

## **COURSE SPECIFICATION**

**Choice based Credit System (CBCS)  
Scheme and course structure for  
Information Technology 2<sup>nd</sup> semester effective from academic session 2016 and onwards**

Course Code	Name of the Subject	Paper Category	Hours/Week			Credits
IT16301CR	Data Warehouse	Core(CR)	3	0	2	4
IT16302CR	Dot Net Technologies	Core(CR)	3	0	2	4
IT16303CR	Computer N/W	Core(CR)	4	0	0	4
IT16304DCE	S/W Engineering	Elective (DCE)	3	0	0	3
IT16305DCE	Design & Analysis of Algorithms	Elective (DCE)	3	0	0	3
IT16306GE	Multimedia Systems	Elective (GE)	3	0	0	3
IT16307GE	Management Information systems	Elective (GE)	3	0	0	3
IT16308OE	Fundamentals of Grid and Cloud Computing	Elective (OE)	3	0	0	3
IT16309OE	Discrete Mathematics	Elective (OE)	3	0	0	3
24 Credits						

**Course Code: IT16301CR**  
**Course Title: Data warehousing**

**Unit I**

Data warehouse: Definitions, features, building blocks/ components, data marts, Meta data in data warehouse; planning a data warehouse, The project team, project management considerations, Business requirements; data design, the architectural plan, Data storage specifications, Information delivery strategy.

**Unit II**

Architecture and Infrastructure: Concept of data warehouse architecture, operational infrastructure, physical infrastructure, hardware and operating systems, database software, tools. The role of metadata, metadata types, metadata requirements. Principles of dimensional modeling: Dimensional modeling basics, Use of CASE tools, The STAR schema, The Snowflake Schema.

**Unit III**

Data Extraction, Data Transformation, Data Loading. Data Quality: Need, Data Quality Challenges, Data Quality Tools. Information access and delivery, Information delivery tools. Online Analytical Processing (OLAP): Features, functions, OLAP models, Implementation considerations, OLAP platforms, OLAP tools and products.

**Unit IV**

Introduction to Data Mining: definitions, Data mining techniques, applications. Physical Design in data warehouse: Steps, Physical Design considerations, Physical storage. RAID technology, estimating storage sizes, Indexing the data warehouse: B-Tree Index, Bitmapmed Index, Clustered Index Performance Enhancement Techniques: Data Partitioning, Data Clustering, Parallel processing, data arrays. Data warehouse deployment.

**Text Book:**

Paulraj Pooniah , “ Data Warehousing Fundamentals “ Wiley

**Reference:**

Alex Berson , Stephen J. Smith “ Data Warehousing , Data Mining and OLAP , Tata McGraw Hill , 2004 Tenth reprint 2007.

Sam Anahory , Dennis Murray ,” Data Warehousing in the real world “ , Pearson Education

**Course No: IT16302CR**  
**Course Title: Dot NET Technologies**

**UNIT I**

HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of front size & Attributes List types and its tags, Use of Frames and Forms in web pages

Introduction to .NET Framework, .NET Architecture, CIL and JIT, Assemblies, Managed Code, Garbage Collection, MSIL and Metadata, CLR, CLI, CLS.

**UNIT II**

**VB.NET Concepts:** Flow Control, Type Conversions, Complex Variable Types, Arrays, Structs, String Manipulation. Functions, Debugging and Error Handling. Object Oriented Programming using C#, Collections, Comparisons and Conversions. Generics.

**UNIT III:**

**Basic Windows Programming:** Controls, Button, Label and Link Label, Text Box, Radio and Checkbox, RichTextBox, List and CheckBoxes, TreeView and ListView Controls, Tab Control. Menus and ToolBars, SDI and MDI Applications.

**UNIT IV**

**ASP.NET Web Programming:** Site Management (Client and Server Side), Styles, Master Pages, Site Navigation, Authentication and Authorization, Web Service. **Data Access:** Streams, XML, Connection and Command Objects, Data Reader, Data Adapter, Data Set.

**Text Book :** Professional VB.NET 2010 by Christian Nagel , Bill Evgen , Jay Glynn Wrox Publications , 2006.

**Reference**

1. Dietel&Dietel , “VB.NET , How to Program”,Pearson Education.
2. Visual Basic.Net by John Sharp & John Jagger, PHI, New Delhi.
3. Visual Studio .Net by Francisco, Microsoft Publication.

## **Course Code: IT16303CR**

### **Computer Networks**

#### **Unit I**

Goals and applications of networks. LAN, MAN & WAN architectures. Concept of WAN subnet. Overview of existing networks. OSI Reference Model Architecture, TCP/IP Model and their comparison.

#### **UNIT II**

Review on Computer Networks Basis Data Link control: Line discipline, Flow and error control protocols, Physical addressing, HDLC MAC Protocols: Dynamic channel allocation, Random access and Controlled access techniques, IEEE Standards.

#### **UNIT III**

LAN Interconnection technologies and High Speed LANs, Virtual LANs. Virtual Circuit approach in WANs. IP address – Classful IP Addressing, subnetting, NAT, IP datagrams address mapping, error reporting and multicasting in network layer,

#### **UNIT IV**

Static and Adaptive routing, Distance vector and Link-State routing, Broadcast routing, Unicast routing protocols: interior and exterior routing protocol. RIP, OSPF and BGP, Internet control protocols: ICMP, Multicast routing protocols – Source-Based tree and Group-Shared tree approach.

#### **Reference Books:**

1. Andrew Tanenbaum, "Computer Networks", 4th Edition by Pearson.
2. Douglas Comer, "Internetworking with TCP/IP, Volume 1", Pearson.
3. W. Richard Stevens, "UNIX Network Programming", Pearson.
4. Maufer, "IP Fundamentals", Pearson.
5. Douglas Comer, "Client-Server Programming with TCP/IP, Volume 3", Pearson.

**Course Code: IT16304DCE**  
**Course Title: Software Engineering**

**Unit I**

Introduction: Software engineering, Evolving role of software, Concept of software, Changing nature of software, Software Myths, Software Importance, Characteristics, Software Components, Software crises, Software Engineering Challenges (Scale, Quality Productivity, Consistency and Repeatability, Change), Software standard, Software Engineering approach.

**Unit II**

Software Process Management: Software process, phase's framework, capability maturity model integration (CMMI), Process patterns, process assessment, personal and team process models (PSP, TSP) process technology, characteristics of software process. Introduction to software process models waterfall, incremental process models, Evolutionary process model. Process Planning, Estimation, COCOMO Model, Project Scheduling and staffing Risk management (concepts, Risk assessment, and Risk control)

**Unit III**

Introduction to Software Requirement Analysis and Specification: software requirement, (need for SRS requirement process), problem analysis (informal approach, data flow modeling, object –Oriented modeling, prototyping), requirement specification (characteristics, components), Concept of Use Cases, Concept of validation.

**Unit IV**

Design Engineering: Function oriented design, Design principles, Coupling and Cohesion, Design Notations & Specifications, Structured Design Methodology; Object-Oriented Design, OO Concepts, Design Concepts, Design Methodology (Dynamic & Functional Modeling), Design Verification.

CASE (Computer Aided Software Engineering): Concept, scope, CASE Support in Software Life Cycle, Documentation, Project management.

**References:**

1. ROGER S. PRESSMAN - Software Engineering - A Practitioner's Approach, Sixth edition,
2. Pankaj Jalote - An Integrated approach to Software Engineering, 3rd edition, Narosa Publication.
3. Sommerville - Software Engineering. Pearson , 7/e , 2006. SCHAUM'S Outlines, TMH.
4. JAMES F. PETERS Software

**Course Code: IT16305DCE**

**Course Title: Design and Analysis of Algorithms**

**Unit I**

Introduction to Algorithms, Analysis of algorithms, Designing Algorithms, Growth of Functions, Asymptotic notations, Recurrences , Substitution method , Iteration method, Recursion trees , The Master Method, Time and Space Complexity study of some basic algorithms.

**Unit II**

Randomized Algorithms: Identifying the repeated element, Primality testing, Advantages and Disadvantages. Divide and Conquer, General method, Binary search, Quick sort. Greedy Method, General method, Knapsack problem, Single source shortest paths.

**Unit III**

Dynamic programming, General methods, All pair shortest paths, Traveling salesman problems. Backtracking, General method, 8-Queen problem, Sum of subsets, Knapsack problem. Branch and Bound, General method, Least Cost Branch and Bound, 8-Queen Problem, Traveling salesperson problem.

**Unit IV**

Lower boundary theory, Lower bound theory through reductions, P and NP problems. NP hard and NP complete problems. Approximate Algorithms and their need, The vertex Cover Problem, The traveling salesman problem, The subset sum problem.

**Text Book:**

2. Pearson Horowitz, Sahni, “ Fundamentals of Computer Algorithms”, Galgotia Publications
3. Goodrich and Tamassia “ Algorithm design”

**Reference Books:**

1. Cormen, Leiserson, Rivest, Stein, “Introduction to Algorithms”, 2nd edition, PHI.
2. Aho, Hopcroft and Ullman, “The Design and Analysis of Computer Algorithms”, Pearson.

**Course Code: IT16306GE**  
**Course Title: Multimedia Systems**

**UNIT I**

Introduction to multimedia, Definition, Elements of multimedia, Need of multimedia, Applications, Goal & Objectives, Users of multimedia, Benefits of Multimedia, Training, Sales, Communication, Medicine. Multimedia & Internet. Multimedia Configuration: Converging technologies, Functions & subsystems (input, development & output). Multimedia PC workstation components. Multimedia platform, Multimedia H/w, System software, Multimedia OS File system(tiff, bmp, pcx, gif, jpeg etc.)Multimedia communication system. Development Tools: Developing applications, commercial tools, standards. Image and application image capture, Compression, text conversion, vaporization, image compression, Standards for encoding images, Standards for compression bitonal images, JPEG, Fractals for compression.

**UNIT-II**

Multimedia Graphics: 2D/3D animation fundamentals, color modules digital, imaging, still and moving images, Video application, video capture, animation video, processing, video recovery techniques, Creating videos on the desktop, Television(Broadcast TV, HDTV), Compression standards, AVI file formats, NTSC,PAL, video/audio conferencing techniques and standards.

**UNIT-III**

Multimedia Audio: Basic sound concepts, audio, capture, music, speech, sound processor, sound recovery technique, VOC and WAV file formats for sound. Compression standards (Audiovisual telephony & application)Multimedia Devices: Mass storage systems for multimedia requirements, Magnetic devices, Optical devices, CD-ROM, DVD, scanners, types & specifications.

**UNIT-IV:**

Multimedia in Real World: Multimedia on network, Multimedia databases(in Oracle), Windows support for sound, animation, movies, music. Training & education: need for training, multimedia in training and education. Multimedia for information and sales, Multimedia in office & home. Impact of Multimedia – Developing Applications: Introduction, Methodology, design. Multimedia objects, different kinds of object, object technology, Sharing multimedia, working in groups, workflow management, collaborative computing.

**References:**

1. Multimedia in Practice – Judith Jeffcote (PHI)
2. Multimedia Computing, Communication & Applications – Ralf Steinmetz,KlaraNahrstedt (PH-PTR Innovative technology series)
3. Multimedia, Production, Planning & Delivery – John Villamil, Casanova(PHI)
4. Virtual Reality and Multimedia – Durano R. Begault (AP professionals)
5. Principles of Interactive Multimedia – Elsom, Cook (TMH)

**Course Code: IT16307GE**  
**Course Title: Management Information systems**

**Unit I**

Organisation and Information Systems , Changing Environment and its impact on Business - The IT/IS and its influence - The Organisation: Structure, Managers and activities - Data, information and its attributes - The level of people and their information needs - Types of Decisions and information - Information System, categorisation of information on the basis of nature and characteristics. , Transaction Processing System (TPS) - Office Automation System (OAS) - Management Information System (MIS) - Decision Support System (DSS) and Group Decision Support System (GDSS) - Expert System (ES) - Executive Support System (EIS or ESS).

**Unit II**

Need for System Analysis - Stages in System Analysis - Structured SAD and tools like DFD, Context Diagram Decision Table and Structured Diagram. System Development Models: Water Flow, Prototype, Spiral, RAD – Roles and responsibilities of System Analyst, Database Administrator and Database Designer. Information systems for Accounting, Finance, Production and Manufacturing, Marketing and HRM functions - IS in hospital, hotel, bank

**Unit III**

Enterprise Resources Planning (ERP): Features, selection criteria, merits, issues and challenges in Implementation - Supply Chain Management (SCM): Features, Modules in SCM - Customer Relationship Management (CRM): Phases. Knowledge Management and e-governance ,Nature of IT decision - Strategic decision - Configuration design and evaluation Information technology implementation plan.

**Unit IV**

Security and Ethical Challenges , Ethical responsibilities of Business Professionals – Business, technology, Computer crime – Hacking, cyber theft, unauthorized use at work. Piracy – software and intellectual property. Privacy – Issues and the Internet Privacy. Challenges – working condition, individuals. Health and Social Issues, Ergonomics and cyber terrorism.

**RECOMMENDED BOOKS:**

1. “Management Information Systems”, Kenneth J Laudon, Jane P. Laudon, Pearson/PHI,10/e, 2007
2. “Management Information Systems”, W. S. Jawadekar, Tata McGraw Hill Edition, 3/e, 2004
3. Turban, Efraim, Ephraim McLean, and James Wetherbe. 2007. Information Technology for Management: Transforming Organizations in the Digital Economy. New York, John Wiley & Sons.



**Course Code: IT163080E**

**Course Title: Fundamentals of Grid and Cloud Computing**

### **UNIT I**

**FUNDAMENTALS OF GRID COMPUTING** The Grid – Past, Present and Future – Applications of Grid Computing Organizations and their Roles.

**GRID COMPUTING ARCHITECTURE** Grid Computing Anatomy – Next Generation of Grid Computing Initiatives – Merging the Grid Services Architecture with Web Services Architecture.

### **UNIT II**

**GRID COMPUTING TECHNOLOGIES**

OGSA – Sample Use Cases that drive OGSA Platform Components – OGSI and WSRF – OGSA Basic Services – Security Standards for Grid Computing – High Level Grid Services.

### **UNIT III**

**FUNDAMENTALS OF CLOUD COMPUTING**

Fundamentals – Short history of cloud computing – Cloud Architecture – Cloud Storage – Cloud Service – Pros and Cons of cloud computing – Benefits from cloud computing.

### **UNIT IV**

**CLOUD SERVICES**

Need for Web-Based Application – The cloud Service Development – Cloud Service, Development Types – Cloud Service development tools.

### **TEXT BOOKS**

1. Joshy Joseph & Craig Fellenstein, “Grid Computing”, Pearson Education, 2004.
2. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que, 2008.

### **REFERENCES**

1. Fran Berman, Geoffrey Fox, J.G. Anthony Hey, “Grid Computing : Making the Global Infrastructure a reality”, John Wiley & sons, 2003.
2. Hmar Abbas, “Grid Computing: A Practical Guide to technology and Application Charles River media, 2003.

**Course Code: IT16309OE**  
**Course Title: Discrete Mathematics**

**UNIT I**

Proposition, Logic, Truth tables, Propositional Equivalence, Logical Equivalence, Predicates and Quantifiers, Sets: operations on sets, Computer representation of sets, Functions: Domain, Range, One-to-One, Onto, Inverses and Composition, Cardinality of a Set, sequences and summations, The growth of functions . Methods of Proof: Different methods of proof, Direct Proof, Indirect Proof, Mathematical Induction for proving algorithms.

**UNIT II**

Counting: Basic Counting Principle, The Pigeon-Hole Principle, Permutation, combinations, repetitions, discrete probability, Advanced Counting Techniques: Inclusion-Exclusion, Applications of inclusion-exclusion principle, recurrence relations, solving recurrence relation. Relations: Relations and their properties, Binary Relations, Equivalence relations, Diagraphs, Matrix representation of relations and digraphs, Computer representation of relations and digraphs, Transitive Closures, Warshall's Algorithm.

**UNIT III**

Partially Ordered Sets (Posets), External elements of partially ordered sets, Hasse diagram of partially ordered set, isomorphic ordered set ,Lattices: Properties of Lattices, complemented Lattices. Graph theory: Introduction to graphs, Graph Terminology Weighted graphs, Representing Graphs, Connectivity of Graphs: Paths and Circuits, Eulerian and Hamiltonian Paths, Matrix representation of graphs. Graph Coloring.

**UNIT IV**

Trees: Rooted trees, Application of trees: Binary Search Trees, Decision Trees, Prefix Codes, Tree traversal, trees and sorting, spanning trees, minimal spanning trees. Finite Boolean algebra, Functions on Boolean algebra, Boolean functions as Boolean polynomials. Groups and applications: Subgroups, Semigroups, Monoids, Product and quotients of algebraic structures, Isomorphism, Homomorphism,

**Text Book :**

KENNETH H. ROSEN "Discrete Mathematics and Its Applications" The Random House/Birkhauser Mathematics series

**Reference Books:**

1. LIU "Elements of Discrete Mathematics " Tata McGraw Hill
2. SCHAUMS "Discrete Mathematics " Tata McGraw Hill
3. KOLMAN/REHMAN "Discrete Mathematical Structures " Pearson Education
4. NICODEMI "Discrete Mathematics " CBS