER AUTHENTICATION.
10. Create a php program for UPLOAD FILE TO SERVER.

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**SEMESTER – IV**

**CC 13 - PRINCIPLES OF COMPILER DESIGN**

<b>Subject Code: 17P4CA16</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *An introduction to the design and implementation of programming language translators. Theoretical aspects of language design and translation are discussed and practically demonstrated by developing a working compiler.*

**Unit I:** Introduction on the phase of the compiler – Lexical Analysis, Regular Expression- Non deterministic Automata, Deterministic Automata equivalent to NFA's. Minimizing the states of DFA, Implementation of Lexical Analyzer.

**Unit II:** Syntax Analysis – Context free grammars - Top down Parsing Concepts, Recursive Descent Parsing, Predictive Parsers, Non recursive Predictive Parsing – Bottom Up Parsing, Handle pruning, Shift reduce parsing – Operator Precedence Parsing – Error recovery in Parsing, Parser Generators – YACC. [Omit LR Parsers : Sec 4.7]

**Unit III:** Intermediate Code Generation: Syntax directed Definitions, Construction of Syntax trees – Top down Translation, Bottom up Evaluation of inherited Attributes, Recursive Evaluators, Assigning Space at Compiler Construction time – Type checking.

**Unit IV:** Storage Organization : Storage Organization, Storage Allocation Strategies, Parameter Passing, Symbol tables, Dynamic Storage Allocation, Intermediate Languages – Representation of Declarations, Assignment Statement, Boolean Expression, Back patching, Procedure calls.

**Unit V:** Code Generation and Optimization: Design of the code generators, Runtime storage Management, Basic blocks and flow graphs, Register Allocation and Assignment, DAG representation of Basic blocks, Peephole optimization, Code optimization – The principle sources of optimization, Optimization of basic blocks, Global data flow Analysis, Loop optimizations.

**Text book(s):**

1. Alfred V.Aho, Ravi Sethi, Jeffrey D.Ullman, "Compilers – Principles, Techniques and Tools", 2007, Pearson Education.
2. Dhamdhare D.M., "Compiler Construction Principles and Practice", 1981, Macmillan India.

**Reference books(s):**

1. Reinhard Wilhm, Director Mauser, "Compiler Design", 1995, Addison Wesley.

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**SEMESTER – IV**

**CC 14 - DISTRIBUTED TECHNOLOGIES WITH ASP.NET**

<b>Subject Code: 17P4CA17</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *The goal of this course is to introduce the students to the basics of distributed application development and introduce the students to Web Service development and .NET remoting. Technologies covered include the Common Language Runtime (CLR), .NET framework classes, ASP.NET, and ADO.NET.*

**Unit I:** Introduction to Distributed Computing – Challenges involved in establishing remote connection - Strategies involved in remote computation – Current Distributed computing practices through Dot Net and Java technologies.

**Unit II:** Advanced ADO.NET – Disconnected Data Access – Grid View, Details View, Form View Controls – Crystal Reports – Role of ADO.NET in Distributed Applications.

**Unit III:** Advanced ASP.NET – AdRotator, Multiview, Wizard and Image Map Controls – Master Pages – Site Navigation – Web Parts – Uses of these controls and features in Website development.

**Unit IV:** Advanced Features of ASP.NET – Security in ASP.NET – State Management in ASP.NET – Mobile Application development in ASP.NET – Critical usage of these features in Website development.

**Unit V:** Web Services – Role of Web Services in Distributed Computing – WSDL, UDDI, SOAP Concepts involved in Web Services – Connecting a Web Service to a Data Base – Accessing a Web Service through an ASP.Net Application.

**Text book(s):**

1. ASP .NET 3.5, Waither, SAMS Publication, 2005



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**SEMESTER – IV**

**CC 15 - J2ME AND ANDROID**

<b>Subject Code: 17P4CA18</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *To understand the basic concepts of J2ME AND Android.*

**Unit I:** J2ME Architecture and Development Environment – J2ME Architecture – Small Computing Device Requirements – Run– Time Environment – Inside the Java Archive – File – Inside the Java Application Descriptor File – MIDlet Programming – Event Handling – User Interfaces – Hello World J2ME Style – Multiple MIDlets in a MIDlet Suite – J2ME Wireless Toolkit – Building and Running a Project – . Hello World Project – MIDlets on the Internet . Commands, Items, and Event Processing – J2ME User Interfaces – Display Class – The Palm OS Emulator Command Class – CommandListener – Item Class – Item Listener – Exception Handling – Throwing a MIDletStateChangeException.

**Unit II:** High– Level Display: Screens – Screen ClassAlert Class – Alert Sound – Form Class – Item Class – ChoiceGroup Class – DateField Class – Gauge Class – StringItem Class – TextField Class – ImageItem Class – List Class – Creating an Instance of a List Class – TextBox Class – Creating an Instance of a TextBox Class – Ticker Class.

**Unit III:** Record Management System – Record Storage – The Record Store – Record Store Scope – Setting Up a Record Store – Writing and Reading Records – Creating a New Record and Reading an Existing Record – Writing and Reading Mixed Data Types – Record Enumeration – Reading a Record of a Simple Data Type into a RecordEnumeration – Reading a Mixed Data Type Record into a RecordEnumeration – Sorting Records – Sorting Single Data Type Records in a RecordEnumeration – Sorting Mixed Data Type Records in a RecordEnumeration – Searching Records – Searching Single Data Type Records – Searching Mixed Data Type Records – RecordListener

**Unit IV:** Introduction to Android– Android Tools – APIS – Application Life Cycle – Android Application Life Cycle – Creating Your First Android Project in Eclipse – Directories – res Directory – assets Directory – <activity>.java File – Hello World! Application.

**Unit V:** Lists, Menus, and Other Views – Building the – Intent Code for the .xml File – Intent Code for the .java File – Modifying the AndroidManifest.xml – Using the Menu – Creating the Activity for AutoComplete – Button – Checkbox – Edit Text – RadioGroup, Spinner .

**Text book(s):**

1. J2ME: The Complete Reference, James Keogh, McGraw– Hill/Osborne.
2. Android™, A Programmer's Guide, Jerome (J .F.) DiMarzio.

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**SEMESTER – IV**

**CC 16 - SOFTWARE ENGINEERING**

<b>Subject Code: 17P4CA19</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *Software affects us to an ever-increasing extent, both within industry and in our daily lives. Software Engineering deals with the design and development of high-quality software systems and is thus an increasingly important area of computer science.*

**Unit I:** Introduction –S/W Engineering Paradigm – life cycle models ( water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) – system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

**Unit II:** Functional and non-functional – user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping –S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

**Unit III:** Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems – Real time software design – system design – real time executives – data acquisition system – monitoring and control system. SCM – Need for SCM–Version control – Introduction to SCM process – Software configuration items.

**Unit IV:** Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues – unit testing – integration testing – validation testing – system testing and debugging.

**Unit V:** Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking – Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

**Text book(s):**

1. “Software engineering- A practitioner’s Approach” , Roger S.Pressman, McGraw-Hill International Edition, 5 th edition, 2001.
2. “Software engineering”, Ian Sommerville, Pearson education Asia, 6 th edition, 2000.
3. “Software Engineering Concepts “, Richard E. Fairley, McGraw-Hill edition, 2002.

**References:**

1. “Software Engineering – An Engineering Approach”, James F Peters and Witold Pedrycz, John Wiley and Sons, New Delhi, 2000.

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**SEMESTER – IV**

**EC 4 - FINANCIAL MANAGEMENT & MANAGEMENT ACCOUNTING**

<b>Subject Code: 17P4CA20EC</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:**

- To provide an in depth knowledge of the detailed procedures and documentation involved in cost ascertainment systems.*
- To understand the concepts of Financial Management and its application for managerial decision making.*

**Unit I:** Financial Management: Meaning – Objectives & Scope – functions of Financial Manager – Factors influencing finance functions.

Capital Structure: Meaning – Features – Factors determining Capital Structure – Calculation of EPS.

**Unit II:** Working Capital Management: Meaning – Concepts – Need – Types – Factors affecting Working Capital Requirements – Calculation of Working Capital.

**Unit III:** Management Accounting: Definition – Scope and Functions – Uses – Limitations – Management Accounting Vs Financial Accounting – Management Accounting Vs Cost Accounting.

Ratio Analysis: Meaning – Types and Uses – Calculation of Various Ratios (Excluding Construction of Balance Sheet).

**Unit IV:** Fund Flow Statement: Meaning and Uses - Preparation of Fund Flow Statement. (Simple problems only).

**Unit V:** Cash Flow Statement: Meaning and Uses – Preparation of Cash Flow Statement. (Simple problems only).

**Books recommended:**

1. FINANCIAL MANAGEMENT : SHARMA AND GUPTA
2. MANAGEMENT ACCOUNTING : DR.S.N. MAHESWARI
3. MANAGEMENT ACCOUNTING : R.K. SHARMA AND GUBTA.
4. MANAGEMENT ACCOUNTING : R.S.N. PILLAI AND BAGAWATHI.
5. COST & MANAGEMENT ACCOUNTING : T.S. REDDY & HARI PRASATH REDDY

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**SEMESTER – IV**

**CC 7 - ASP.NET LAB**

<b>Subject Code: 17P4CAP7</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *This course provides students with hands on experience using Visual Studio to create dynamic websites with ASP.NET Web Forms and the .NET 4.0 Framework using C#. This course is bundled with walk-through examples, hands-on lab exercises and a project which enables the students to develop web based applications*

1. Write a script to create an array of 10 elements and arrange them in the ascending or descending order.
2. Write a function in Javascript that takes a string and looks at it character by character and perform all the String manipulation.
3. Create a simple calculator which should perform all the mathematical operations.
4. Create a document and add a link to it. Create a new window on that document. When the user moves the mouse over the link, it should load the linked document on it.
5. Create a document that accepts the user's name in a text field form and displays the same the next time when the user visits the site informing him that he has accessed the site for the second time, and so on.
6. Create a Web form for an online library. This form must be able to accept the Membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the book is to be returned. You can enhance the look of the page by using various ASP.NET controls.
7. Use a calendar control in the page to determine the current date (when the book is borrowed) and calculate the due date, which must be three weeks from the current date. Display the due date to the user.
8. Create an array containing the titles of five new movies. Use this array as a data source for a drop down list control. The page must be capable of displaying the selected movie title to the user when the user clicks on the submit button.
9. Create a virtual directory in IIS. Create a global.asax file and include the "Session\_Start" and "Session\_End" and, "Application\_BeginRequest" and "Application\_EndRequest" events. Write a simple ASP.NET page and execute it in the browser. What is the output that you get?

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**SEMESTER – IV**

**CC 8 - J2ME AND ANDROID LAB**

<b>Subject Code: 17P4CAP8</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *The major objective of this lab is to facilitate the students with J2ME and Android. In this lab, students can design and implement various Mobile Applications.*

1. Design a UI for authentication and display a student details using J2ME.
2. Parse a XML and show the data in a UI using J2ME.
3. Create a PIM application using J2ME.
4. Create and store data in RMS and view the data using J2ME.
5. Connect a server and get response and show in a UI using J2ME.
6. Create Menus and Dialogs in Android Programming.
7. Create Data Storage and view in a UI using Android.
8. Create a program for Accessing Resources in Android Programming.
9. Create a Network based program using Android.
10. Play a Video file using Android.

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**SEMESTER – V**

**CC 17 - OBJECT ORIENTED SYSTEM DEVELOPMENT**

<b>Subject Code: 17P5CA21</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *Object oriented systems development is a way to develop software by building self contained modules or objects that can be easily replaced, modified and reused.*

**Unit I:** Introduction: An Overview of Object Oriented Systems Development - Object Basics – Object Oriented Systems Development Life Cycle.

**Unit II:** Object Oriented Methodologies :Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Patterns – Frameworks – Unified Approach – Unified Modeling Language – Use case - class diagram - Interactive Diagram - Package Diagram - Collaboration Diagram - State Diagram - Activity Diagram.

**Unit III:** Object Oriented Analysis: Identifying use cases - Object Analysis - Classification – Identifying Object relationships - Attributes and Methods.

**Unit IV:** Object Oriented Design: Design axioms - Designing Classes – Access Layer – Object Storage - Object Interoperability.

**Unit V:** Software Quality and Usability: Designing Interface Objects – Software Quality Assurance – System Usability - Measuring User Satisfaction.

**Text book(s):**

1. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill.
2. Martin Fowler, “UML Distilled”, Second Edition, PHI/Pearson Education.  
(UNIT II).

**Reference book(s):**

1. Stephen R. Schach, “Introduction to Object Oriented Analysis and Design”, Tata McGraw-Hill, 2003.
2. James Rumbaugh, Ivar Jacobson, Grady Booch “The Unified Modeling Language Reference Manual”, Addison Wesley.
3. Hans-Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, “UML Toolkit”, OMG Press Wiley Publishing Inc., 2004.

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**SEMESTER – V**

**CC 18 - ARTIFICIAL INTELLIGENCE AND ROBOTICS**

<b>Subject Code: 17P5CA22</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *The Student or a Researcher should be thinking with creativity, without the muck up!*

**Unit I:** Introduction to AI. The Task Domain of AI. AI Techniques. Tic-Tac-Toe Game. State Space Search - Performance Analysis [space, Time] Complexity. Production Systems, Control Strategies: Breadth First Search & Depth First Search. Water Jug Problem. Heuristic Search Techniques: Generate and Test - Simple Hill Climbing - Steepest Ascent Hill Climbing.

**Unit II:** Best First Search - OR Graphs Algorithm : Best First Search. The A\* Algorithm:  $f(s) = g(s) + h(s)$  Problem Reduction AND- OR Graphs. The AO\* Algorithm and Futility. Constraint Satisfaction and its Algorithm.- Means Ends Analysis and its Algorithm. Knowledge Representations: Mappings - Forward Vs Backward Reasoning. Backward -Chaining Rule Systems and Forward - Chaining Rule Systems.

**Unit III:** Combining: The Forward versus Backward Reasoning. Matching - Indexing - Matching with Variables - Conflict Resolutions [ or ] Bi-Directional Meet. Game Playing: Overview of The Minimax Search Procedure. Algorithm: Minimax( Position, Depth, Player) Adding Alpha-Beta Cutoffs. Algorithm: Minimax-A-B (Position, Depth, Player, Use Thresh, Pass Thresh ) Iterative Deepening, Algorithm: Depth First Iterative Deepening. Fuzzy Logic in chess. The AI Languages.

**Unit IV:** ROBOTICS: History, Robot Anatomy, Robot Manipulator and Wrist, Robot co-ordinate systems and Robot controllers.

**Unit V:** ROBOT Arm Kinematics and Dynamics: Matrices Rotations, Transformations, and Manipulators. Matrices of Angles - X, Y, Z in 3' Dimensional View Operations.

**Text book(s):**

1. "ARTIFICIAL INTELLIGENCE" 2<sup>nd</sup> Edition. Elaine Rich & Kevin Knight, pub: Tata McGraw Hill.
2. "ROBOTICS TECHNOLOGY AND FLEXIBLE AUTOMATION". Satya Ranjan Deb. Pub: Tata McGraw- Hill.

**Reference book(s):**

1. "ROBOTICS" Control, Sensing, Vision and Intelligence. K.S. Fu, R.C. Gonzalez, C.S.G. Lee. Pub: McGraw-Hill Book Company.

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**SEMESTER – V**

**CC 19 - DIGITAL IMAGE PROCESSING**

<b>Subject Code: 17P5CA23</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:**

1. To study the image fundamentals and mathematical transforms necessary for image processing.
2. To study the image enhancement techniques. To study image restoration procedures.
3. To study the image compression procedures.
4. To study the image segmentation and representation techniques.

**Unit I:** DIGITAL IMAGE FUNDAMENTALS: Elements of digital image processing systems – Vidicon and Digital Camera working principles –Elements of visual perception - brightness, contrast, hue, saturation, mach band effect, Color image fundamentals - RGB, HIS models, Image sampling, Quantization, dither, Two-dimensional mathematical preliminaries, 2D transforms - DFT, DCT, KLT, SVD.

**Unit II:** IMAGE ENHANCEMENT: Histogram equalization and specification techniques, Noise distributions, Spatial averaging, Directional Smoothing, Median, Geometric mean, Harmonic mean, Contraharmonic mean filters, Homomorphic filtering, Color image enhancement.

**Unit III:** IMAGE RESTORATION: Image Restoration – degradation model, unconstrained restoration – Lagrange multiplier and Constraine drestoration, Inverse filtering- removal of blur caused by uniform linear motion, Wiener filtering, Geometric transformations- spatial transformations.

**Unit IV:** IMAGE SEGMENTATION: Edge detection, Edge linking via Hough transform –  
– Region based segmentation – Region growing –Region splitting and Merging  
– Segmentation by morphological watersheds – basic concepts – Dam construction – Watershed segmentation algorithm.

**Unit V:** IMAGE COMPRESSION: Need for data compression – Huffman - Run Length Encoding - Shift codes - Arithmetic coding - Vector Quantization - Transform coding - JPEG standard - MPEG.

**Text book(s):**

RafaelC.Gonzalez, RichardE.Woods- 'DigitalImageProcessing', Pearson, SecondEdition,2004  
AnilK.Jain, 'FundamentalsofDigitalImageProcessing',Pearson2002

**Reference book(s):**

Kenneth R.Castleman, Digital Image Processing, Pearson, 2006.  
Rafael C.Gonzalez, Richard E.Woods, Steven Eddins,'Digital Image Processing using MATLAB', PearsonEducation, Inc., 2004  
D,E.Dudgeon and RM.Mersereau,'Multidimensional Digital Signal Processing', Prentice Hall Professional Technical Reference,1990.  
William K.Pratt,'Digital Image Processing', John Wiley, New York, 2002  
Milan SonkaetaI,'IMAGE PROCESSING, ANALYSIS AND MACHINEVISION', Brookes/Cole,Vikas Publishing House, 2<sup>nd</sup> edition,1999.



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**SEMESTER – V**

**CC 20 - DIGITAL ASSET MANAGEMENT**

<b>Subject Code: 17P5CA24</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:**

- *To understand the ways and means of creating digital content.*
- *To understand the methods of storing large digital content.*
- *To know the basics of Content Management.*
- *To know the key design issues of Content Management Systems.*
- *To know the key technologies to build Content Management Systems.*

**Unit I:** CREATING DIGITAL CONTENT: Digital Primer, Any Content – Anywhere, , Digital Content Consumer, Tools and the Trade, Digital Recording, CGI and Digital Content Creation, Digital Audio, Rich Media, Streaming Media, Digital Interactive Television and Digital Cinema.

**Unit II:** COMPRESSING AND INDEXING: Document Databases, Compression, Indexes, Text Compression, Indexing Techniques, Image Compression, Mixed Text and Images.

**Unit III:** CONTENT MANAGEMENT: Systems for Managing Content, The Enterprise Content Management System (CMS), Major parts of a CMS, Need for a CMS, Roots of Content Management, Branches of Content Management.

**Unit IV:** DESIGN OF CMS: The Wheel of CMS, Working with Metadata, Cataloging Audiences, Designing Publications, Designing content Components, Accounting for Authors, Accounting for Acquisition sources.

**Unit V:** BUILDING CMS: Content Markup Languages, XML and Content Management, Processing Content.

**Text book(s):**

1. John Rice and Brian Mckerman (Editors), Peter Bergman, “Creating Digital Content”, McGraw-Hill, USA, 2001[UNIT 1].
2. Ian H Witten, Alistair Moffat, Timothy C Bell, “Managing Gigabytes Digital Press, USA, 1999 [UNIT 2].
3. Bob Boiko, “Content Management Bible”, John Wiley & Sons, USA, 2001 [UNITS 3, 4, 5].

**Reference book(s):**

1. Abdreas Ulrich Mauthe and Peter Thomas, “Professional Content Management Systems – Handling Digital Media Assets”, John Wiley & Sons, USA, 2004.
2. Dave Addey, James Ellis, Phil Suh, David Thiemecke, “Content Management Systems (Tool of the Trade)”, Apress, USA, 2003.

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**SEMESTER – V**

**EC 5 - MOBILE COMMUNICATION**

<b>Subject Code: 17P5CA25EC</b>	<b>Credits: 4</b>	<b>External Marks: 75</b>	<b>Hours: 4</b>
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**Objectives:** *To understand the concepts of Mobile and wireless devices, Mobile IP and WAP.*

**Unit I:** Introduction – Medium Access Control : Motivation for Specialized MAC– – FDMA– TDMA– CDMA– Comparison of Access mechanisms – Tele communications : GSM – Mobile Services – System Architecture – Radio Interface – Localization and Calling – Handover – Security – Satellite Systems: Basics– Routing– Localization – Handover – Broadcast Systems: Overview – Cyclic Repetition of Data– Digital Audio Broadcasting – Digital Video Broadcasting.

**Unit II:** networks – Wireless LAN: Infrared Vs Radio Transmission – Infrastructure Networks – Ad hoc Networks– IEEE 802.11 – System Architecture – Protocol Architecture – Physical Layer– Frequency hopping spread spectrum – Direct sequences spread spectrum – Medium access control layer – HIPERLAN: Historical HIPERLAN – WATM – BRAN – HiperLAN2.

**Unit III:** Mobile network layer – Mobile IP : Goals – Assumptions and Requirement – Entities and Terminology – IP packet Delivery – Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6 – Dynamic Host Configuration Protocol – DHCP – Mobile Ad hoc Networks – Routing– Destination sequence distance vector – Dynamic Source Routing – Alternative Metrics.

**Unit IV:** Mobile transport layer – Traditional TCP – Congestion control – Slow start– retransmit/fast recovery – Implications of mobility – Classical TCP improvements: Indirect TCP – Snooping TCP – Mobile TCP – Fast retransmit/ Fast Recovery – Transmission/ Timeout Freezing – Selective Retransmission – Transaction Oriented TCP.

**Unit V:** WAP – Wireless Application Protocol– Architecture –Wireless Datagram Protocol – Wireless Transport Layer Security – Wireless Transaction Protocol – Wireless Session Protocol – Wireless Application Environment – Wireless Markup Language – WML Script – Wireless Telephony Application.

**Text book(s):**

1. J.Schiller, Mobile Communication, Addison Wesley, 2000.

**Reference book(s):**

1. William C.Y.Lee, Mobile Communication Design Fundamentals, John Wiley, 1993.
2. William Stallings, Wireless Communication and Networks, Pearson Education, 2003.
3. Singhal, WAP– Wireless Application Protocol, Pearson Education, 2003.

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**SEMESTER – V**

**CC 9 - CASE TOOLS LAB (OOAD & UML)**

<b>Subject Code: 17P5CAP9</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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**Objectives:** *Computer-Aided Software Engineering(CASE) technologies are tools that provide automated assistance for software development. The goal of introducing CASE tools is the reduction of the time and cost of software development and the enhancement of the quality of the system developed.*

1. Case study:
  - A) Brief introduction to RUP.
  - B) Introduction to all tools in Rational.
2. Project registration, User creation, Group creation using rational administrator tool.
3. To performing the following experiments.
  - a) Writing problem statement for a specific problem (such as course registration).
  - b) Analyzing the problem statement.
  - c) Identifying use cases.
  - d) Identifying actors.
4. Requirement analysis for problem (course registration) using rational requisite pro.
  - a) To create a stakeholders requirement.
  - b) To create a feature requirement.
  - c) To create a usecase requirement .
  - d) Create Traceability tree, traceability matrix and attribute matrix.
5. Creation of various use reports in requisite pro using Soda.
6. Drawing use case diagram.
7. For each identified use case draw the following.
  - a) Activity diagram
  - b) Sequence diagram
  - c) Collaboration diagram.
8. Drawing class diagram in Logical View.
9. To evaluate class to sequence diagram
10. Creating a test plan.
11. Generating reports in Test Manager using Soda.

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**SEMESTER - V**

**CC 10 - MINI PROJECT (IS DEVELOPMENT LAB)**

<b>Subject Code: 17P5CAP10</b>	<b>Credits: 2</b>	<b>External Marks: 60</b>	<b>Hours: 3+2</b>
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