AFFILIATED INSTITUTIONS

ANNA UNIVERSITY, CHENNAI

REGULATIONS 2003

CURRICULUM AND SYLLABUS

M.Sc. INFORMATION TECHNOLOGY (2 YEARS)

SEMESTER I

S.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
		THEORY				
1	BMA 001	Discrete Mathematics	3	1	0	4
2	BIT 011	Wireless Technology	4	0	0	4
3	BIT 012	Advanced Computer Architecture	4	0	0	4
4	BIT 013	Network Protocols	4	0	0	4
5	BIT 014	Object Oriented Programming	3	1	0	4
6	BIT 015	Advanced Database Management Systems	4	0	0	4
		PRACTICAL				
7	BIT 017	Object Oriented Programming Laboratory	0	0	3	2
8	BIT 018	RDBMS Laboratory	0	0	3	2
		TOTAL				**28**

SEMESTER II

S.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
		THEORY				
1	BIT 021	Mobile Computing	4	0	0	4
2	BIT 022	Distributed Operating System	4	0	0	4
3	BIT 023	Visual Programming	3	1	0	4
4	BIT 024	Object Oriented Analysis and Design	4	0	0	4
5	BIT 025	Software Project Management	4	0	0	4
6	**E1****	Elective I	4	0	0	4
		PRACTICAL				
7	BIT 027	Visual Programming Laboratory	0	0	3	2
8	BIT 028	CASE Tools and UML Laboratory	0	0	3	2
		TOTAL				**28**

SEMESTER III

S.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
		THEORY				
1	BIT 031	Multimedia Systems	4	0	0	4
2	BIT 032	Component Technology	4	0	0	4
3	BIT 033	Network Security	4	0	0	4
4	BIT 034	Network Administration	4	0	0	4
5	BIT 035	Web Technology	4	0	0	4
6	E2****	Elective II	4	0	0	4
		PRACTICAL				
7	BIT 037	Web Technology Laboratory	0	0	3	2
8	BIT 038	Software Laboratory	0	0	3	2
		TOTAL				**28**

SEMESTER IV

S.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
		PRACTICAL				
1	BIT 041	Project Work	0	0	32	16
		TOTAL				**16**

LIST OF ELECTIVES

S.NO.	SUBJECT CODE	SUBJECT	L	T	P	C
		THEORY				
1	BIT 001	Digital Signal Processing	3	0	0	3
2	BIT 002	Image Processing	3	0	0	3
3	BIT 003	Extreme Programming	3	0	0	3
4	BIT 004	Design and Analysis of Algorithms	3	0	0	3

5	BIT 005	Cryptography	3	0	0	3
6	BIT 006	Client Server Computing	3	0	0	3
7	BIT 007	High Speed Networks	3	0	0	3
8	BIT 008	Satellite Communication	3	0	0	3

BMA 001 **DISCRETE MATHEMATICSL** **L T P C**
3 1 0 4

UNIT I **LOGIC** **9**
Statements – Connectives – The Theory of Inference for Statement Calculus (Excluding Automatic Theorem Proving) – The Predicate Calculus – Inference Theory of the Predicate Calculus.

UNIT II **COMBINATORICS** **9**
Permutation – Combination – Pigeonhole Principle – The Principle of Inclusion Exclusion – Recurrence relations.

UNIT III **ALGEBRAIC STRUCTURES** **9**
Semigroups and Monoids (Definitions and examples only) – Groups – subgroups – homomorphisms – cosets and Lagrange's Theorem – Normal Subgroups – Rings and Fields (Definitions and Examples).

UNIT IV **ORDER RELATIONS AND STRUCTURES** **9**
Partially ordered sets – External Elements of partially ordered sets – Lattices – Finite Boolean algebra – Functions of Boolean Algebra – Circuit Designs.

UNIT V **GRAPHS** **9**
Graphs – Undirected Trees – Minimal spanning Trees – Euler Paths and Circuits – Hamiltonian Paths and Circuits – Transport Networks.

L : 45 T: 15 Total: 60 PERIODS

TEXT BOOKS
1. Trembly, J.P. and Manohar, R., "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill Publication Company, New Delhi, 2002. (for the Units Logic and Groups)
2. Kolman, B., Busby and Ross, S.C., "Discrete Mathematical Structures", Pearson Education, New Delhi, 2002 (for all other Units)

REFERENCE
1. Grimaldi, R.P., "Discrete and Combinatorial Mathematics", Pearson Education, New Delhi, 2002.

BIT 011   **WIRELESS TECHNOLOGY**   **L T P C**
                                                                         4 0 0 4

UNIT I   **12**
Characteristics of the Wireless Medium – Introduction – Radio Propagation Mechanisms – Path Loss Modeling and Signal Coverage – Channel Measurement and Modeling Techniques – Simulation of the radio Channel – What is db.
Applied Wireless Transmission Techniques. Short distance Base Band – UWB Pulse – carrier modulated – Digital Cellular Transmissions – Spread spectrum Transmissions.
High speed modems for spread spectrum Technology coding Techniques for wireless Transmissions.

UNIT II   **12**
Wireless Medium Access Alternatives – Fixed Assignment Access for Voice- Oriented Networks. Random access for data oriented Networks - Integration of Voice and Data Traffic.
Introduction to Wireless Networks – Wireless Network Topologies – Cellular Topology - Cell fundamentals - Capacity expansion techniques – Network Planning for CDMA Systems.

UNIT III   **12**
Mobility Management – Radio Resources and Power Management – Security in Wireless Networks GSM and TDMA Technology - Introduction to GSM – Mechanisms to support a mobile environment – communications in the infrastructure.

UNIT IV   **12**
CDMA technology – Reference Architecture – IMT 2000 - Mobile Data Networks – Data oriented CDPD Network – GPRS and Higher data rates - SMS in GSM – Mobile Application Protocols.

UNIT V   **12**
IEEE 802.11 WLAN – Physical layer – MAC sub layer – MAC Management Sub layer - Adhoc Networking – IEEE 802.15 – Home RF – Bluetooth – Wireless Geo location – Wireless Geo location System Architecture.

                                                      TOTAL : 60 PERIODS

TEXT BOOK
1. Kaveh Pahlavan, Prashant Krishnamurthy "Principles of Wireless Networks", Pearson Education, Delhi, 2002.

REFERENCES
1. Theodore S.Rappaport, "Wireless Communications : Principles and Practice", Pearson Education, Delhi, 2002.
2. William Stallings, "Wireless Communications and Networks", Pearson Education, Delhi, 2002.
3. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley, 2003.
4. Kamilia Feher, "Wireless Digital Communications", Prentice Hall of India, Delhi, 2002.

BIT 012   **ADVANCED COMPUTER ARCHITECTURE**   **L T P C**
                                                             4 0 0 4

UNIT I   **12**
Fundamentals of Computer Design – RISC vs CISC – Performance related issues – Performance Parameters – Measuring Performance. Instruction Set Architecture – Design Issues.

UNIT II   **12**
Instruction Pipelining – Hazards and Remedies – Instruction Set Design & Pipelining. Instruction Level Parallelism – Concepts.

UNIT III   **12**
Dynamic Scheduling – Dynamic Hardware Branch Prediction – Super scalar, VLIW and Vector Processors – Performance issues.

UNIT IV   **12**
Multiprocessor Architectures – Centralized Shared Memory Architectures, Distributed Shared Memory Architectures – Synchronization – Memory Organisation and Cache Coherence Issues.

UNIT V   **12**
Interconnection Networks – Examples – Internetworking. Case Studies of Typical Architectures.

                                                TOTAL : 60 PERIODS

TEXT BOOK
1. Joha L. Hennessy & David A.Patterson, "Computer Architecture A Quantitative Approach", 2nd Edition, Harcourt Asia, Morgan Kaufmann, 2000.

REFERENCES
1. K.Hwang, "Advanced Computer Architecture – Parallelism, Scalability & Programmability", McGraw Hill, 1993.
2. Richard Y.Kain, " Advanced Computer Architecture, A System Design Approach", Prentice Hall of India, Delhi, 1999.

BIT 013   **NETWORK PROTOCOLS**   **L T P C**
                                                            4 0 0 4

UNIT I   **12**
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   **12**
Internet Multicasting – Mobile IP – Bootstrap And Auto configuration (BOOTP, DHCP).

UNIT III   **12**
The Domain Name System (DNS) – Applications : Remote Login (TELNET, Rlogin) – File Transfer and Access (FTP, TFTP, NFS).

UNIT IV   **12**
Applications : Electronic Mail (SMTP, POP, IMAP, MIME) – World Wide Web (HTTP) – Voice and Video over IP (RTP).

UNIT V   **12**
Applications : Internet Management (SNMP) – Internet Security and Firewall Design (Ipsec) – The Future of TCP / IP (IPV6).

                                                         TOTAL : 60 PERIODS
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. Uyless Black, 'Computer Networks – Protocols, Standards and Interfaces", Second Edition, Prentice Hall of India, Delhi, 2002.
2. Udupa, "Network Management System essentials", McGraw Hill, 1999.

BIT 014   **OBJECT ORIENTED PROGRAMMING**   **L T P C**
                                                                3 1 0 4

UNIT I   C++ PROGRAMMING   9
Introduction to C++ - Tokens, expressions and control structures – Functions in C++ - Classes and Objects – Constructors – Destructors – Operator Overloading and Type conversions.

UNIT II   NHERITANCE, POLYMORPHISM AND FILES   9
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   9
Templates – Function templates – class Templates – Overloading of Template Functions – Member function Templates – Exception handling – basics – Exception handing mechanism – Throwing mechanism catching mechanism – Rethrowing an exception – specifying exceptions.

UNIT IV   INTRODUCTION TO JAVA   9
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   9
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.

                                            L : 45 T: 15 Total: 60 PERIODS
TEXT BOOKS
1. E. Balagurusamy, "Object Oriented Programming", 2nd 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.

BIT 015   ADVANCED DATABASE MANAGEMENT SYSTEMS   L T P C
4 0 0 4

UNIT I   10
Introduction **-**Relational Database Concepts – Query Processing – Query Optimization – Transaction Concepts - Properties of Transactions – Serializability – Concurrency Control – Lock Based Protocols – Time Stamp Based Protocols – Recovery Systems – Log Based Recovery – Advanced Recovery Techniques.

UNIT II   10
Distributed And Parallel Databases - Homogeneous and Hetrogeneous Databases – Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Parallel Databases – I/O Parallelism – Inter Query and Intra Query Parallelism – Inter and Intera Operation Parallelism – Design of Parallel Systems.

UNIT III   10
Object-Based Databases And XML - Object Oriented Databases – Complex Data Types – 00 Data Model – 00 Languages – Persistence – Object Relational Databases – Nested Relations – Inheritance – Reference Types – Querying with Complex Types – Functions and Procedures – XML – Structure of XML - Data XML Document Schema – Querying and Transformation – Application Program Interface – Storage of XML Data – XML applications.

UNIT IV   15
Administration advanced Querying and retrieval - Performance Turing – performance Benchmarks – Decision support Systems – Data Analysis and OLAP – Data Mining – Data Warehousing – Information Retrieval Systems.

UNIT V   15
Special Purpose Databases - Temporal Databases – Deductive Databases – Mobile Databases – Multimedia Databases – Spatial Databases – Active Databases.

TOTAL : 60 PERIODS

TEXT BOOK
1. Abraham Silberschatz, Henry F.Korth and S.Sudarshan, "Database System Concepts", Fourth Edition, McGraw Hill, 2002.

REFERENCES
1. Raghu Ramakrishnan and Johannes Gehrke, "Database Management Systems", McGraw Hill, 2000.
2. Ramez Elmasri and Shamkant B.Navathe, "Fundamentals of Database Systems", Pearson Education Asia, 2002.

BIT 017   OBJECT ORIENTED PROGRAMMING LABORATORY   L T P C
0 0 3 2

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

TOTAL : 45 PERIODS

BIT 018   **RDBMS LABORATORY**   **L T P C**
                                                                      0 0 3 2

1.   Library Information Processing

2.   Students Mark sheet processing

3.   Telephone Directory maintenance

4.   Gas booking and delivering system

5.   Electricity Bill Processing

6.   Bank Transactions.

7.   Pay roll processing

8.   Personal Information System

9.   Question Database and Conducting quiz.

                                                      TOTAL : 45 PERIODS

BIT 021   **MOBILE COMPUTING**   **L T P C**
                                                                                     4 0 0 4

UNIT I   INTRODUCTION   12
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   12
Telecommunication Systems – GSM – Architecture – Sessions – Protocols – Hand Over and Security – UMTS and IMT-2000 – Satellite Systems.

UNIT III   WIRELESS LAN   12
IEEE S02.11 – Hiper LAN – Bluetooth – MAC layer – Security and Link Management.

UNIT IV   MOBILE IP   12
Goals – Packet Delivery – Strategies – Registration – Tunneling and Reverse Tunneling – Adhoc Networks – Routing Strategies.

UNIT V   WIRELESS APPLICATION PROTOCOL   12
Wireless Application Protocol (WAP) – Architecture – XML – WML Script – Applications.

                                                                          TOTAL : 60 PERIODS
TEXT BOOK
1. Jochen Schiller, "Mobile Communications", Pearson Education, Delhi, 2000.

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

BIT 022   **DISTRIBUTED OPERATING SYSTEM**   **L T P C**
                                                                  4 0 0 4

UNIT I   **12**
Fundamentals – evolution – System Models – Distributed operating System – Issues –
Distributed Computing environment Message passing – Introduction – Features – Issues
– Synchronization – Buffering – Message – Encoding – Decoding – Process addressing
– Failure Handling.

UNIT II   **12**
Remote Procedure calls – Introduction – Model – Transparency – Implementation – Stub
Generation – Messages – Marshaling Arguments and results –server Management –
Parameter passing Semantics   - Call Semantics – Communication Protocols –
Complicated RPC's – Client – Server Binding – Exception handling – Security
Distributed shared Memory – Introduction – Architecture – Issues – Granularity Structure
– Consistency Models – Replacement Strategy – Thrashing.

UNIT III   **10**
Synchronization – Introduction – Clock Synchronization – Event ordering – Mutual
Exclusion – Deadlock – Election Algorithms.

UNIT IV   **14**
Resource Management – Introduction – Features – Task Assignment approach – Load-
Balancing Approach - Load -Sharing Approach Process Management – Introduction –
Process Migration – Threads.

UNIT V   **12**
Distributed File Systems – Introduction – Features – File Models – Accessing Models –
Sharing Semantics – Caching Schemes – File Replication – Fault Tolerance – Atomic
Transactions – Design Principles Naming – Introduction – Features – Terminologies –
Concepts.

                                                              TOTAL : 60 PERIODS
TEXT BOOK
1. Pradeep K. Sinha, "Distributed Operating Systems, Concepts and Design" Prentice
   Hall of India, New Delhi, 2001.

REFERENCES
1. Andrew S. Tanenbaum "Distributed Operating Systems", Pearson Education, Delhi,
   2002.
2. Mukesh Singhal and Nirajan G.Shivaratri "Advanced Concepts in Operating
   Systems", Tata McGraw Hill Publishing Company, New Delhi, 2001.

BIT 023   **VISUAL PROGRAMMING**   **L T P C**
                                                                         3 1 0 4

UNIT I   **9**
Introduction to Widows 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   **9**
Visual Basic Programming – Forum Design – VBX Controls – Properties – Event Procedures – Menus and Toolsbars – Using Dialog Boxes – Working with Control Arrays – Active X Controls – Multiple Documents Interface (MDI) – File System Controls – Data Control – Database Applications.

UNIT III   **9**
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   **9**
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   **9**
Basics of GUI Design – Visual Interface Design – File System – Storage and Retrieval System – Simultaneous Multi Platform Development.

L : 45 T: 15 Total: 60 PERIODS

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. Pappar 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.

BIT 024   **OBJECT ORIENTED ANALYSIS AND DESIGN**   **L T P C**
                                                                             4 0 0 4

UNIT I   **OBJECT BASIS**   **12**
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**   **12**
Rumbaugh object Model, Booch methodology Jacobson methodology, patterns, frame works and unified approach.

UNIT III   **OBJECT ORIENTED ANALYSIS**   **12**
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**   **12**
On design process – Design axioms – design patterns – designing classes. Case study.

UNIT V   **UML AND PROGRAMMING**   **12**
Introduction to unified modeling language – UML diagrams – class diagrams and use case diagrams – State and dynamic models. Case study to inventory, sales and banking.

                                                             TOTAL : 60 PERIODS

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.

BIT 025   **SOFTWARE PROJECT MANAGEMENT**   **L T P C**
                                                                     4 0 0 4

UNIT I   **12**
Introduction – Product Life – Project life cycle models - water fall model – Prototyping model – RAD model – Spiral Model – Process Models – Matrics.

UNIT II   **12**
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   **12**
Project initiation – Project Planning and tracking – what, cost, when and how – organisational processes – assigning resources – project tracking – project closure – when and how.

UNIT IV   **12**
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 – diagonosability etc.

UNIT V   **12**
Project Management in testing phase – in the maintenance phase – Impact on internet on project Management.

                                                         TOTAL : 60 PERIODS
TEXT BOOK
1.   Gopalaswamy Ramesh, "Managing Globle Software Projects" Tata McGraw Hill Publishing Company Ltd, New Delhi, 2002

REFERENCE
1.   Bob Hughes and Mike Cotterell "Software Project Management"2nd edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.

BIT 027   **VISUAL PROGRAMMING LABORATORY**   **L T P C**
                                                               0 0 3 2

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.

TOTAL : 45 PERIODS

BIT 028   **CASE TOOLS AND UML LABORATORY**   **L T P C**
                                                                0 0 3 2

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.

TOTAL : 45 PERIODS

BIT 031   **MULTIMEDIA SYSTEMS**   **L T P C**
                                                        4 0 0 4

UNIT I   **12**
Overview – Multimedia and Personalized computing – emerging applications – convergence of computers. Communication and entertainment products – perspective and challenges – Architecture and issues for distributed multimedia systems – synchronization and QOS – Standards and framework.

UNIT II   **12**
Digital Audio representation and processing – representation, Transmission and processing of saved – audio signal processing – digital music making – Brief survey of speech recognition and generation Video Technology – raster scanning – colour fundamentals and Video performance measurements – Artifacts – Video equipment – TV standards.

UNIT III   **12**
Digital Video and image compression – introduction – video compression techniques – JPEG – H.261 – MPEG – DVI Technology –Time Based media representation and delivery – models of time – Time and multimedia requirements – support.

UNIT IV   **12**
O.S. support for continuous media applications – limitations in workstation O.S. – New OS support – experiments using real time mach – middle ware system services architecture – media stream protocol.

UNIT V   **12**
Multimedia Devices, Presentations services and the user interface – multimedia services and window system, client, device control – Tool kits – Multimedia file systems and information models – File system support – data models – multimedia presentation and authoring – current state of the industry – Design paradigms and user interfaces.

                                                        TOTAL : 60 PERIODS
TEXT BOOK
1. John F. Koegel Bufend , "Multimedia systems", Pearson Education, Delhi, 2002.

REFERENCES
1. Vaughan. T, "Multimedia making it work", Fifth edition, Tata McGraw Hill, 2001.
2. K.R. Rao, Zoron S. Bojkovil, Dragarad A. Milovanovic, "Multimedia Communication Systems", Printice Hall, India, Pvt. Ltd., 2002.

BIT 032   **COMPONENT TECHNOLOGY**   **L T P C**
                                                      4 0 0 4

UNIT I   INTRODUCTION   12
Objects – distributed objects – Historical perspective on Distributed objects and computing methodologies.

UNIT II   CORBA   12
Architecture – Interface Definition Language – Static and dynamic method invocation-Interface Repository – Basic Object adapter – Services.

UNIT III   DEVELOPMENT OF A CORBA APPLICATION   12
Client applet – Server – IDL contract – Database interface.

UNIT IV   DCOM   12
Model and services – Objects and Object hierarchies – Location transparency – Configuration information – interface definition language (MIDL) –   Applications.

UNIT V   CURRENT ISSUES   12
Internet Inter Orb Protocol – CORBA – DCOM interoperability issues – CORBA facilities – CORBA domains – CORBA migration process – Other distributed object paradigms.

                                                 TOTAL : 60 PERIODS
TEXT BOOK
1.   Mowbray, T.J. and Ruh, W.A., "Inside CORBA", Addition Wesley, 1997.

REFERENCES
1.   Orfali, R. and Harkey, D. "Client / Server Programming with Java and CORBA", 2nd Edition, John Wiley and Sons, 1999.
2.   Henning, M. and Vnonki, S. "Advanced CORBA Programming with C++", Addition Wesley, 1999.
3.   Slama, Garbis and Russel, "Enterprise CORBA", Addition Wesley, 1999.
4.   Redmond, F.E., "DCOM: Microsoft Distributed Component Object Model", IDG Books Worldwide Inc., 1997.
5.   Sessions, R., "COM and DCOM", John Wiley and Sons, 1998.
6.   Thai, T.I. "Learning DCOM", O'Reilly, 1999.

BIT 033   **NET WORK SECURITY**   **L T P C**
                                                                        4 0 0 4

UNIT I   **12**
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   **12**
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   **12**
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   **12**
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   **12**
Network Security Application – Email Security – distribution lists – store and forward – security services for email – establishing keys privacy – authentication of the source – massage 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.

                                                            TOTAL : 60 PERIODS
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.

BIT 034   **NETWORK ADMINISTRATION**   **L T P C**
                                                                4 0 0 4

UNIT I   **12**
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   **12**
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   **12**
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   **12**
Configuring Apache – Installing Apache software – configuring the Apache server – understanding an Lttpd. 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   **12**
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 – Protocal 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.

                                                        TOTAL : 60 PERIODS
TEXT BOOK
1. Craig Hunt, "TCP / IP Network Administration", 3rd 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", 3rd 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.

BIT 035   **WEB TECHNOLOGY**   **L T P C**
                                                                   4 0 0 4

UNIT I   **12**
Internetworking concepts – Devices – Repeaters – Bridges – Routers – Gatways – Internet topology Internal Architecture of an ISP – IP Address – Basics of TCP – Features of TECP – UDP – DNS – Email – FTP – HTTP – TELNET.

UNIT II   **12**
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   **12**
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 Bears – 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   **12**
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   **12**
Online Applications and Emerging technologies - Online Shopping – Online databases – Monitoring user events – Need for .NET - Overview of .NET Framework – Web services.

                                                              TOTAL : 60 PERIODS

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.

BIT 037   **WEB TECHNOLOGY LABORATORY**   **L T P C**
                                                               0 0 3 2

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 stump 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.

TOTAL : 45 PERIODS

BIT 038   **SOFTWARE LABORATORY**   **L T P C**
                                                                  0 0 3 2

1. Preparation of Project Management Plan.

2. Using any of the CASE tools, Practice requirement analysis and specification for different firms.

3. Case study of cost estimation models.

4. Practice object oriented design principles for implementation.

5. Practice function oriented design.

6. Practice creating software documentation for all the phases of software development life cycle with respect to any real time application.

7. Simulate a tools for path testing principles.

8. Simulate a tools for testing based on control structures.

9. Simulate a tools that reflects black box testing concepts

TOTAL : 45 PERIODS

BIT 041   **PROJECT WORK**

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0   0   32 16

       The project will be of one semester duration. The students will be sent to different organizations involved in science communication activities as per interest and specialization of students, mostly located in the place of the study. They will have to carry out a research project related to the area of interest and submit a research project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce Examniation.

BIT 001   **DIGITAL SIGNAL PROCESSING**   **L T P C**
                                                                                     3 0 0 3

UNIT I   DISCRETE TIME SIGNALS AND SYSTEMS   9
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   9
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   9
Butterworth, Chebyshere, 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 Blarkmann windows – Linear phase condition.

UNIT IV   DIGITAL FILTER STRUCTURES   9
Block diagram representation – signal Flow graph representation – Basic FIR Digital filter Structures – transversal and poly phase – Direst form I, Direst form II, cascade and parallel structures for IIR filters.

UNIT V   ALGORITHM IMPLEMENTATION AND FINITE WORD LENGTH
                 EFFECTS   9
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.

TOTAL : 45 PERIODS

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.Schafer, Prentice Hall of India, New Delhi, 1992.

BIT 002   **IMAGE PROCESSING**   **L T P C**
                                                                        3 0 0 3

UNIT I   **9**
Introduction – Problems and applications – Two dimensional systems and mathematical
preliminaries Linear systems and shift invariance – Fourier transform – Properties –
Fourier series – Matrix theory results – Block matrices and kronecker products.

UNIT II   **9**
Image perception – light, luminance, brightness and contrast – MTF of visual systems –
Monochrome vision models – Image fidelity criteria – color representation.
Digital image sampling and quantization – 2D sampling theory – Image reconstruction
from samples, Band limited images, sampling theorem, Nuquist rate, Abasing and filled
over frequencies – Image quantization – Optimum mean square quantizer.

UNIT III   **9**
Image enhancement – point operations – contrast structuring, clipping and thresholding
etc – Histogram modeling – Spairal operations – special averaging and low pass
filtering, Directorial smoothing, median filtering, Replication, Linear interpolation,
Magnification and interpolation (Zooming) – false color and pseudo color.

UNIT IV   **9**
Image restoration – Image observation models – Inverse and wiener filtering – Least
square filters – Image analysis – Edge detection – Boundary extraction – Boundary
representation – Region representation – Image segmentation – Classification
techniques – Image understandings.

UNIT V   **9**
Image data compression – Pirel coding – PCM, Entrophy coding, Runlength, Bitplane
extraction – Predictive techniques – Delta modulation line by line DCPM etc – Interface –
Coding of two tone images.
                                                              TOTAL : 45 PERIODS
TEXT BOOK
1. Anil K.Jain, "Fundamentals of digital image processing", Prentice Hall information
   and System Science series, 1989.

REFERENCES
1. Pratt W.K. ,"Digital Image Processing", 2nd Edition, John Wiley & Sons, 1991.
2. Rosenfied A. & Kak, A.C., "Digital Picture Processing", Vol. I & II, academic press,
   1982.
3. Nick Efford – Digital Image Processing: A Practical introduction using Java – Addison
   Wesley / Benjamin Cummings, 2000.

BIT 003   **EXTREME PROGRAMMING**   **L T P C**
                                                                 3 0 0 3

UNIT I   **9**
Introducing C# - Understanding .Net: The C# environment – Overview of C# - Literals, Variables and Data Types – Operators and Expressions.

UNIT II   **9**
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   **9**
Arrays – Creating an array, Variable size arrays, Array list class – Manipulating Strings – Structures, Nested Structures – Enumerations, Initialization, base types and type conversion.

UNIT IV   **9**
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   **9**
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.

                                                      TOTAL : 45 PERIODS
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, 3rd 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.

BIT 004   **DESIGN AND ANALYSIS OF ALGORITHMS**   **L T P C**
                                                                    3 0 0 3

UNIT I   **9**
Introduction – Algorithm – Specification – Performance Analysis – Divide – And Conquer – General Method – Binary Search – Finding the Maximum and Minimum – Merge Sort – Quick Sort.

UNIT II   **9**
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   **9**
Basic Traversal and Search Techniques – Binary Trees – Graphs – Connected Components and Spanning Trees – Biconnected Components.

UNIT IV   **9**
Backtracking – General Method – 8 Queens Problem – Graph Coloring
Branch and Bound – Method – 0/1 Knapsack Problem

UNIT V   **9**
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 .

                                                        TOTAL : 45 PERIODS
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, Hoporoft and Ullman "The Design and Analysis of Computer Algorithm" Pearson Education, Delhi, 2001.

BIT 005   **CRYPTOGRAPHY**   **L T P C**
                                                              3 0 0 3

UNIT I   CONVENTIONAL ENCYRTION   9
Conventional encryption model – DES – RC 5 – Introduction to AE 5 – Random number generation.

UNIT II   NUMBER THEORY AND PUBLIC KEY CRYPTOGRAPHY   9
Modular arithmetic – Euler's theorem – Euclid's algorithm – Chinese remainder theorem – Primality and factorization – Discrete logarithms – RSA algorithm – Difie heimann key exchange.

UNIT III   MESSAGE AUTHORISATION AND HASH FUNCTIONS   9
Hash functions – Authentication requirements – authentication function – Message Authentication codes – Secure Hash Algorithms.

UNIT IV   DIGITAL SIGNATURE AND AUTHENTICATION PROTOCOLS   9
Digital Signature – Authentication Protocols – Digital Signature Standard.

UNIT V   NETWORK SECURITY   9
Prettry good privacy – S/MIME-IP Security Overview – Web Security.

                                                         TOTAL : 45 PERIODS
TEXT BOOK
1. Stallings, W., "Cryptography and Network Security Principles and Practice", Pearson Education, Delhi, 2003.

REFERENCES
1. E. Biham and A. Shamir, "Differential Crypt analysis of the data encryption standard", Springer Veriag, 1993.
2. D. Denning, "Cryptography and data security", Addition Wesley, 1982.
3. N. Kobliz, A course in Number Theory and Cryptography, Springer Veriag, 1994.

BIT 006 **CLIENT SERVER COMPUTING** **L T P C**
  3 0 0 3

UNIT I **9**
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 **9**
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 **9**
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 **9**
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 **9**
Multiple Document Interface – Data Management with Microsoft ODBC – OLE client – OLE server – Client / Server Data Exchange format – Dynamic Data Exchange.

  TOTAL : 45 PERIODS
TEXT BOOKS
1. Robert Orfali, Dan Harkey and Jerri Edwards, Essential Client / Server Survial 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.

BIT 007   **HIGH SPEED NETWORKS**   **L T P C**
                                                                    3 0 0 3

UNIT I   HIGH SPEED NETWORKS   9
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   9
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   9
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   9
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   9
ATM signaling fundamentals and meta-signaling. TCP/IP over ATM-challengers and proposal LAN emulation over ATM. Performance of Data Communication over   ATM.

                                                           TOTAL : 45 PERIODS
TEXT BOOK
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", Addision Wesley, 1997.
2. Stallings W,"ISDN with frame relay and ATM", P.H.International, 1995.

BIT 008   **SATELLITE COMMUNICATION**   **L T P C**
                                                                        3 0 0 3

UNIT I   ORBIT DYNAMICS   5
Keepler'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   10
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   12
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   8
Transmitter, Receivers, Antennas, Terrestial interface, TVRO, MATV, CATV, Test equipments, Measurements on G/T, c/No. EIRP, Antenna Gain.

UNIT V   SATELLITE APPLICATIONS   10
INTELSAT series, INSAT, VSAT , Facsimile system, Weather Service, Remote sensing, Mobile Satellite Service : GSM, GPSM, INMARSAT, SARSAT, 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, Vedio conferencing, Internet.

                                                          TOTAL : 45 PERIODS
TEXT BOOKS
1. Dennis Rody, "Satellite Communication", Regents / Prentice Hall, Englewood Cliffs, New Jersey, 1989.
2. Wilbur L.Pritchard, Hendir G.Suyderhoud, Rober A.Nelson, "Satellite Communication Systems Engineering", Prentice Hall, 2nd 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 Bostan, London, 1997.
3. Tri T.Ha, "Digital Satellite Communication", 2nd edition, 1990.
4. Emanuel Fthenakis, "Manual of Satellite Comunication", 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.