Name of the Institute: Institute of Technology
Programme: Master of Computer Application

SEMESTER I

3CA1101 Programming   L   T   P   C
Language – I   3   -   4   5

Introductory concepts, types of programming languages, introduction to C, Data representation, Flow charts, Algorithms / Pseudo Code, Program structure, Decision control statements, Control structures, Functions, Pointers, types of pointers, Pointer handling, Arrays, passing array to function, Pointers and arrays, Strings, Structures, Accessing structures, array of structures, File handling, formatted inputs & output to file, structures and file error handling, Preprocessor directives.

3CA1107 Mathematical   L   T   P   C
Foundation   3   1   -   4

Boolean Algebra: Introduction, definition and important properties, direct product and homomorphism, atoms, antiatoms, stone's representation theorem, Boolean expressions and their equivalence, minterms and maxterms, values of Boolean expressions, canonical forms, Boolean functions, symmetric Boolean expressions. Fuzzy Sets definitions, basic operation, image & inverse image, fuzzy relations, Linear Equations and Matrices: Brief review of the theory of matrices, elementary row and column operations, rank of matrix, inverse of a matrix, solution of system of liner equations, Cramer's rule, Cayley-Hamilton theorem, Linear-transformation, orthogonal transformation, reduction to diagonal form, bilinear forms, quadratic forms,Vector Space: Definitions and examples of vector spaces, linear combinations, linear dependence and linear independence, bases, subspaces, calculus of subspaces, dimension of a subspace.

3CA1103   Fundamentals of   L   T   P   C
Computer   4   -   2   5
Organization

Electronic Digital Computers, Different Types of Computer System, Basic Components of a Digital Computer, Number Systems, Boolean Algebra and Gate Networks, Interconnecting Gates, Sum of Products and Products of Sums, NAND Gates and NOR Gates, K-Map Method, Don't –Cares, PLAs and PALs, Flip-Flop and Designs, Clocks, Registers and Counters, The Arithmetic and Logic Unit ,Adder and its Design ,Shift, logical and Basic operations, Types of Memories, Decoders, Virtual and Cache Memories, Buses, Interfaces and Control Unit, I/O Addressing Techniques, Control Unit, Register Transfer Language, and Microprogramming, Instruction Format and

Representation ,Addressing Techniques ,8 bit 16 bit and 32 bit Microprocessor, I/O Devices.

3CA1104 Accounts and   **L T P C**
     Financial Management   **3 1 - 4**

Introduction of Accounting, Financial Accounting, Accounting Principles (Rules of Debit & Credit), Traditional Approach, Balance-Sheet Approach, Journal, Ledgers and Trial Balance, Financial Statements, Interpreting Financial Statement, Ratio Analysis, Fund Flow Analysis, Cash Flow Analysis, Cost Accounting, Elements of Cost, Cost Classification and Cost Sheet, Inventory Valuation (FIFO & LIFO), Management Accounting, Marginal Costing and Break – Even Analysis, Budgets and Budgetary Control, Project Management (Capital Budgeting), Financial Management: Cost of Capital, Leverages, Working Capital Management, Case study of Financial Accounting Software Package.

3CA1105 Basic   **L T P C**
     Microcomputer   **- - 4 2**
     Applications

Disk Operation System, Dos Shell, Batch Files, Internal and External Commands, Config . Sys, Autoexec . Bat, Command . Com, Input, Output, Redirection, Wildcard Characters, Windows, Advantages of Windows Over Dos, Windows Architecture, Concept Of GUI, Elements of GUI – Menu Bar, Dialog Box, Check Box, Radio Buttons, Basic Operations of MS-Word and Power Point, Ms Excel, Ms Access, Financial Accounting Software. Introduction to LINUX, Basic Operations in LINUX OS, Disk Organization, Manipulation of Files and Applications, Comparison with Windows OS.

3CA1108 Database   **L T P C**
     Management   **3 - 2 4**
     System – I

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Database Concepts: File Systems and Databases, Introducing the database, The Historical Roots of the Database files and file systems, Database of Systems, Models, and Evolution of Data Models. The Relational Database Model, Logical view of Data, keys, Integrity Rules. Relational Database Operators, The Data Dictionary and system Catalog, Relationships, concepts of Design and Implementation, Entity Relationship Modeling: Basic modeling concepts, Data Models: Degrees of Abstraction, The Entity Relationship model, the Challenge of database Design, Normalization of database tables: Database Tables and Normalization, Normalization and Database Design, Higher Level Normal Forms, De-normalization, Structured Query Language: Data Definition Commands, Data Manipulation Commands, Queries, Advanced Data Management commands, More complex Queries and SQL Functions, Updateable Views, Converting an E-R Model into a Database Structure, General Rules Governing Relationships Among Tables, Advance Database Concepts: Security authorization, Encryptions and authentication, Transaction

Management and Concurrency Control: DBMS transaction, Concurrency Control, Concurrency Control with locking methods, Concurrency control with optimistic Methods, Database Recovery Management.

3SP1102 Communication L T P C
 Skills for - 2 - -
 Computer
 Professionals

Communication Skills in English; Meaning, Process, Types, Flow of communication. Non-verbal Communication: Components, Barriers to Communication. · Listening Skills: Types, Process, Barriers to Effective Listening, Tips of Listening Effectively · Speaking Skills: Presentations, Group Discussion, Personal Interview. · Reading Skills: Skimming, Scanning, Analytical, Extensive, Intensive. · Writing Skills: Technical Instructions, Report Writing, Memo Writing, Job Application and Resume, Business Correspondence. Vocabulary Enrichment: Words often confused and misused, One-word substitutes, Idiomatic Expressions.

MCA SEMESTER – II

3CA1201 Introduction to L T P C
 Microprocessor & 3 - 2 4
 Assembly Language
 Programming

Intel 8086 / 88 Architecture, Assembly language programming, Modular Programming, Byte and String manipulations: String Instructions, REP prefix, Text Editor example, Table translation, number format conversion, Introduction to 16-bit microprocessors, 8086 architecture, segments, flags Instruction set assembly language programming on 8086 using assembler, interrupts, writing interrupt services routines, debugging programs, Study of contemporary microprocessor, Pentium, RISC, CISC Architecture & its implications, Special purpose processor as DSP, micro controller.

3CA1202 Data and File L T P C
 Structure 4 - 2 5

Introduction to Data Structures, Data Management concepts, Data type, Data Structures Simple, Linear and non Linear, File Structures, Program development process, program testing, Development and verification of algorithms, time and space analysis, Types of Data Structures and Algorithms, B- trees, B+ trees & mapping & traversal of trees & graphs, Stack Queues, Linked Lists, Trees & Graphs, Sorting and Searching, Height Balance Trees, Weight Balance Trees,2-3 Trees, Tree Structures, File Structures Multi key file organizations.

3CA1203 Programming   **L   T   P   C**
          Language – II   **3   -   2   4**

Principles of object oriented Programming, Introduction to object oriented programming , Introduction to C++ : Compilation, Linking, Basic statements, Tokens, Expressions, Control structures, Functions, Classes and objects, Constructors and Destructors Dynamic, overloading, Operator overloading and type conversions, Inheritance, Virtual base class, constructors in inheritance, Pointers, File handling, Templates, Exception Handling

3CA1204 Computer Oriented   L   T   P   C
          Numerical Methods   4   -   2   5

Computer Arithmetic, Floating point representation of numbers, Arithmetic operations with normalized Absolute, relative and round off errors Error propagation, Solution of Non linear Equation by iterative methods ,Solution of Non linear systems of equations for two variables by Newton-Raphson method. Roots of polynomial Equations, Interpolation by polynomial approximations, Cubic Splines, Inverse interpolation , linear and non linear regression using least square approximations, Approximation of function by Taylor's series and chebyshev polynomials, Numerical Differentiation and Integration, Solution of system of linear equations, Algebraic Eigen value problem, Numerical solution of ordinary differential equations.

3CA1207Database   **L   T   P   C**
Management Systems –II

          3   -   2   4
                                       w**.e.f : 2010-11**

Basic Concepts of PL/SQL, Records, SQL, Cursors, Error Handling, Collections, Creating Procedures, Functions, Packages, Database Triggers, Oracle Physical, Logical Architecture, Database Architecture: Oracle Architecture, Databases and Instances, Background Processes: Internal Database Structure: Tables, Columns and Data type. Constraints, Schema, Indexes, Clusters, Hash Clusters, Views, Segments, Extents and Rollback Segments, Context Area, Program Global Area, Backup Recovery Capabilities, Security Capabilities, Planning and Managing Tablespaces, Managing the Development process: Cultural Processes, Management Processes, Technology: CASE Tools, Managing Package Development, Managed Environment, Managing Transactions, Database Tuning and Performance: Rollback Segments, space usage within rollback Segments, Monitoring Rollback Segment Usage, Database Tuning, Distributed Database Management Systems: Evolution Distributed Database Management Systems, Distributes Processing and distributed databases, DDBMS components, Levels of Data and process distribution, Distributed database transparency features, Distribution Transparency, Transaction, Performance Transparency and Query Optimization, Distributed Database Design, Data Fragmentation, Data Replication, Data Allocation. Object Oriented Databases and its benefits, Evolution of Concepts, Characteristics of Data Model, OODM and previous Data Models: Similarities and differences, Object oriented Database

Management System, advantages, disadvantages, relational model, generation of Database Management System.

3CA1206 Software Project   **L   T   P   C**
           Lab
                              -   -   2   1

Students have to use the knowledge of Data and File structure, Programming Language C & C++ for developing software project. During the whole semester students will develop the software project in the laboratory hours, which is two hours in a week.

MCA – SEMESTER – III

3CA1404 System Analysis   **L   T   P   C**
           And Design   **3   1   -   4**

System Analysis Fundamentals: Role of the System Analyst, Organizational Style and its impact on Information System, Feasibility and Managing Analysis and Design activities. Information Requirements Analysis: Sampling and Investing Hard Data, Interviewing, Prototyping and Rapid Application Development. The Analysis Process: Using Data Flow Diagrams, Analyzing Systems Using Data Dictionaries, Describing Process Specifications and Structured Decisions, Semi structured Decision Support Systems, Preparing the System Proposal, Essentials of Design: Designing Effective Output & Input Designing Effective Databases, Designing User Interfaces, Designing Accurate Data-Entry Procedures. Software Implementation: Quality Assurance through Software Engineering, Implementing the Information System, Object-Oriented System Analysis and Design and UML.

3CA1302 Operating System   **L   T   P   C**
                              4   -   2   5

Computer System Overview, Operating System Overview, Process Description and Control, Threads Processes And Threads , Symmetric Multiprocessing, Micro kernels, Concurrency, Memory Management and Virtual Memory, Memory Management Requirements, Partitioning, Paging, Segmentation , Virtual Memory , Case Study For Memory Management, I/O and File Management, I/O Buffering, Disk Scheduling, Disk cache, File organizations secondary storage management, shell scripts & unix system architecture.

3CA1303 Data   **L   T   P   C**
           Communication & **3   -   2   4**
           Networking – I

Introduction to Computer Networks, Communications Channel Characteristics, Modulation and Demodulation, Digital Communications, The Physical Layer, Transmission Media, Circuit Switching and The Telephone System, Data Link Layer:

Data Link Layer Design Issues, Elementary data link protocols, Sliding window protocols, Medium Access Sub-layer, Channel Allocation, Multiple access protocols, IEEE 802.3 & Ethernet, Bridges, Network Layer, Design Issues, Routing Algorithms Congestion control algorithm, Internetworking.

3CA1304 Computer Based   L   T   P   C
**   Management System 3   1   -   4**

Meaning and role of MIS, Introduction of MIS and System Approach, Systems view of Business, MIS org. within the company. Management, Organization and the Networked Enterprise, Infrastructure, Management and Organizational Support Systems for the Digital Firm, Demand and Sales Forecast, Production function, Determinants of cost and cost concepts, Determinants of price, Different market structure   and pricing, conditions of equilibrium of a firm under different market structures, Banks and its instrument, Inflation-its causes and consequences, measures to control it, National Income concepts- Measurement of national income, National income statistics, International Trade : Its basis, Balance of Payments, Disequilibrium in balance of payments, Corrective measures, Free trade Vs. Protection, Trade of Business cycles- their causes and consequences, Controlling business cycles, Capital market- its structure, importance and stock exchanges.

w.e.f : 2011-12

3CA1308 Client Server   L   T   P   C
**   Architecture &   3   -   4   5**
**   Application – I**

Introduction, Distributed Processing, Two tier versus Three tier C/S model, Component object model, service model, C/S deployment, Microsoft visual basic: Exploring the visual studio IDE, working with toolbox control, working with Menus, Toolbar & dialog boxes, Fundamentals: Visual basic variables and formulas and the .NET framework, using Decision structures, loops and Timers, Debugging, Creating modules and procedures, Using arrays to manage numeric and string data, working with collections and the system collections, Exploring text files and string processing. Designing the user Interface: Managing windows, control menus at runtime, adding graphics and animation effects, inheriting forms and creating base classes, working with printers, Database and Web Programming, Getting started with ADO.NET, Data presentation using the DataGrid View control, Creating web sites and web pages by using visual web developer, Introduction to web Technologies: HTML: HTML introduction, elements, attributes, Headings, paragraphs, formatting, styles, links, images, Tables, Lists, forms, colors, layout,frames, XHTML introduction, XHTML why, XHTML vs HTML, XHTML syntax, XHTML validation, XHTML modules, CSS Introduction, Syntax, CSS how to, background, text, font, box model, outline, margin, list, table.

3CA1307 Java Programming   L   T   P   C
                             -   -   2   1

Introduction To OOPS, Characteristics, Advantages, OOPs Vs Structured Programming, Introduction Java Programming with Grammar of Java: Java Features, Java Tokens, Data Types, Variables, Operators, Conversion, Casting, Control Structure, Selection Statement, Nested if-else Statement, Ternary if-else Operator, Switch Statement, Iterative Statement, Nested Loops, Break Statement, GOTO Statement , Continue Statement, Arrays, Strings & Vectors, Single-Dimensional Array, Array Initialization, Two Dimensional Arrays, Multidimensional Arrays, Variable Size Arrays, Strings, Vector, Wrapper Classes, Classes & Objects: Classes, Method Overloading, Constructors and Garbage Collector, Static Class Members, Recursion, Nested and Inner Classes, Inheritance, Interfaces and Dynamic Binding, Inheritance, Method Overriding, Multilevel Inheritance, Access Specifiers, Dynamic Binding, Abstract Classes and Methods , The final Keyword, Interfaces, Extending Interfaces, Grouping Interfaces, Packages: Java's Built-In Packages, Creating User-Defined Packages, Importing Packages, CLASSPATH, Ambiguities in Importing Packages, Exception Handling, Multiple Catch Handlers, Nested Try and Catch Blocks, Multithreading, Threaded Basics, Creating, Running, Thread Control Methods, Life Cycle of a Thread, Thread Priorities, Thread Exceptions, Synchronizations, Inter Thread Communication, Files and Streams: Java Streams, Byte Streams , Character Streams , File Stream, The High-Level Stream Classes, Predefined Streams, Reading Console Inputs, Reading data form Command Line, AWT, Layout Managers, Event Handling, Applets

3SP1201 Career Orientation   L   T   P   C
                               -   1   -   -

The objective of the supplementary course of Career Orientation is to sensitize each student about one's own potential, and this in turn will enable one to be self driven so as to improve one's performance and achieve one's life goals.
The topics covered are: Self start, dedication, confidence, motivation, discipline, study, progress, evaluation, appreciation, criticism, improvement reliance, control, respect, satisfaction, awareness, fulfillment and realization, inwardly directed towards oneself.

MCA SEMESTER – IV

3CA1501 Software   L   T   P   C
       Engineering   3   1   -   4

Introduction: Software products, the software process, Software models: Waterfall Model, Incremental Model, Evolutionary Model, Boehm's spiral model, Process visibility, professional responsibility, computer based system engineering, Requirements & Specification: Requirements engineering, Project Management, Configuration

Management ,Design Concept And Methods, Dependable Systems, Software Quality Assurance: Quality Models; ISO9000 standards, Capability Maturity Models, Change Request management, Verification and Validation, Case Tool ,Rational Tools, Introduction to Rational Unified process and Rational Tools, Maintenance and Evolution: Client/Server software engineering; software maintenance; configuration management; software re-engineering; software reverse-engineering, Introduction to Capability Maturity Model.

3CA1402 Computer Graphics
L	T	P	C
4	-	2	5

Overview of Graphics Systems: Introducing application areas of computer Graphics, Various Display Devices, Input Devices, Logical classification of Input devices, User dialogue, Graphics Primitives, Filled Area Primitives, Attributes of output primitives & Antialiasing, Two Dimensional Transformation: Basic Transformations, Composite Transformation, Transformation between Coordinate Systems, Windowing And Clipping (2D): Two Dimensional Viewing , Point & Line Clipping, Polygon Clipping, Structures and Hierarchical Modeling, Three Dimensions: Three Dimensional Display Methods, 3D Object Representation, Spline Representation, Cubic Spline Interpolation Methods, Bezier Curves and Surfaces, 3D Geometric and Modeling Transformation, 3D Viewing.

3CA1403 Data Communication & Networking – II
L	T	P	C
4	-	2	5

The Application Layer: DNS, Electronic Mail, Security Data Link Layer Protocols: Requirement and functioning, Network Layer Protocols, Understanding IP addresses and various classes, IP protocol, Datagram Approach, Routing IP Datagrams , ICMP ,IP Sub netting and Super netting, Internet Security and Firewall, Ipv6 and various issues Transport Layer Protocols : Connection-less V/S. Connection oriented protocols , UDP ,TCP .Application Layer Protocols : BOOTP and DHCP- File Transport Protocol, – TFTP, NFS, SMTP, TELNET - Applications and Functions, Socket Programming, IP Sec, Mobile IP. IPNAT

3CA1301 System Software
L	T	P	C
3	-	2	4

Language Processors, Grammer & Type of Grammer, Data Structures Heap & Heap Allocation, Sorting Methods, Scanning and Parsing, Assemblers, Design of Two Pass Assembles, Macro Processors, Design of Macroprocessors Loader and Linkers, Introduction to Compilers, Editors and Debuggers, Device Drivers

Elective – I
3CA1415 Parallel Processing L   T   P   C
                              4   -   2   5

Parallel programming Platforms: Implicit Parallelism, Shared Memory Multiprocessing, Distributed Shared Memory, Message Passing Parallel Computers, Temporal Parallelism, Data Parallelism, Data Parallel Processing With Specialized Processors, Physical Organization of Parallel platforms, Communication Costs in Parallel Machines, Routing Mechanism for Interconnection Networks. Programmability Issues. Operating System Support , Types Of Operating Systems, Principles of Parallel Algorithm Design, Parallel Algorithm Models, Basic Communication Operations, Analytical Modeling of Parallel Programs, Various Performance metrics, Scalability Metrics, Serial Fraction Component analysis, The Message Passing Paradigm/Distributed Computing: Message Passing Model, General Model, Programming Model MPI : Collective Communication and Computation Operations, Introduction to PVM, Programming Shared Address Space Platforms: Processes & Shared Memory Programming, Parallel Programming Techniques. Overcoming data dependencies, Thread-Based Implementation, Parallel Formulation for Practical Architectures scheduling concepts.

Elective – I
3CA1425   ArtificialL   T   P   C
Intelligence
                              4   -   2   5

Introduction to Prolog, Problems and State Space Search: The AI Problems, AI Techniques. Production Characteristics and Issues in the Design of Search Programs, Heuristic Search Techniques: Generate-And-Test, Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction, Means-Ends Analysis. Knowledge Representation, Predicate Logic, Probability and Bayes' Theorem, Certainty Factors and Rule-Base Systems, Bayesian Networks, Fuzzy Logic, Natural Language Processing, Expert systems, Knowledge Acquisition, Connectionist Models: Introduction: Hopfield Network, Learning In Neural Network, Application Of Neural Networks, SOM, Neocognitron, Supervised & Unsupervised Learning, ART, ART1, Maxnet, Competitive Learning, Recurrent Networks, Distributed Representations, Connectionist AI And Symbolic AI.

Elective – I
3CA1435 Compiler   L   T   P   C
        Construction   4   -   2   5

Overview of The Translation Process, Lexical analysis : Hard Coding And Automatic Generation Lexical Analyzers Parsing Theory : Top Down And Bottom Up Parsing Algorithms, Automatic Generation Of Parsers .Error Recovery : Error Detection & Recovery, Ad-Hoc And Systematic Methods Intermediate Code Generation: Different Intermediate Forms, Syntax Directed Translation Mechanisms and Attributed

Mechanisms and Attributed Definition, Run Time Memory Management: Static Memory Allocation And Stack Memory Allocation Schemes, Symbol Table Management, Code Generation: Machine Model, Order Of Evaluation, Register Allocation And Code Selection, Code Optimization: Global Data Flow Analysis, A Few Selected Optimizations like Command Sub Expression Removal, Loop Invariant Code Motion, Strength Reduction Etc.

w.e.f : 2011-12

3CA1407 Client Server   **L   T   P   C**
Architecture &   **3   -   2   4**
Application - II

Fundamentals: Introduction three-tier Client Server systems, Web Application basic, ASP.NET fundamentals, the page rendering model, custom rendered controls, Composite controls, control potpourri, ASP.NET Server control and client-side scripts: Applying Styles to Server Controls, HTML Server Controls, Manipulating Pages and Server Controls with JavaScript, Client-Side Callback, Advanced Features: Web parts, a consistent look and feel, configuration, logging in, Data binding, web site Navigation, personalization, Caching and State Management: Session state, application data caching, caching output. Diagnostics and plumbing: Diagnostics debugging, the Http Application class and HTTP modules, custom handlers. Working with XML: Overview, The Basics of XML, Reader and Writer, Document and Path Document, DataSets, the XML DataSource Control, Databases and XML, Services, AJAX, Deployment and Silver light: ASP.NET web services, windows communication foundation, AJAX, ASP.NET and WPF content, how web application types affect deployment, Case Study: Introduction to J2EE Architecture

MCA - SEMESTER – V

3CA1401 Computer Based   **L   T   P   C**
Optimization   **4   -   2   5**
Methods

Introduction to Operation Research: Operation Research approach, scientific methods, Introduction to models and modeling techniques, General methods for Operation Research models, methodology and advantages of Operation Research History of Operation Research, Linear Programming (LP): Graphical solution method, Maximization – Simplex Algorithm, Minimization – Simplex Algorithm using Big-M method, Two phase method, Duality, Transportation & Assignment Problems, Variations in transportation problem, Introduction to assignment problems, Variations to assignment problems. Integer Programming, Sequencing: Processing N jobs through two Machines, Processing N jobs through three Machines, Processing N jobs through m Machines, Network Analysis: Network Definition and Network diagram, Probability in PERT analysis , Project time Cost Trade off , Introduction to resource smoothing and allocation, Queuing Models, Inventory Model, Simulation

3CA1507 Object Oriented   L   T   P   C
**   Analysis & Design 3   -   2   4**

Object Modeling Technique, Unified Modeling Language: Introduction to UML, Basic Structural Modeling, Common Modeling Technique for Modeling Classes, relationships, Diagrams Interfaces, Packages, Instances object Diagram. Behavioral Modeling, Common Modeling, technique for Modeling, Interactions, use cases, use case Diagram Interaction diagrams, Events state machines. Architectural Modeling, CMT for modeling components, deployment & Diagrams, Object Oriented Technologies, RMI, Servlets.

Elective – II
3CA1513 Data Warehousing L   T   P   C
**   And Data   Mining 4   -   2   5**

Data Warehouse Architecture, System Process, Extract and load, Clean and transform, Backup and archive, Query management. Process architecture, Database schema , Starflake schema, Partitioning strategy, Data Marting, Meta Data, Data Tran formulation and load, Data management, Query generation, Metadata and tools, Warehouse manager, Query manager, Hardware and operational design : Security, Backup and recovery, Capacity planning, Methodology, Data Mining, The knowledge discovery process, Query tools, statistical techniques, OLAP, k-nearest neighbor, decision trees, association rules, neural networks, genetic algorithms, Setting the Knowledge Discovery in Database (KDD) environment, Learning as compression of data sets, Noise and redundancy, Fuzzy databases, Denormalization, Data mining primitives, Case study

Elective – II
3CA1523 Data Encryption & L   T   P   C
**   Security   4   -   2   5**

Introduction, conventional Encryption: Classical Techniques, Modern Techniques. Algorithms, Confidentiality Using Conventional Encryption, Public-key encryption and hash functions. Public-key cryptography, Message authentication and hash functions, Digital signatures and authentication protocols, Authentication Applications, Electronic Mail Security, IP Security, Web Security. Network security practice, System Security

Elective – II
3CA1533 Distributed Systems L   T   P   C
**   4   -   2   5**

Definition of a distributed system, goals, hardware & software concepts, the client-server model, Communication: Layered protocols, RPC, remote object invocation, message-oriented communication, Processes, Threads , Naming: Naming entities, Synchronization: clock synchronization, logical clocks, global state, election algorithms, Consistency and replication: Data-centric consistency models, client-centric consistency models, distribution protocols, consistency protocols, Fault tolerance, Security,

Distributed object-based system: CORBA, RMI, distributed COM, GLOBE, Distribute file systems: SUN network file system, the CODA file system, Distributed document-based systems: the World Wide Web, Lotus Notes, Distributed coordination-based systems: JINI

w.e.f : 2010 -11

Elective – II
3CA1543 Enterprise Application L   T   P   C
          Development
          Technologies   4   -   2   5

Introduction: What is an Enterprise, Architectures, Solutions and J2EE, J2EE Architecture, Client Tier **:** Importance of Client Tier, Components of client Tier HTML clients, Applet Clients, Midlet Clients, Java App clients , Web Services Clients and containers of Client Tier, Presentation Tier : Web Tier, Web Container, Web Components : Servlets , Filters, JSP. MVC Architecture and Web tier, Design Patterns in Web Tier, Business Tier: Importance of Business Tier, Business Components : Session Beans , Entity Beans, Message Driven Beans MVC Architecture and Business tier, Design Patterns in Business Tier, EIS Integration Tier : ES Systems , EIS Integration Schemes : using JDBC API's , JMS, J2EE Connector Architecture, Services : Transaction, Transactions , JTS, JTA, Transactions in Business Tier. Security, Persistence Mechanism : Hibernate , Introduction and comparison with alternate Techniques. Frameworks : Spring, Service Oriented Computing : Challenges and Benefits, Service Oriented Architecture, Web Services and J2EE , SOAP , WSDL, Web Service Registries : UDDI, eb XML. WS standards and specification, Web Services Security. Web Service Interoperatibility, SOA BPEL.

Elective – III
3CA1514 Mobile Computing L   T   P   C
          And Wireless   4   -   2   5
          Networking

Introduction: Applications, Reference model, Wireless Transmission: Frequency for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread spectrum, Cellular Systems, Medium Access Control: Reasons for specialized MAC, SDMA, FDMA, TDMA, CDMA, Telecommunications systems: GSM, HSCSD, GPRS, Satellite systems: Applications, GEO, LEO, MEO, Routing, Localization, Handover ,Wireless LAN: IEEE 802.11, WiMAX, Bluetooth ,Mobile network layer: Mobile IP, DHCP, Mobile ad-hoc networks, Mobile transport layer: Traditional TCP Congestion control, Slow start, Fast retransmit/fast recovery and implications of them on mobility, TCP improvements for mobility, TCP over 2.5/3G wireless networks, Performance enhancing proxies, Support for mobility: File systems, World wide web, Wireless application protocol

Elective - III
3CA1524 Multimedia System L   T   P   C

4 - 2 5

Multimedia Systems Design, Compression and Decompression ,Data and File Format Standards , Multimedia Input/Output Technologies, Storage and Retrieval Technologies, Architectural and Telecommunication Considerations, Multimedia Application Design, Multimedia Authoring and User Interfaces, Hypermedia Messaging, Distributed Multimedia Systems, System Design, Multimedia Systems Design Example : Determining Enterprise Requirements, Business Model for IFC, Business Information Model for IFC, Architectural Recommendation and Technology Feasibility, Modeling the Objects, Analyzing performance Requirements, Design Considerations, Designing Storage Distribution, Optimizing Network Transportation

Elective – III
3CA1534 Image Processing   L   T   P   C
                              4 -   2   5

Introduction : Digital Image Representation, Fundamental Steps In Image Processing, Elements Of Digital Image Signal Processing Systems, Digital Image Fundamentals : Elements Of Visual Perception , Image Signal Representation, Imaging System Specification, Building Image Quality, Image Transforms, Image Enhancement , Image Restoration, Image Segmentation, Image Compression, Representation, Recognition

3CA1505 Seminar   L   T   P   C
                              -   -   2   1

The objective of seminar is to develop the communication skill and deliver the seminar to their guide along with the students. Seminar can be selected from subject covered in the syllabus or from the advance topics.

 3CA1506 Minor Project   L   T   P   C
                              -   -   6   3

To provide the students with experience in analyzing, designing, implementing and evaluating information systems. It is part time project in 5th semester. Students are assigned one or more system development projects. The project Development involves part or all the system development life cycle.

MCA SEMESTER – VI

3CA1601 Major Project   L   T   P   C
                              -   -   -   15

The VIth semester Major Project should be modeled on the lines of a post-graduate (M..Tech. dissertation project). The subject area of the project should be related to the current or future status of Computer Applications. The scope extended in the Academic / Laboratory / Applications content should be commensurate with a meaning full and effective engagement for a full semester (14 weeks) project of the VIth semester.

Major component of the project should include Identifying the system, deciding the aims and objectives to be achieved, modules to be studied, analysis, innovations / research, laboratory / applications studies and final evaluation in terms of result achieved. The report should follow the style of P.G. Dissertation report.