

**ANNA UNIVERSITY CHENNAI**

**CHENNAI – 600 025**

**M.Sc. INFORMATION TECHNOLOGY (DISTANCE MODE)**

**REGULATIONS - 2009**

**CURRICULUM**

**I SEMESTER**

**Theory**

<b>Code No.</b>	<b>Course</b>	<b>Title Marks</b>
<b>DIT 111</b>	Probability and Queuing Theory	100
<b>DSE 112</b>	Software Engineering	100
<b>DIT 113</b>	High Speed Networks	100
<b>DCS 114</b>	Database Management Systems	100
<b>DCS 115</b>	Object Oriented Programming	100
<b>DIT 116</b>	Network Protocols	100

**Practical**

<b>DIT 117</b>	Object Oriented Programming Lab	100
<b>DCS 118</b>	RDBMS Lab	100

**II SEMESTER**

**Theory**

<b>Code No.</b>	<b>Course</b>	<b>Title Marks</b>
<b>DCS 121</b>	Mobile Computing	100
<b>DSE 232</b>	Software Project Management	100
<b>DIT 123</b>	Digital Signal Processing	100
<b>DCS 124</b>	Object Oriented Analysis and Design	100
<b>DIT 125</b>	Visual Programming	100
	Elective I	100
	Elective II	100

**Practical**

<b>DIT 126</b>	Visual Programming Lab	100
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**III SEMESTER**

<b>Theory</b>	<b>Code No. Course</b>	<b>Title Marks</b>
<b>DIT 231</b>	Network Administration	100
<b>DIT 232</b>	Graphics and Multimedia Systems	100
<b>DIT 233</b>	Network Security	100
<b>DIT 234</b>	Web Technology	100
	Elective III	100
	Elective IV	100
<b>Practical</b>		
<b>DCS 235</b>	Case Tools and UML Lab	100
<b>DIT 236</b>	Web Technology Lab	100

**IV SEMESTER**

<b>Practical</b>		
<b>DIT 241</b>	Project Work	400
	<b>Total Marks :</b>	<b>2800</b>

**LIST OF ELECTIVES****ENTERPRISE COMPUTING SERVICE TECHNOLOGY**

<b>Code No.</b>	<b>Course Title</b>	<b>Marks</b>
<b>DIT 001</b>	XML and Web Service	100
<b>DIT 002</b>	Client Server Computing	100
<b>DIT 004</b>	Supply Chain Management	100
<b>DIT 005</b>	E-Commerce	100

**ENTERPRISE ANALYTICAL SERVICE TECHNOLOGY**

<b>Code No.</b>	<b>Course Title</b>	<b>Marks</b>
<b>DCS 008</b>	Data Mining and Data Warehousing	100
<b>DCS 231</b>	Design and Analysis of Algorithms	100
<b>DSE 004</b>	Extreme programming	100

**ADVANCED SECURE COMMUNICATION**

<b>Code No.</b>	<b>Course Title</b>	<b>Marks</b>
<b>DCS 232</b>	Cryptography and Data Security	100
<b>DIT 003</b>	Satellite Communication	100

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**M.Sc. INFORMATION TECHNOLOGY (DISTANCE MODE)**

**REGULATIONS – 2009**

**SYLLABUS**

**I SEMESTER**

**DIT 111      PROBABILITY AND QUEUING THEORY**

**UNIT I**      Probability and Random Variables: Probability concepts – Random variables – Moment generating function – Binomial, Poisson, Geometric, Uniform exponential, Normal distributions – Functions of Random variables.

**UNIT II**      Two-Dimensional Random Variables: Marginal and conditional distributions – Covariance – correlation and Regression – Transformation of Random Variables.

**UNIT III**      Tests of Hypothesis: Sampling distributions – Tests based on Normal, t and F distributions for means, variance and proportions, chi-square test for variance, independence and goodness of fit.

**UNIT IV**      Random Process: Classification – stationary process – Markov process – Poisson process – Markov chains.

**UNIT V**      Queueing Theory: Single and multi-server Markovian Queues – Stationary for queue size distributions – Little's formula – Average measures.

**TEXT BOOK**

1. T.Veerarajan, "Probability, Statistics and Random Process, Tata McGraw Hill, 2002.

**REFERENCES**

1. Taha, H.A. "Operations Research : An Introduction", Prentice Hall, New Delhi, 2002.
2. P. Kandasamy, K. Thilagavathi and K. Gunavathi, "Probability, Random Variables and Random Processors", S. Chand, 2003.

**DSE 112 SOFTWARE ENGINEERING**

- UNIT I** Introduction – The Software problem – Software Engineering Problem – Software Engineering Approach – Summary – Software Processes – Characteristics of a Software Process – Software Development Process – Project Management Process – Software Configuration Management Process – Process Management Process – Summary.
- UNIT II** Software Requirements Analysis and Specification – Software Requirements – Problem Analysis – Requirements Specification – Validation – Metrics – Summary.
- UNIT III** Planning a Software Project – Cost Estimation – Project Scheduling – Staffing and Personnel Planning – Software configuration Management Plans – Quality Assurance Plans – Project Monitoring Plans – Risk Management – Summary.
- UNIT IV** Function-oriented Design – Design Principles – Module-Level Concepts – Design Notation and Specification – Structured Design – Methodology – Verification – Metrics – Summary. Detailed Design – Module specifications – Detailed Design – Verification – Metrics – Summary.
- UNIT V** Coding – Programming Practice – Top-down and Bottom-up - structured programming – Information Hiding – Programming style – Internal Documentation Verification – Code Reading – Static Analysis – Symbolic Execution – Code Inspection or Reviews – Unit Testing – Metrics – Summary Testing – Fundamentals – Functional Testing versus structural Testing – Metrics – Reliability Estimation – Basic concepts and Definitions – Summary.

**TEXT BOOK**

1. Pankaj Jalote, “An Integrated Approach to Software Engineering”, Narosa Publishing House, Delhi, 2000.

**REFERENCES**

1. Pressman R.S., “Software Engineering”, Tata McGraw Hill Pub. Co., Delhi, 2000.
2. Sommerville, “Software Engineering”, Pearson Education, Delhi, 2000.

**DIT 113      HIGH SPEED NETWORKS**

**UNIT I**      High speed Networks: Fast Ethernet technology, FDDI, SONET and SDh standards, Performance of HIGH speed LAN- throughput, delay and reliability. Wave length division multiplexed LAN-routing and switching MDM networks, Gigabit LAN.

**UNIT II**      ISDN and Standards: Overview of ISDN – user interface, architecture and standards. Packet switched call over ISDN, B and D channels, link access procedure (LAPD) ISDN layered architecture, signaling. Limitations of Narrowband ISDN (N-ISDN) and evolution of broad band ISDN (B-ISDN).

**UNIT III**      Asynchronous Transfer Mode Networks: ATM protocol architecture, ATM adaption layer, fast packet switching techniques and VP/VC encapsulation. ATM cells, ATM cell header interpretation, source characteristics.

**UNIT IV**      ATM Traffic Management: Traffic management issues in ATM-resource management, connection management, policing and reactive control principles. Discrete time queue analysis and application to CAC, leaky bucket and ECN/ICN.

**UNIT V**      ATM signaling and Data communication over ATM: ATM signaling fundamentals and meta-signaling. TCP/IP over ATM-challengers and proposal LAN emulation over ATM. Performance of Data Communication over ATM.

**TEXT BOOKS**

1. Onvural.R.O., “Asynchronous Transfer Mode Networks”, Performance Issues, Artech House, 1995.
2. Stallings.W., “High Speed Networks, TCP-IP and ATM design Principles”, Prentice Hall of India, Delhi, 1998.

**REFERENCES**

1. Craig Patridge, “Gigaabit Networking”, Addison Wesley, 1997.
2. Stallings W, “ISDN with frame relay and ATM”, P.H.International, 1995.

**DCS 114      DATABASE MANAGEMENT SYSTEMS**

- UNIT I**      Introduction: File systems versus Database systems – Data Models – DBMS Architecture – Data Independence – Data Modeling using Entity – Relationship Model – Enhanced E-R Modeling.
- UNIT II**      Storage Structures: Secondary storage Devices – RAID Technology – File operations – Hashing Techniques – Indexing – Single level and Multi-level Indexes – B+ tree Indexes on Multiple Keys.
- UNIT III**      Relational Model: Relational Model Concepts – Relational Algebra – SQL – Basic Queries – Complex SQL Queries – Views – Constraints – Relational Calculus – Tuple Relational Calculus – Domain Relational Calculus – overview of commercial RDBMSs – Database Design – Functional Dependencies – Normal Forms – 1NF – 2NF-3NF-BCNF – 4NF-5NF – Database Tuning.
- UNIT IV**      Query and Transaction Processing: Algorithms for Executing Query Operations – using Heuristics in Query operations – Cost Estimation – Semantic Query Optimization – Transaction Processing – Properties of Transactions - Serializability – Transaction support in SQL.
- UNIT V**      Concurrency, Recovery and Security: Locking Techniques – Time Stamp ordering – Validation Techniques – Granularity of Data Items – Recovery concepts – Shadow paging – Log Based Recovery – Database Security Issues – Access control – Statistical Database Security.

**TEXT BOOK**

1. Ramez Elamassri and Shankant B-Navathe, “Fundamentals of Database Systems”, Third Edition, Pearson Education, Delhi, 2002.

**REFERENCES**

1. Abraham Silberschatz, Henry F.Korth and S.Sundarshan “Database System Concepts”, Fourth Edition, McGraw Hill, 2002.
2. C.J. Date, “An Introduction to Database Systems”, Seventh Edition, Pearson Education, Delhi, 2002.

**DCS 115      OBJECT ORIENTED PROGRAMMING**

**UNIT I**      C++ Programming: Introduction to C++ - Tokens, expressions and control structures – Functions in C++ - Classes and Objects – Constructors – Destructors – Operator Overloading and Type conversions.

**UNIT II**      Inheritance and Polymorphism and Files: Inheritance – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance – Virtual base class – Abstract class – Virtual functions – pure virtual functions – File stream operations – Sequential Input and Output operations – Random Access – Error handling during file operation.

**UNIT III**      Templates and Exception Handling: Templates – Function templates – class Templates – Overloading of Template Functions – Member function Templates – Exception handling – basics – Exception handling mechanism – Throwing mechanism catching mechanism – Rethrowing an exception – specifying exceptions.

**UNIT IV**      Introduction to JAVA: Overview of Java language – Implementing a Java Program – Java virtual Machine – Operators and expressions – Classes, Objects and methods – Constructors – Overriding methods – Final class – Finalizer methods – Abstract classes and methods – Visibility controls – Arrays – Strings and vectors.

**UNIT V**      Interfaces, Packages and Threads: Interface – Extending Interface – Implementation Interfaces – Accessing Interface variables – Java API packages – creating packages – Accessing and using packages – Adding and Hiding classes – creating threads – Extending the Thread class – Stopping and Blocking a Thread – Life cycle of a thread – Thread priority – Synchronization.

**TEXT BOOKS**

1. E. Balagurusamy, “Object Oriented Programming”, 2<sup>nd</sup> Edition, Tata McGraw Hill Pub. Co., Delhi, 2001.
2. E. Balagurusamy, “Programming with Java, A Primer”, Tata McGraw Hill Pub. Co., Delhi, 2000.

**REFERENCES**

1. Herbert Schildt, “C++ : The Complete Reference”, Tata McGraw Hill, 1999.
2. Herbert Schildt, “Java 2 : The Complete Reference”, Fourth Edition, Tata McGraw Hill, 2001.
3. Kamthane, A.N., “Object Oriented Programming with ANSI and Turbo C++, Pearson Education, Delhi, 2003

**DIT 116      NETWORK PROTOCOLS**

- UNIT I**      Internet Protocol : Routing IP Datagrams – Error and Control Messages (ICMP), Reliable Stream Transport Service (TCP) : TCP State Machine, Response to congestion – congestion, Tail Drop and TCP – Random Early Discard, Routing : Exterior Gateway Protocols and Autonomous Systems (BGP)
- UNIT II**      Internet Multicasting – Mobile IP – Bootstrap And Auto configuration (BOOTP, DHCP).
- UNIT III**      The Domain Name System (DNS) – Applications : Remote Login (TELNET, Rlogin) – File Transfer and Access (FTP, TFTP, NFS).
- UNIT IV**      Applications : Electronic Mail (SMTP, POP, IMAP, MIME) – World Wide Web (HTTP) – Voice and Video over IP (RTP).
- UNIT V**      Applications : Internet Management (SNMP) – Internet Security and Firewall Design (Ipsec) – The Future of TCP / IP (IPV6).

**TEXT BOOK**

1. Douglas E.Comer, “Internetworking with TCP / IP – Principles, Protocols and Architectures, Fourth Edition, Prentice – Hall of India Private Limited, 2002.

**REFERENCES**

1. Uyles Black, ‘Computer Networks – Protocols, Standards and Interfaces’, Second Edition, Prentice Hall of India, Delhi, 2002.
2. Udupa, “Network Management System essentials”, McGraw Hill, 1999.

## **PRACTICALS**

### **DIT 117      OBJECT ORIENTED PROGRAMMING LAB**

1. Create a complex number class with all possible operators
2. Create a vector class
3. Create a string class
4. Create a time class
5. Create a data class
6. Create a matrix class
7. Create an employee class with derived classes
8. Create Lists

### **DCS 118      RDBMS LAB**

1. Data Definition, Manipulation of base Tables and views.
2. High level programming language extensions.
3. Front and tools.
4. Forms – Triggers – Menu Design.
5. Reports.

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**II SEMESTER****DCS 121      MOBILE COMPUTING**

- UNIT I**      Introduction: Mobile and Wireless Devices – Simplified Reference Model – Need for Mobile Computing – Wireless Transmissions – Multiplexing – Spread Spectrum and Cellular Systems – Medium Access Control – Comparisons.
- UNIT II**      Telecommunication Systems – GSM – Architecture – Sessions – Protocols – Hand Over and Security – UMTS and IMT-2000 – Satellite Systems.
- UNIT III**      Wireless LAN: IEEE S02.11 – Hiper LAN – Bluetooth – MAC layer – Security and Link Management.
- UNIT IV**      Mobile IP: Goals – Packet Delivery – Strategies – Registration – Tunneling and Reverse Tunneling – Adhoc Networks – Routing Strategies.
- UNIT V**      Wireless Application Protocol (WAP) – Architecture – XML – WML Script – Applications.

**TEXT BOOK**

1. Jochen Schiller, “Mobile Communications”, Pearson Education, Delhi, 2000.

**REFERENCE**

1. Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Danil Mounney, Jari Alvinen, David Bevis, Jim Chan and Stetan Hild, “The Wireless Application Protocol : Writing Applications for the Mobile Internet”, Pearson Education, Delhi, 2001.

**DSE 232 SOFTWARE PROJECT MANAGEMENT**

**UNIT I** Introduction – Product Life – Project life cycle models - water fall model – Prototyping model – RAD model – Spiral Model – Process Models – Matrics.

**UNIT II** Software Configuration Management – Definitions and terminology – processes and activities – Configuration audit – Matrics – Software Quality assurance – definitions – quality control and assurance – SQA Tools – Organisation of Structures - Risk Management – Risk Identification, quantification Monitoring – Mitigation.

**UNIT III** Project initiation – Project Planning and tracking – what, cost, when and how – organisational processes – assigning resources – project tracking – project closure – when and how.

**UNIT IV** Software requirements gathering – steps to be followed – skills sets required – challenges – matrics – Estimation 3 phases of estimation – formal models for size estimation – translating size estimate to effort schedule estimate, matrics – Design and Development phases – reusability, Technology choices, Standards, Portability user interface – testability – diagnosability etc.

**UNIT V** Project Management in testing phase – in the maintenance phase – Impact on internet on project Management.

**TEXT BOOK**

1. Gopaldaswamy Ramesh, “Managing Globle Software Projects” Tata McGraw Hill Publishing Company Ltd, New Delhi, 2002

**REFERENCE**

1. Bob Hughes and Mike Cotterell “Software Project Management” 2<sup>nd</sup> edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.

**DIT 123      DIGITAL SIGNAL PROCESSING**

- UNIT I**      Discrete Time signals and Systems: Discrete time signals – Operation on sequences – sampling of continuous time signals – aliasing – Discrete time systems – Time domain characterization of discrete time systems – state space representation – Discrete random signals – Mean, variance, covariance and power spectral density.
- UNIT II**      Frequency Domain analysis: Discrete Time Fourier Transform (DTFT) – Discrete Fourier Transform (DFT) – Computation of DFT using FFT algorithms – DIT – FFT and DIF FFT – Linear convolution using FFT – Z-Transform and inverse Z-Transform – Frequency response of discrete time systems.
- UNIT III**      Digital Filters: Butterworth, Chebyshev, Elliptic approximations for filters – design of IIR low pass and high pass filters using impulse invariance and bilinear Z-transform – Principles of frequency transform – FIR digital filters – design of ideal low pass and high pass FIR digital filters – design of ideal low pass and high pass FIR filter design using Hamming, Hanning and Blackman windows – Linear phase condition.
- UNIT IV**      Digital Filter Structures: Block diagram representation – signal Flow graph representation – Basic FIR Digital filter Structures – transversal and poly phase – Direct form I, Direct form II, cascade and parallel structures for IIR filters.
- UNIT V**      Algorithm Implementation and Finite word Length Effects: Number representation – Fixed point and Floating point – Quantization error analysis – overflow error – truncation error – coefficient quantisation error – Limit cycle oscillations – Dynamic range scaling – Round off errors in FFT algorithms.

**TEXT BOOK**

1. Digital Signal Processing – Sanjit K. Mitra, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1998.

**REFERENCE**

1. Discrete-Time Signal Processing – Alan V. Oppenheim, Ronald W. Schaffer, Prentice Hall of India, New Delhi, 1992.

**DCS 124      OBJECT ORIENTED ANALYSIS AND DESIGN**

- UNIT I**      Object Basis: Object Oriented Philosophy – Object – Object State, behaviors and methods. Encapsulation and information hiding Class Relationship among classes polymorphism, aggregation, object containment, meta classes.
- UNIT II**      Object Oriented Methodologies: Rumbaugh object Model, Booch methodology Jacobson methodology, patterns, frame works and unified approach.
- UNIT III**      Object Oriented Analysis: Business object analysis use case driven approach – use case model. Object analysis – CRC cards – Noun phrase approach Identifying object relationships and methods.
- UNIT IV**      Object Oriented Design: On design process – Design axioms – design patterns – designing classes. Case study.
- UNIT V**      UML and Programming: Introduction to unified modeling language – UML diagrams – class diagrams and use case diagrams – State and dynamic models. Case study to inventory, sales and banking.

**TEXT BOOK**

1. Ali Bahrami, “Object Oriented Systems Development” Irwin-McGraw Hill, New Delhi, International editions, 1999.

**REFERENCES**

1. Martin Fowler, Kendall Scott, “UML Distilled-Applying the standard Object Modeling Language”, Addition Wesley 1977.
2. Gredy Booch, “Object Oriented Analysis and Design with applications”, II edition, Addition Wesley, 1994.

**DIT 125 VISUAL PROGRAMMING**

- UNIT I** Introduction to Windows Programming – Event Driven Programming – Data Types – Resources – Window Message – Device Context – Document Interfaces – Dynamic Linking Libraries – Software Development Kit (SDK) Tools – Context Help.
- UNIT II** Visual Basic Programming – Forum Design – VBX Controls – Properties – Event Procedures – Menus and Toolbars – Using Dialog Boxes – Working with Control Arrays – Active X Controls – Multiple Documents Interface (MDI) – File System Controls – Data Control – Database Applications.
- UNIT III** Visual C++ Programming – Frame Work Classes – VC++ Components – Resources – Event Handling – Message Dispatch System – Model and Modeless Dialogs – Important VBX Controls – Document view Architecture – Serialization – Multiple Document Interface – Splitter Windows – Coordination Between Controls.
- UNIT IV** Database Connectivity – Min Database Applications – Embedding Controls in View – Creating user defined DLL's – Dialog Based Applications – Dynamic Data Transfer Functions – Data Base Management with ODBC – Communicating with other applications – Object Linking and Embedding.
- UNIT V** Basics of GUI Design – Visual Interface Design – File System – Storage and Retrieval System – Simultaneous Multi Platform Development.

**TEXT BOOKS**

1. Petzold, "Windows Programming", Microsoft Press, 1995.
2. Marion Cottingham, "Visual Basic", Peachpit Press, 1999.
3. Kate Gregory, "Using Visual C++", Prentice Hall of India Pvt. Ltd. 199.

**REFERENCES**

1. Pappas and Murray, "Visual C++ : The Complete Reference", Tata McGraw Hill, 2000.
2. Brian Siler and Jeff Spotts, "Using Visual Basic 6", Prentice Hall India, 2002.

## PRACTICALS

### DIT 126 VISUAL PROGRAMMING LAB

1. Building Simple Applications.
2. Working with Intrinsic Control and ActiveX Controls.
3. Application with multiple forms.
4. Application with Dialogs.
5. Application with Menus.
6. Application with Data Controls.
7. Application using Common Dialogs.
8. Drag and Drop Events.
9. Database Management.
10. Creating ActiveX Controls

### III SEMESTER

#### DIT 231 NETWORK ADMINISTRATION

- UNIT I** Network services – Names and Addresses – The Host Table – DNS – Mail services – File and Print servers – configuration servers – summary - Getting started – connected and Non-connected Networks – Basic information – planning Routing – Planning Naming Service – Other services – Informing the Users – summary - Basic Configuration - Kernel – configuration – Using Dynamically Loadable Modules – Recompiling the Kernel – Linux Kernel configuration – Startup Files – The Internet Daemon – The Extended Internet Daemon.
- UNIT II** Configuring the Interface – The ifconfig command – TCP / IP over a Serial Line – Installing PPP - Configuring Routing – common routing configuration – The minimal routing table – Building a static routing table – configuring DNS – BIND : Unix name service – configuring the Resolver – configuring named – using ns lookup
- UNIT III** Local Network Services – the Network File system – Sharing Unix printers – using samba to share resources with windows – Network Information – service – DHCP – Managing Distributed servers – Post office servers – send mail – sendmail’s function – running sendmail as a Daemon – Sendmail Aliases – Modifying a sendmail of File – Testing Sendmail.
- UNIT IV** Configuring Apache – Installing Apache software – configuring the Apache server – understanding an Lhttpd. Conf File – Web server security - Managing your web server – Network Security – Security planning – user Authentication – Application security – Security Monitoring – Access control – Encryption – Firewalls.
- UNIT V** Trouble shooting TCP / IP Applications a problem – Diagnostic Tools – Testing Basic connectivity – Troubleshooting Network Access – Checking Routing – Checking Name Service – Analyzing Protocol problems – Protocol case study - Applications : Internet Management – Introduction – The level of Management Protocols – Architectural Model – Protocol Framework – Examples of MIB variables – The structure of Management Information – Formal Definitions using ASN 1 – Structure and Representation of MIB object names – Simple Network Management Protocol – SNMP message format – Example encoded SNMP message – New features in SNMPv3 - Summary.

#### TEXT BOOK

1. Craig Hunt, “TCP / IP Network Administration”, 3<sup>rd</sup> Edition, O’Reilly Networking 2002.
2. Douglas E Comer, “Internetworking with TCP / IP – Principles, Protocols and Architectures”, Fourth Edition, Prentice – Hall of India Pvt. Ltd., 2002.

#### REFERENCES

1. Steven Graham, Steve Shah, “LINUX Administration A beginner’s Guide”, 3<sup>rd</sup> Edition, McGraw Hill, 2002.
2. Nicholas wells, “Guide to Linux Installation and administration”, Vikas Publishing house, 2000.
3. Red Hat, “Official Red Hat Linux 8 Administrator’s Guide”, Wiley – Dreamtech India Pvt. Ltd., 2002.
4. Steve Maxwell, “UNIX system Administration, A beginner’s Guide”, Tata McGraw Hill Edition, 2002.

**DIT 232      GRAPHICS AND MULTIMEDIA SYSTEMS**

**UNIT I**      Introduction: I/O devices – I/O primitives – DDA – Bresenham technique – Circle drawing algorithms – Interactive input methods.

**UNIT II**      2D Graphics: 2D Transformations – Window Viewport mapping – Clipping algorithms polygons – Splines – Bezier curves – Basis.

**UNIT III**      3D Graphics: 3D concepts – Representations – Projections – Hidden surface, line removal Visualization and rendering – Color models – Texture mapping.

**UNIT IV**      Overview of Multimedia: Multimedia Hardware & Software – Components of multimedia – Text, Image –Graphics – Audio – Video – Animation – Authoring – Multimedia Project development.

**UNIT V**      Multimedia Systems and Applications: Multimedia Communication Systems – Database Systems – Synchronization issues – Presentation requirements – Applications – Video conferencing – Virtual reality – Interactive Video – Media on Demand.

**TEXT BOOK**

1. Donald Hearn, M. Pauline Baker, “Computer Graphics – C Version”, second edition, Pearson Education, 2004.

**REFERENCES**

1. Ralf Steinmetz, Klara Steinmetz, “Multimedia Computing, Communications & Applications” Pearson education, 2004.
2. Tay Vaughan, “Multimedia Making It Work”, McGraw Hill, 2002.
3. J. D. Foley, A. VanDam, S. K. Feiner, J. F. Hughes, “Computer Graphics Principles and Practice”, Addison and Wesley Publications, 2002.
4. Drew, “Fundamental Of Multimedia “, Feurun, 2004.

**DIT 233 NETWORK SECURITY**

- UNIT I** Introduction – Primer on a Networking – Active and Passive Attacks – Layers and Cryptography – authorization – Viruses, worms. The Multi level Model of Security – Cryptography – Breaking an Encryption Scheme – Types of Cryptographic functions – secret key Cryptography – Public key Cryptography – Hash algorithms. Secret key cryptography – Data encryption standard – International Data Encryption Algorithm (IDEA) Modes 4 Operations – Encrypting a Large message – Electronic code book, cipher block chaining, OFB, CFB, CTR – Generating MACs – Multiple Encryption DES.
- UNIT II** Introduction to public key algorithms – Model of arithmetic – Modular addition, Multiplication, Exponentiation. RSA – RSA Algorithm – RSA Security – Efficiency of RSA – Public Key cryptography Standard (PKCS) - Digital Signature Standard – DSS Algorithm – Working of Verification procedure – Security and DSS – DSS controversy – Zero Knowledge proof systems.
- UNIT III** Authentication – Overview of authentication systems – password based authentication – Add nets based authentication – cryptographic authentication protocols – who is seeing authenticate – passwords as cryptographic keys – Eaves dropping and server database reading – Trusted intermediaries – Session key establishment. Authentication of people – passwords – online – off line password of using – Eavesdropping – passwords and careless users – Initial Password distribution – Authentication tokens.
- UNIT IV** Standards and IP security – Introduction to Kerberos – Tickets and Ticket granting tickets. Configuration - logging into the network – replicated KDCs. Overview of IP security – security associations – security association database - security policy database, AH and ESP – Tunnel Transport mode why protect - IP Header IPV4 and IPV6, NAT, Firewalls, IPV4, IPV6 Authentication Header – ESP - reason for having Authentication Header.
- UNIT V** Network Security Application – Email Security – distribution lists – store and forward – security services for email – establishing keys privacy – authentication of the source – message Integrity – Non-Repudiation – Proof of submission – Proof of delivery. Message flow confidentially – Anonymity – Names and Addresses. Firewalls – packet filters – application level gateway – encrypted tunnels – comparisons why firewalls don't work – denial of service attacks. Web security – Introduction – URLs/URIs – HTTP – HTTP digest authentication. Cookies – other web security problems.

**TEXT BOOK**

1. Charlie Kaufman, Radia Perlman and Mike Speciner “Network Security : Private Communication in a Public Work”, Second Edition, Pearson Education, 2002.

**REFERENCES**

1. William Stallings, “Network Security : Essentials Applications and Standards”, Pearson Education, 2002.
2. Hans, “Information and Communication Security”, Springer Verlag, 1998.
3. Derek Atkins, “Internet Security”, Tech media, 1998.

**DIT 234      WEB TECHNOLOGY**

**UNIT I**      Internetworking concepts – Devices – Repeaters – Bridges – Routers – Gateways – Internet topology Internal Architecture of an ISP – IP Address – Basics of TCP – Features of TECP – UDP – DNS – Email – FTP – HTTP – TELNET.

**UNIT II**      Electronic commerce and Web technology – Aspects – Types – E-procurement models – Solutions – Supply chain management – Customer Relationship Management – Features Required for enabling e-commerce – Web page – Tiers – Concepts of a Tier – Static Web pages – Dynamic Web pages – DHTML – CGI – Basics of ASP technology – Active Web pages.

**UNIT III**      User Sessions, Transaction Management and Security issues – Sessions and session Management – Maintaining state information – Transaction Processing monitors – object Request Brokers – Component transaction – monitor – Enterprise Java Beans – Security – Basic concepts – cryptography – Digital signature – Digital certificates – Security Socket Layer (SSL) – Credit card Processing Models – Secure Electronic Transaction – 3D Secure Protocol – Electronic money.

**UNIT IV**      Electronic Data Interchange, XML and WAP – Overview of EDI – Data Exchange Standards – EDI Architecture – EDI and the Internet – Basics of XML – XML Parsers – Need for a standard – Limitations of Mobile Devices – WAP Architecture –                      WAP stack.

**UNIT V**      Online Applications and Emerging technologies - Online Shopping – Online databases – Monitoring user events – Need for .NET - Overview of .NET Framework – Web services.

**TEXT BOOK**

1. Achyat.S.Godbole and Atul Kahate, “Web Technologies”, Tata McGraw Hill Pub. Co., Delhi, 2003.

**REFERENCES**

1. Ellote Rusty Harold, “Java Network Programming”, O’Reilly Publications, 1997.
2. Jason Hunter, William Crawford, “Java Servlet Programming”, O’Reilly Publications, 1998.

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**PRACTICALS****DCS 235 CASE TOOLS AND UML LAB**

1. Familiarization of features of any one of the standard UML case tool.
2. Capturing key functional requirements as Use cases and class diagram for online ticket / hotel reservation systems, student information system, sales and marketing system, banking system and inventory tracking system.
3. Interacting diagrams, state chart diagrams etc for systems in 2.
4. Implementation using any one of object oriented languages like Java, C++ for systems in 2.
5. Component diagrams, deployment diagrams for system in 2.
6. Unit test case, integration test case for systems in 2.

**DIT 236 WEB TECHNOLOGY LAB**

1. Write a program in HTML to display different styles of heading text.
2. Write a program to display the processes to be followed for a patient when he enters for a complete checkup. Use ordered lists and unordered lists.
3. Write a program to display a traditional Newspaper with the use of table tags.
4. With the help of "IMAGE" tags write a program to display the image along with some contents.
5. Use "Anchor" tag to write a program for displaying various Menus.
6. Use mapping technique, to map a particular part of image and move the control corresponding to that area. For eg. In an image, if there are bat, ball, stamp etc. When you click stamp control should move to a file call St.htm.
7. Create frames that has details above various cities.
8. Create a form to display the kinds of food available in a Restaurant. (Use checkboxes wherever necessary)
9. Write a program to "reload" a page automatically once in 5 seconds.
10. Write a program using CSS to set the background colour, font, paragraph.
11. Write a program to change the font color using class and reflect the change in h1.
12. Write a program for a) Using external CSS, to import classes for h1 (use link and import)
13. Write a program to link images using style sheets.
14. Write a program to align a text in various styles sheets.
15. Write a program to align a text in various styles.

## PRACTICAL

### DCS 241 PROJECT WORK

### DIT 001 XML AND WEB SERVICES

**UNIT I** XML Technology Family: XML – benefits – Advantages of XML over HTML, EDI, Databases – XML based standards – DTD – XML Schemas – X-Files – XML processing – DOM – SAX – presentation technologies – XSL – XFORMS – XHTML – voiceXML – Transformation – XSLT – XLINK – XPATH – Xquery

**UNIT II** Architecting Web Services: Business motivations for web services – B2B – B2C – Technical motivations – limitations of CORBA and DCOM – Service-oriented Architecture (SOA) – Architecting web services – Implementation view – web services technology stack – logical view – composition of web services – deployment view – from application server to peer to peer – process view – life in the runtime

**UNIT III** Web Services Building Block: Transport protocols for web services – messaging with web services - protocols - SOAP - describing web services – WSDL – Anatomy of WSDL – manipulating WSDL – web service policy – Discovering web services – UDDI – Anatomy of UDDI – Web service inspection – Ad-Hoc Discovery - Securing web services

**UNIT IV** Implementing XML in E-Business: B2B – B2C Applications – Different types of B2B interaction – Components of ebusiness XML systems – ebXML – RosettaNet - Applied XML in vertical industry – web services for mobile devices.

**UNIT V** XML and Content Management: Semantic Web – Role of Meta data in web content - Resource Description Framework – RDF schema – Architecture of semantic web – content management workflow – XLANG – WSFL

### TEXT BOOKS

1. Ron Schmelzer et al. “XML and Web Services”, Pearson Education, 2002.
2. Sandeep Chatterjee and James Webber, “Developing Enterprise Web Services: An Architect’s Guide”, Prentice Hall, 2004.

### REFERENCE

1. Frank P.Coyle, “XML, Web Services and the Data Revolution”, Pearson Education, 2002.

**DIT 002      CLIENT SERVER COMPUTING**

- UNIT I**      Basic concepts of Client / Server – Upsizing Down sizing – Right sizing – Characteristics – File servers – Database servers – Transactions servers – Groupware servers – Object Client/Servers – Web Servers – Middleware. Client / Server building blocks – Operating System services – Base services – External services – server scalability – Remote procedure calls – Multiservers.
- UNIT II**      SQL Database servers – server architecture – Multithread architecture – Hybrid architecture – stored Procedures – Triggers – Rules – Client / Server Transaction Processing – Transaction models – Chained and nested transactions – Transaction processing monitors – Transaction Management Standards.
- UNIT III**      Database Connectivity solutions : ODBC – The need for Database connectivity – Design overview of ODBC – Architecture – components – Applications – Driver Managers – Drivers – Data sources – ODBC 2.5 and ODBC 3.0.
- UNIT IV**      Visual C++: The Windows Programming Model – GDI – resource based programming – DLL and OLE Applications – Visual C++ components – frame work / MFC class Library – basic event handling – SDI – Appwizard – ClassWizard – Model and Models dialogues – other controls – Examples.
- UNIT V**      Multiple Document Interface – Data Management with Microsoft ODBC – OLE client – OLE server – Client / Server Data Exchange format – Dynamic Data Exchange.

**TEXT BOOKS**

1. Robert Orfali, Dan Harkey and Jerri Edwards, Essential Client / Server Survival Guide, John Wiley and sons Inc. 1996.
2. David J. Kruglinski, Inside Visual C++, Microsoft Press 1992.

**REFERENCES**

1. Bvar, B.H., Implementing Client / Server Computing : A Strategic Prospective, McGraw Hill, 1993.
2. Bruce Elbert, Client / Server Computing, Artech Press, 1994.
3. Alex Berson, Client / Server Architecture, McGraw Hill, 1996.

**DIT 003      SATELLITE COMMUNICATION**

- UNIT I**      Orbit Dynamics: Kepler's Law, Newton's Law, Orbit Parameters, Orbital perturbation, Station keeping, Geo stationary and non-Geo stationary orbits. Frequency allocation, frequency co-ordination and regulatory services, Sun transit outages, Limits of visibility, Launching vehicles and propulsion.
- UNIT II**      Space Segment: Space craft configuration, Communication payload and supporting sub systems, Satellite up link – down link, Link power budget, C/No, G/T, Noise temperature, System noise, Propagation factors, Rain and Ice effects, Polarization.
- UNIT III**      Satellite Access: Modulation and Multiplexing : Voice, Data, Video, Analog – Digital transmission system, Digital Video Broadcast, Multiple Access : FDMA, TDMA, CDMA, Assignment Methods, Spread spectrum communication, Compression – Encryption.
- UNIT IV**      Earth Segment: Transmitter, Receivers, Antennas, Terrestrial interface, TVRO, MATV, CATV, Test equipments, Measurements on G/T, c/No. EIRP, Antenna Gain.
- UNIT V**      Satellite Applications: INTELSAT series, INSAT, VSAT , Facsimile system, Weather Service, Remote sensing, Mobile Satellite Service : GSM, GPRS, INMARSAT, SRSAT, LEO, MEO, Satellite navigation System, Direct Broadcast Satellites (DBS), Direct to Home broadcast (DTH), Digital Audio Broadcast (DAB), Business TV(BTV), GRAMSAT, Specialized services – E-mail, Video conferencing, Internet.

**TEXT BOOKS**

1. Dennis Rody, "Satellite Communication", Regents / Prentice Hall, Englewood Cliffs, New Jersey, 1989.
2. Wilbur L.Pritchard, Hendir G.Snyderhoud, Rober A.Nelson, "Satellite Communication Systems Engineering", Prentice Hall, 2<sup>nd</sup> Edition, 1993.

**REFERENCES**

1. N.Agarwal, "Design of Geosynchronous Space Craft", Prentice Hall, 1986.
2. Bruce R.Elbert, "The Satellite Communication Application – Hand Book", Artech House Boston, London, 1997.
3. Tri T.Ha, "Digital Satellite Communication", 2<sup>nd</sup> edition, 1990.
4. Emanuel Fthenakis, "Manual of Satellite Communication", McGraw Hill Book Co., 1984.
5. Robert G.Winch, "Telecommunication Transmission Systems", McGraw Hill Book Co., 1993.
6. Brian Ackroyd, "World Satellite Communication and Earth Station Design", BSP Professional Books, 1990.
7. G.B.Bleazard, "Introducing Satellite Communications", NCC Publications, 1985.

**DIT 004      SUPPLY CHAIN MANAGEMENT**

- UNIT I**      Building blocks, performance measures, decisions: Building Blocks of a Supply Chain Network – Performance Measures – Decisions in the Supply Chain World – Models for Supply Chain Decision-Making.
- UNIT II**      Supply Chain Inventory Management: Economic Order Quantity Models – Reorder Point Models – Multichelon Inventory Systems.
- UNIT III**      Mathematical Foundations of Supply Chain Solutions: Use of Stochastic Models and Combinatorial Optimization in– Supply Chain Planning – Supply Chain Facilities Layout – Capacity Planning – Inventory Optimization – Dynamic Routing and Scheduling – Understanding the “*internals*” of industry best practice solutions.
- UNIT IV**      Internet Technologies and E-Commerce in SCM: Relation to ERP – E–procurement – E–Logistics – Internet Auctions – E–markets –Electronic business process optimization – Business objects in SCM.
- UNIT V**      Case Studies: Digital Equipment Case Study – IBM Case Study.

**TEXT BOOK**

1. R.B. Handfield, E.L. Nichols, Jr. “Introduction to Supply Chain Management”, Prentice Hall, 1999.

**REFERENCES**

1. Sunil Chopra and Peter Meindel, “Supply Chain Management: Strategy, Planning, and Operation”, Prentice Hall of India, 2002.
2. Jeremy F. Shapiro, “Modeling the Supply Chain”, Duxbury Thomson Learning, 2001.
3. David Simchi Levi, Philip kaminsky, and Edith Simchi Levi, “Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies”, Irwin ,McGraw Hill, 2000.
4. W.J. Hopp, M.L. Spearman, “Factory Physics: Foundations of Manufacturing Management”, Irwin, McGraw Hill, 1996.
5. N. Viswanadham, “Analysis of Manufacturing Enterprises”, Kluwer Academic Publishers, 2000.
6. Sridhar Tayur, Ram Ganeshan, Michael Magazine, “Quantitative Models for Supply Chain Management”, Kluwer Academic Publishers, 1999.
7. N. Viswanadham, Y. Narahari, “Performance Modeling of Automated manufacturing Systems”, Prentice Hall of India, 1998

**DIT 005      E-COMMERCE**

**UNIT I**      Introduction: Infrastructure for Electronic Commerce - Networks - Packet Switched Networks - TCP/IP Internet protocol - Domain name Services - Web Service Protocols - Internet applications - Utility programs - Markup Languages - Web Clients and Servers - Intranets and Extranets - Virtual private Network.

**UNIT II**      Core Technology: Electronic Commerce Models - Shopping Cart Technology - Data Mining - Intelligent Agents – Internet Marketing - XML and E-Commerce

**UNIT III**      Electronic Payment Systems: Real world Payment Systems - Electronic Funds Transfer - Digital Payment - Internet Payment Systems – Micro Payments - Credit Card Transactions – Mobile Marketing and Advertisement - Case Studies.

**UNIT IV**      Security: Threats to Network Security - Public Key Cryptography - Secured Sockets Layer - Secure Electronic Transaction - Network Security Solutions - Firewalls

**UNIT V**      Inter/Intra Organizations Electronic Commerce: EDI - EDI application in business - legal, Security and Privacy issues - EDI and Electronic commerce - Standards - Internal Information Systems - Macro forces - Internal commerce - Workflow Automation and Coordination - Customization and Internal commerce - Supply chain Management

**TEXT BOOK**

1. Ravi Kalakota and Andrew B Whinston , Frontiers of Electronic commerce, Pearson Education, 2003

**REFERENCES**

1. Brian E.Mennecke, Troy J.Strader, “Mobile Commerce: (Soft Cover): Technology,Theory and Applications”, Idea group Inc., IRM Press,2003
2. Pete Loshin, Paul A Murphy , Electronic Commerce, 2<sup>nd</sup> Edition , Jaico Publishers 1996.
3. David Whiteley, e - Commerce : Strategy, Technologies and Applications – McGraw Hill 2000.

**DCS 008 DATA MINING AND DATA WAREHOUSING**

- UNIT I** Data mining – introduction – information and production factor – Data mining Vs query tools – Data mining in marketing – Self learning computer systems – Concept learning – Data learning – Data mining and the data warehouses.
- UNIT II** Knowledge discovery process – Data selection – Cleaning – Enrichment – Coding – Preliminary analysis of the data set using traditional query tools – Visualization techniques – OLAP tools – Decision trees – Association rules – Neural networks – Genetics algorithms – KDD (Knowledge Discover in Databases) environment.
- UNIT III** Data warehouse architecture – System process – Process architecture – Design – Database schema – Partitioning strategy – Aggregations – Data marting – Meta data – System and data warehouse process managers.
- UNIT IV** Hardware and operational design of data warehouse – Hardware architecture – Physical layout – Security – Backup and recovery – Service level agreement – Operating the data warehouse.
- UNIT V** Capacity planning – Tuning the data warehouse – Testing the data warehouse – Data warehouse features.

**TEXT BOOKS**

1. Arun K. Pujari, “Data mining Techniques”, University Press, 2002.
2. Amitesh Sinha, “Data Warehousing”, Thomson Delmar Learning, 2002.

**REFERENCES**

1. Pieter Adriaans, Dolf Zantinge, “Data Mining”, Addison Wesley, 1996.
2. Sam Anahory, Dennis Murray, “Data Warehousing in the real world”, Addison Wesley, 1996.

**DCS 231      DESIGN AND ANALYSIS OF ALGORITHMS**

- UNIT I**      Introduction – Algorithm – Specification – Performance Analysis – Divide – And Conquer – General Method – Binary Search – Finding the Maximum and Minimum – Merge Sort – Quick Sort.
- UNIT II**      The Greedy Method – General Method – Knapsack Problem – Tree Vertex Splitting Dynamic Programming – General Method – Multistage Graphs – All pairs shortest paths – Single – Source Shortest paths – The travelling salesperson problem – Flow shop scheduling.
- UNIT III**      Basic Traversal and Search Techniques – Binary Trees – Graphs – Connected Components and Spanning Trees – Biconnected Components.
- UNIT IV**      Backtracking – General Method – 8 Queens Problem – Graph Coloring Branch and Bound – Method – 0/1 Knapsack Problem
- UNIT V**      NP-Hard and NP-Complete Problem – Basic Concepts – Cooke’s Theorem – NP-Hard Problems – Clique Decision Problem - Job Shop Scheduling – Code generation with Common Subexpressions – Approximation Algorithms – Introduction – Absolute Approximations – E-Approximations

**TEXT BOOK**

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, “Computer Algorithms”, Galgotia Publications Pvt. Ltd., 2002

**REFERENCES**

1. Sara Baase and Allen Van Gelde “Computer Algorithms, Introduction to Design and Analysis”, III edition, Pearson Education, Delhi, 2002.
2. Aho, Hopcroft and Ullman “The Design and Analysis of Computer Algorithm” Pearson Education, Delhi, 2001.

**DCS 232      CRYPTOGRAPHY AND DATA SECURITY**

- UNIT I**      Introduction to Number Theory: Modular arithmetic – Fermat Theorem-Euler’s theorem – Euclid’s algorithm- Extended Euclid’s Algorithm, Chinese remainder theorem – Galois Fields – Discrete logarithm- Primality Testing Using Miller – Rabin – Introduction to AKS algorithm.
- UNIT II**      Conventional Encryption: Conventional encryption model - Crypt Analysis of Caesar Cipher – Mono alphabetic Cipher – Hill Cipher – DES- Modes of Operations ECB –CBC-OFB-CTR- RC 5 – Various modes of operations – Introduction to AES – Random number generation.
- UNIT III**      Public key cryptography and Digital Signatures: Modular Exponentiation- RSA algorithm- Diffie-Hellmann key exchange- Digital Signature – Authentication protocols- Digital Signature Algorithm and Digital Signature standard.
- UNIT IV**      Message Authentication: MAC Functions, Hash functions – Authentication requirements – authentication functions – Authentication Mechanisms Using Hash and MACs – Secure Hash Algorithms – SHA-1- MD5- RIPEMD 160
- UNIT V**      Network Security: Pretty good privacy – S/MIME-IP Security overview of IP security – security associations – security association database – security policy database , AH and ESP- Tunnel Transport mode why protect – IPV6 Authentication Header – ESP – reason for having Authentication Header - Web Security

**TEXT BOOK**

1. Stallings.w, “Cryptography and Network Security: principles and Practice”, Third Edition, Pearson Education, 2003

**REFERENCES**

1. Menezes A.J.Van Oorschot and Vanstrone S.A, Handbook of Applied
2. Cryptography”, CRC Press, 1996.
3. Charlie Kaufman, Radia Perlman and Mike Speciner “ Network Security : Private Communication in a public work”, second Edition, Pearson Education, 2002.
4. N.Kohlitz, “A curse in Number Theory and Cryptography”, Springer Verlag, 1994

**DSE 004      EXTREME PROGRAMMING**

**UNIT I**      Introducing C# - Understanding .Net: The C# environment – Overview of C# - Literals, Variables and Data Types – Operators and Expressions.

**UNIT II**      Decision Making, Branching and Looping – if, if...else, switch, ...?: operators, while, do, for, foreach and jump in loops, Methods in C# - declaring methods, the main method, invoking methods, nesting methods, method parameters, pass by value and pass by reference, output parameters, Variable argument lists – Overloading methods.

**UNIT III**      Arrays – Creating an array, Variable size arrays, Array list class – Manipulating Strings – Structures, Nested Structures – Enumerations, Initialization, base types and type conversion.

**UNIT IV**      Classes and Objects – Definition, Creating objects, Constructors and destructors, Nesting, Overloaded constructors, Inheritance and Polymorphism – classical, multilevel, hierarchical inheritances, Subclass, Subclass constructors, Overriding methods, Abstract Classes and Methods, Interfaces, Interfaces and Inheritance – Operator Overloading.

**UNIT V**      Delegates – Declaration Methods, Initialization and Invocation, Multicast delegates, I/O operations – Console Input/Output, Formatting, Errors and Exceptions, Type of Errors – Exceptions – Exception for debugging.

**TEXT BOOK**

1. E. Balagurusamy, Programming in C#, Tata Mc-Graw Hill Publishing Company, New Delhi, 2002.

**REFERENCES**

1. Selvi, T. A Text book on C# : A Systematic approach to object oriented programming, Pearson Education, Delhi, 2003.
2. Lippman, C# Primer, 3<sup>rd</sup> Edition, Pearson Education, Delhi, 2002.
3. Liberty, J. Programming C#, Second Edition, O'Reilly & Associates Inc., California, 2002.
4. Albahari, B. Prayton, P. and Marill, B. C# Essentials, O'Reilly & Associates Inc., California, 2002.