

**SGGS INSTITUTE OF ENGINEERING AND TECHNOLOGY
VISHNUPURI- NANDED**

DEPARTMENT OF INFORMATION TECHNOLOGY

REVISED SYLLABI FOR B. TECH (IT)

Code	Name of the course	Total No of credits	Lecture s /week	Practical s/ week
IT-401	Cryptography and Network Security	4	3	2
IT-402	Compiler Construction	4	3	2
IT-403	Distributed Systems	3	3	-
IT-404	Data Mining and Data Warehousing	4	3	2
IT-405	Elective I	3	3	-
IT-406	Project - V	2	-	2
	Total Credits for part - I	20	15	08
IT-407	Multimedia Systems	4	3	2
IT-408	Mobile & Wireless Communication	4	3	2
IT-409	E-Commerce	4	3	2
IT-410	Elective II	3	3	-
IT-411	Web Technology Laboratory	1	1	2
IT-412	Project - VI	2	-	2
	Total for part - II	18	13	10
	Grand Total	38	28	18

ELECTIVE I (CHOOSE ANY ONE)

- 1.Embedded Systems
- 2.Management Information Systems
- 3.Cloud Computing
- 4.Object Oriented System Development

ELECTIVE II (CHOOSE ANY ONE)

- 1.Business Economics
- 2.Real Time Systems
- 3.Grid Computing
- 4.Ethics in Information Technology
- 5.Advanced Database Management Systems

SEMESTER I

IT-401: CRYPTOGRAPHY AND NETWORK SECURITY

(Total Credits: 5, Lecture/week:4, Practicals/week: 2)

- 1.Introduction: attacks, services, mechanism, security attacks, security services, model of internet work security
2. Conventional Encryption Classical techniques - conventional encryption model, steganography
- 3.Modern techniques- simplified DES, Block cipher principles, DES, Strength of DES, differential and linear cryptanalysis, block cipher design principles, modes of operation.
4. Algorithms: Triple DES, International DE algorithm, Blowfish, RC-5, Cast-128, RC-2, Characteristics of advanced symmetric block ciphers
- 5.Confidentiality using conventional encryption: Placement of encryption function, traffic confidentiality, key distribution, random number generation.

Public Key Encryption and Hash Functions:

1. Public key cryptography: Principles, RC algorithm, key management, Diffie-Hellman key exchange, Elliptic curve cryptography
- 2.Introduction to number theory, prime and relatively prime numbers, modular arithmetic, Fermat's and Euler's theorem, testing for primality, Euclid's algorithm, Chinese remainder theorem, discrete logarithms
- 3.Message Authentication and Hash functions: Authentication requirements, Authentication functions, message authentication codes, hash functions, security of hash functions and MACs
- 4.Hash and MAC Algorithm: MD5 message digest algorithm, secure hash algorithm (SHA-1), RIPEMD-160, HMAC
- 5.Digital signature and authentication protocols, Digital signature standard

Network Security Practice

- 1Authentication Applications: Kerberos, X.5.9 directory authentication service
- 2Electronic mail security: PGP, SS/MIME
- 3IP Security: Overview and architecture, authentication header, encapsulating security payload, combining security associations, key management
- 4Web security: requirements, secure sockets layer and transport layer security, secure electronic transaction

System Security and Firewalls:

- 1.Intruders, viruses, and worms, firewalls, firewall design principles, trusted systems.

REFERENCE BOOKS:

1. William Stallings, Cryptography and Network Security: Principles and Practice, Prentice Hall Pearson Education, 2000
2. Network Security Fundamentals, Peter Norton, Techmedia Publications.
3. Practical Cryptography, Bruce Schneier, Wiley Internationals

IT-402: EMBEDDED SYSTEMS

(Total Credits: 5, Lecture/week:4, Practicals/week: 2)

1. Embedded Systems: Introduction, hardware/software co-design, issues in deciding where to split the problem. Examples of embedded systems, sensors and interfacing techniques. Design Challenges, Processor Technology, IC Technology, Design Technology, Trade-offs.
2. Custom Single purpose processors: Hardware, Combinational logic design, Sequential logic design, Custom single purpose processor design, RT level Custom Single purpose processor design, Optimization.
3. General Purpose processors: Software, Datapath, control unit, Memory, pipelining, superscalar and VLIW architectures, Programmers view: Instruction set, program and data memory space, I/O, interrupts, operating system, Development environment: design flow and tools, testing and debugging, Application specific instruction set processors (ASIPs), microcontrollers, digital signal processors, less-general AIP environments, selecting microprocessors, general purpose processor design.
4. Standard single purpose processor peripherals: Introduction, timers, counters and watchdog timers, UART, Pulse width modulators, controlling a DC motor using PWM, LCD controllers, Keypad controllers, stepper motor controllers, ADCs, Real time clocks.
5. Memory: Memory write ability and storage permanence, common memory types, composing memory, memory hierarchy and cache, advanced RAM.
6. Interfacing: Introduction, Communication basics, Basic protocol concepts, ISA bus protocol: memory access, Arbitration, Priority arbiter, Daisy chain Arbitration, Network oriented Arbitration methods, multilevel bus architectures, Advanced communication principles, Parallel and serial communication, wireless communication, Layering, error detection and correction, serial protocols, parallel protocols, wireless protocols: IrDA, Bluetooth, IEEE802.11
7. Digital camera example: Requirement specification, design
8. State machine and Concurrent process Models: Introduction, Models and Languages, Basic state machine model: FSM, FSM with datapath model, using state machines, concurrent process model, Concurrent processes, communication among processes, synchronization among processes, implementation, dataflow model, Real Time systems.
9. Real-time OS and concepts: Introducing the problem domain and tools, RTOS services/capabilities (in contrast with traditional OS), Resource Management / scheduling paradigms: static priorities, static schedules, dynamic scheduling, best effort, current best practice in scheduling (e.g. Rate Monotonic vs. static schedules),

Real-world issues: blocking, unpredictability, interrupts, caching, examples of OS' s for embedded systems (RT Linux/ VRT), selected case studies.

10.Programming Languages for Embedded Systems: Tools for building embedded systems - with case studies. Esterel is good for control applications / Handel-C is good for casting algorithms into re-configurable hardware, Embedded Software Development Methodology.

Term Work:

The term work shall consist of a record of at least ten programs / assignments developed by the students to understand the concepts of the above syllabus.

Practical Examination:

Practical examination shall consist of an oral based on the above term work, and will be conducted by two examiners appointed by the university.

Reference Books

- 1.Frank Vahid and Tony Givargis, Embedded system design: A unified hardware/software introduction, John Wiley and sons, 2002
- 2.D. E. Simon, An embedded software primer, Pearson Education, 2002
- 3.Wayne Wolf, Computers as components: Principles of embedded computing system design, Morgan Kaufman/Harcourt India, 2000
- 4.C. M. Krishna, Kang G Shin, Real time systems, McGraw Hill
- 5.Embedded Microcomputer Systems, Real time interfacing, Thomson Brooks/Cole
- 6.D. W. Lewis, Fundamentals of embedded software, Pearson Education
- 7.J. W. S. Liu, Real time systems, Pearson Education
- 8.Silberchatz, Galvin, Gagne, Operating system concepts, John Wiley

IT-403: DISTRIBUTED SYSTEMS

(Total Credits: 4, Lecture/week:4, Practicals/week: 0)

- 1.Introduction: Definition, Goals, Hardware and software concepts, Client server models.
- 2.Communications: Layered protocols, Remote procedure call, Remote Object Invocation, Message oriented communications, Stream oriented communications.
- 3.Processes: Threads, clients, Servers, Code Migrations, Software Agents.
- 4.Naming: Naming Entities, Locating Mobile entities, Removing Unreferenced entities.
- 5.Synchronization: Clock Synchronizations, Logical Clocks, Global States, election Algorithms, Mutual Exclusion, Distributed Transactions.
- 6.Consistency and Replications: Introductions, Data Centric consistency models, Client centric consistency model, Distribution Protocols, Consistency protocols
- 7.Fault Tolerance: Introduction, Process Resilience, Reliable Client-server communication, Distributed Commit, Recovery.
- 8.Distributed Object based systems: CORBA, Distributed COM, GLOBE and their comparisons.
- 9.Distributed file systems: Sun network file system, The coda file systems, Other file systems and their comparisons

10. Distributed document based systems: WWW and lotus notes and its comparison, Distributed coordinate based systems

REFERENCE BOOKS:

1. Distributed Systems, principals and paradigms by Andrew S. Tanenbaum and Maarten van Steen
2. Distributed Systems, Concepts and Design by George Coulouris, Jean Dollimore, Tim Kindberg

IT-404: DATA MINING & DATA WAREHOUSING

(Total Credits: 5, Lectures/week:4, Practicals/week: 2)

1. Introduction: - What is Data Warehousing?, Data Warehousing Concepts, Characteristics of Data Warehouse, Data Marts Goals and Objectives.
2. Data Warehouse Architecture: - System Processes, Process Architecture.
3. Methodology for Data Warehousing: -Data Warehouse Implementation, Transforming Operational data into informational data, Data Warehouse database servers-The heart of data warehouse, Structure of data warehouse.
4. Issues involved in data warehousing: -Using the data warehouse, other considerations, an example of data warehouse.
5. Explanation of star and snowflake schema: - Star schema, Benefits of data warehousing.
6. Online Analytical Processing: - Introduction, OLTP and OLAP systems, Data modelling, OLAP tools.
7. Data Mining: - What is data mining? Data mining: Definitions, KDD vs. Data Mining, DBMS vs. DM, DM Techniques, Other mining problems, Issues and challenges in DM, DM application areas, DM application.
8. What is Metadata? : - Abstraction, Use of Metadata in data warehousing.
9. Data Mining Primitives, languages and system architecture: -Data mining primitives: What defines a data mining task? A data mining query language, Designing graphical user interface based on data mining query language, Architecture of data mining systems.
10. Applications and trends in data mining: -Data mining applications, Data mining system products and research prototypes, Additional themes on data mining Social impacts of data mining, Trends in data mining.

Term Work:

The term work shall consist of a record of at least ten programs / assignments developed by the students to understand the concepts of the above syllabus.

Practical Examination:

Practical examination shall consist of an oral based on the above term work, and will be conducted by two examiners appointed by the university.

Reference Books:

1. Data Warehousing, Amitesh Sinha, Thomson.

- 2.Data Mining concepts and Techniques, Jiawei Han and Michele Kamber, Morgan Kaufmann Publishers.
- 3.Data Mining Techniques, Arun K. Pujari, Universities Press.
- 4.Data Warehousing Concepts, Techniques, Products and Applications, Second Edition, C.S.R. Prabhu, Prentice-Hall of India.
- 5.Data Warehousing in the real world, Sam Anahory and Dennis Murray, Pearson Education.
- 6.Decision Support and Data Warehouse Systems, Efrem G. Mallach, Tata McGraw-Hill Edition.

IT-405: ELECTIVE-I

(Total Credits:5, Lectures/week:4, Practicals/week: 2)

I. DIGITAL IMAGE PROCESSING (IT-405-I)

- 1.Introduction: Digital Image Representation, Fundamental steps in Image Processing, Elements of Digital Image Processing systems,
- 2.Digital Image Fundamentals: Elements of Visual Perception, A Simple Image Model, Sampling and Quantization, Some basic relationship between Pixels, Image Geometry, Photographic Film.
- 3.Image Transforms: Introduction to the Fourier Transform, The Discrete Fourier Transform, Some properties of the Two-Dimensional Fourier Transform, The Fast Fourier Transform, Other Separable Transforms, The Hotelling Transforms.
- 4.Image Enhancement: Background, Enhancement by Point Processing, Spatial Filtering, Enhancement in the Frequency Domain, Generation of Spatial Mask from Frequency Domain Specification, Color Image processing.
- 5.Image Restoration: Degradation Model, Diagonalixation of Circulant and Block-Circulant Matrices, Algebraic approach to Restoration, Inverse Filtering, Least Mean Square (Wiener) Filter, Constrained Least Squares Restoration, Interactive Restoration, Restoration in the Spatial Domain, Geometric Transformations.
- 6.Image Compression: Fundamentals, Image Compression Models, Image Compression Models, Elements of Information Theory, Error-Free Compression, Lossy Compression, Image Compression Standards.
- 7.Image Segmentation: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Oriented Segmentation, The use of Motion in Segmentation.
- 8.Representation and Description: Representation Schemes, Boundary Descriptors, Regional Descriptors, Morphology, And Relational Descriptors.
- 9.Recognition and Interpretation: Elements of Image Analysis, Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods, Interpretation.

Reference BOOKS

1. Digital Image Processing, Gonzalez, AWPC.
2. Fundamentals of DIP, Jain, PHI.

II. MANAGEMENT INFORMATION SYSTEMS. (IT-405-II)

1. Introduction: Overview of MIS structure, Classification of MIS, Hardware, Software and communication support for MIS, Operating elements of MIS, Comparison of MIS with DBMS, OR, DSS, Managerial accounting.
2. Information: Definition, Information presentation, Quality of information, Value of information, Information gathering.
3. Storage and retrieval of data: Physical and logical models of data, Logical data concepts, File organization, Data base organisation, Design of files, Data input methods.
4. Analysis of information system: Requirements of information system, Planning of information system, Information system goals, Objectives and architecture, Resource allocation, Role and task of system analyst, Tools used by system analyst.
5. Conceptual foundation: Decision making process, Phases in decision making, Concepts of decision making, Decision tables, Data flow diagrams.
6. Design of information system: Data base requirements, Support systems for planning control and decision making, Knowledge work, System development, System life cycle, Designing outputs, User interface, Systems specifications.
7. Typical examples of Information systems:
 - MIS for
 - a. Educational organisation
 - b. University
 - c. Stores, Accounting.
 - d. Banking, Hotel management
8. Control Audit and Security of information systems: Control in information systems audit of MIS, Testing of MIS and security of information.

Reference Books

1. Management information system, Davis and Alson, MGH.
2. Analysis and design of information system, V. Rajaraman, PHI.
3. The analysis, design and implementation of information system, Lucas H.C., MGH.
4. Advanced cases in MIS, Joseph A. Bray and Ellen F. Monk, Thomson Course technology.
5. Management Information System, W.S. Jawadekar, Second Edition, tata McGraw Hill publications, New Delhi

III. COMPILER CONSTRUCTION (IT-405-III)

1. **Introduction:** Language Processors, Structure of a compiler, applications of compiler technology.
2. **Lexical analysis:** Role of lexical analyzer, Input buffering, Specification & Recognition of tokens, Lexical Analyzer generator Lex, Design of lexical analyzer generator, Finite automata.
3. **Syntax analysis:** Introduction, CFG, Writing a grammar, Top-down parsing, Bottom-up parsing, Simple LR, More powerful LR parsers, Parser generators YACC.

4. **Syntax Directed Translation:** Syntax directed definitions, Evaluation orders of SDDs, Applications of SDTs, SDT schemes.

5. **Intermediate code generation:** Variants of syntax trees, Three address codes, Types and declarations, Type checking, Control flow, Backpatching.

6. **Code Generation:** Issues in design of code generator, The target language, Addresses in target code, Basic blocks of flow graphs, Optimizations of basic blocks, peephole optimization, Register allocation and assignment, Optimal code generation for expressions.

7. **Machine Independent optimization:** The principal sources of optimization, Introduction to data flow analysis, Foundations of data flow analysis, Loops in flow graphs.

References:

1. A. V. Aho, R. Sethi, & J. P. Ullman: Compilers: Principles, Techniques & Tools, Second Edition, Addison Wesley.

IV: OBJECT ORIENTED SYSTEM DEVELOPMENT (IT-405-IV)

1. Introduction: Object Oriented Systems Development, Object Basics, Inheritance, Object Relationship, Dynamic binding, - OOSD life cycle, Process, Analysis, Design, Prototyping, Implementation- Testing

2. Methodology and UML- Overview of Methodologies, OMT- Booch methodology, Jacobson Methodology, Unified approach, UML, Class Diagram, Dynamic modeling

3. Object Oriented Analysis: Identifying Use cases, Object Analysis Classification, Creation of classes-Noun phrase approach- Responsibilities-Collaborators- Object Relationship- Super-Sub class- Aggregation.

4. Object Oriented Design: OO Design Process, Corollaries, Designing Classes, Class visibility- Refining attributes- Methods- Access layers, OODBMS- Tables- Class mapping view layers- User Interface designing.

5. Software Quality: Quality Assurance testing—Inheritance and testing- Test plan Usability testing- User satisfaction- Testing.

REFERENCE BOOKS

1. Ali Bahrami- “ Object oriented System Development” Mcgraw Hill International Edition, 1999

2. Booch G. “ Object Oriented Analysis and Design” Addison Wesley Publishing Company 1994.

3. Rambaugh J. Blaha, M. Premerlani W. Eddy F and Loosen W. “ Object Oriented Modelling and Design”. PHI 1997.

IT-406: PROJECT I

The student should develop a project individually. The student can select any topic of their interest and carry out the work in the college laboratory under the supervision of the guide allotted by the department. The work may be related to hardware or software or combinational of hardware and software but should present an innovative idea in the latest field of Information technology, Computer Science or Electronics and telecommunication.

The students have to make a write up of about 50 pages of the project they have carried out in the semester. The project report should entail the concepts learned in Software Engineering.

The work carried out by the students for a period of six months will be evaluated by a panel of two examiners appointed by the university.

IT-407: INDUSTRIAL TRAINING

The students of TE (IT) have to undergo training in related industries of information Technology during second semester for a period of one month to one and half month. They will have to submit report of training in the form of the bound volume of their work they have carried out during their training period to the Department as soon as the First semester of their Final year starts.

The performance will be evaluated through a seminar given by the students before the committee appointed by the head of the department.

SEMESTER – II

IT-408: MULTIMEDIA TECHNOLOGY

(Total Credits: 5, Lecture/week:4, Practicals/week: 2)

1. Introduction to Multimedia.
2. Multimedia Data Representation.
Text, Audio and Speech, Images and Graphics, Video and Animation
3. Multimedia Data Compression.
Lossless Compression Algorithms, Lossy Compression Algorithms, Image Compression Standards, Video Compression Techniques, Audio Compression Techniques
4. Multimedia Database Systems.
Characteristics and Architecture of MMDBS, Logical Design, Physical Design (Storage Structure and Access methods, Indexing and Clustering, etc.)
5. Multimedia Indexing and Retrieval.
Computer Vision and Image Processing Techniques, Image and Video Indexing Techniques, Image and Video Retrieval Techniques
6. Multimedia Network Communications and Applications.
Quality of Multimedia Data Transmission, multimedia over IP, Multimedia over ATM Networks, Transport of MPEG 4 ,Media – on – Demand (MOD)

Reference:

1. Ze-Nian Li and Mark Drew, “Fundamental of Multimedia” Prentice Hall, 2004.
2. Fred Halsall, “Multimedia Communication Applications, Networks, Protocols and Standards” Pearson Education-2003.
3. P. Apers, H. Blanken and M. Houtsma (Eds) Springer Verlag, “ Multimedia Databases in Perspective” 1998.

IT-409: MOBILE AND WIRELESS COMMUNICATIONS

(Total Credits: 5, Lecture/week:4, Practical/week: 2)

1. **Introduction to Wireless Communication Systems:** - Evaluation of Mobile Radio Communications, Mobile Radio Systems around the World, Examples of wireless Communication systems, Trends in Cellular Radio & Personal Communications

2. Modern Wireless Communication systems:-Second Generation Cellular Networks, Third Generation Wireless Networks, Wireless Local Loop & LMDS, Wireless Local Area Networks, Blue Tooth & Personal Area Networks

3. The Cellular Concepts – System design fundamentals: Introduction, Frequency reuse, Channel Assignment Strategies, Handoff Strategies, Interference & System Capacity, Trunking & Grade of service, improving coverage & capacity in cellular systems

4. Wireless LANs:-Infrared Vs Radio Transmission, Infrastructure & ad-hoc n/ws, IEEE 802.11 HIPERLAN, blue tooth

5. Wireless WANs: -GSM & TDMA technology, CDMA technology, IS-95, IMT-2000, Mobile data n/ws

6. Wireless ATMs: -Motivation for WATM, WATM services, Reference Model, Functions, Radio Access layers, Handover, Location Management, Addressing, Mobile QOS, Access Point Control Protocol

7. Wireless Application Protocol:-Architecture, WDP, WTP, WSP, WML, WML Script, Wireless Telephone Applications, Examples Stacks with WAP.

Reference Books:

1. Wireless Communications: PRINCIPLES & PRACTISE, T.S.RAPPAPORT, Pearson Education
2. Mobile Communications, Jochen Schiller, Pearson Education
3. Principles Of Wireless Networks, Kaveh Pahlavan, Prashant Krishnamurthy, Pearson Education

Term Work:

The term work shall consist of a record of at least ten programs / assignments developed by the students to understand the concepts of the above syllabus.

Practical Examination:

Practical examination shall consist of an oral based on the above term work, and will be conducted by two examiners appointed by the university.

IT-410: E-COMMERCE

(Total Credits: 5, Lecture/week:4, Practicals/week: 2)

1. The revolution is just beginning

E-Commerce: The revolution is just beginning, Organizing Themes.

2. E-Commerce Business Models and Concepts

Business Models, B2C Business Models, B2B Business Models, Business Models in Emerging areas, How internet and web change business: strategies, structure and process.

3. Building a E-Commerce web site

A systematic approach, Choosing server software, Choosing hardware, Other site tools

4. Online Security and Payment Systems

E-commerce security environment, Security threats in e-commerce environment, Technology solutions, Management policies, business procedures and public laws, payment systems, e-commerce payment systems, Electronic billing presentment and payment, case study of Paypal.

5. E-Commerce Marketing Concepts

Consumer online: Internet audience and consumer behavior, Basic marketing concept, Internet marketing technologies, B2C and B2B marketing and branding strategies

6. Ethical, Social and Political Issues in E-Commerce

Understanding Ethical, social and political issues in E-commerce, Privacy and information rights, Intellectual property rights, Governance, Public safety and welfare.

7. Online Retailing and Services

The retail sector, Analyzing viability of online firms, E-commerce in action: e-tailing business models, common themes in online retailing, online financial services, online travel services, online career services.

8. Social networks, Auctions and Portals

Social networks and online communities, Online auctions, E-commerce portals.

Reference:

1. Kenneth Laudon, Carol Traver, "E-Commerce, Business, Technology, Society", Pearson Education, 4/e.
2. Kalakota and Whinston "E-commerce", PHI

IT-411: ELECTIVE-II

(Total Credits: 5, Lectures/week:4, Practicals/week: 2)

I: ADVANCED DATABASE MANAGEMENT SYSTEMS (IT-411-1)

1. Relational Databases

Relational Model, Database design principles, SQL, file organization, Overview of transactions, concurrency Control & recovery

2. Parallel Databases

Introduction, architecture, I/O parallelism, intra-query & inter-query parallelism, Interoperation & intra operation parallelism, and design of parallel systems

3. Distributed databases

Concepts, architecture, data fragmentation, replication, & allocation techniques for distributed database design, types of distributed database systems, Query processing, Distributed concurrency Control, Distributed recovery, an overview of client server architecture its relationships to distributed database, distributed database in oracle

4. Object oriented databases

Objects, Encapsulation, Inheritance, User Defined ADTs, Object Identity and Reference types, Database Design for ORDBMS, OODBMS, Comparison of RDBMS With OODBMS and ORDBMS

5. Advanced databases

Data Warehousing and Data Mining, Web Databases, Active & deductive Databases, Spatial & Temporal Databases, Mobile Databases, Main Memory databases, Multimedia databases, Personal databases

References:

- 1.Raghurama Krishnan and J.Gehrke, Database Management System, TMH 2003.
- 2.Silberschatz A., Korth H. F., & Sudarshan S., Database System Concepts, Tata McGraw Hill
- 3.Ullman J. D., Principles of Database Systems, Galgotia Publications.
- 4.Elmasri & Navathe, Fundamentals of Database Systems, Addison Wesley

II: REAL TIME SYSTEMS (IT-411-2)

- 1.Introduction to real time systems, reactive systems, interactive systems, transformational systems.
- 2.Classical approaches to mode types of systems, finite automata petri net based models, task based models, task based models, communicating process.
- 3.Introduction to estereel, notion of tick, programming examples, concurrency and preemption.
- 4.Introduction to concurrent programming, mutual exclusion problem, algorithm for mutual exclusion.
- 5.Introduction to lustre, programming examples, programming & verifying real time systems.
- 6.Formal methods, logic and models of real time, temporal logic for real time system, timed automata, Boolean automata, Synchronous automata.
- 7.Real time operating systems: scheduling, periodic/periodic, pre-emptive/non-pre-emptive, static/dynamic.
- 8.Real time hardware architecture: Bus arbitration, bus protocols, cache coherence protocols.

REFERENCE BOOKS:

1. Nicholas Halbachas Synchronous programming of reactive systems, Kluwer Academic Publishers, 1993.
2. Gerard Bery, Esterel Primer, available on Esterel web site, 1999

III: GEOGRAPHICAL INFORMATION SYSTEMS (IT-411-3)

1. Introduction, History, Operations, Map projections and coordinate systems
2. Vector data model and Vector data Inputs, Spatial Data Editing, Attribute data input and Management, raster Data
3. Data Display and Cartography, Data explorations,
4. Vector data Analysis, Raster data analysis
5. Terrain mapping and Analysis, Spatial Interpolation
6. GIS models and modelling, Regions
7. Network and Dynamic Segmentation.

Reference Books:

1. Geographic Information Systems by Kang-Tsung Chang, McGraw Hill International Edition

IV: ETHICS IN INFORMATION TECHNOLOGY (IT-411-4)

1. An Overview of Ethics
2. Ethics for IT Professionals and IT Users
3. Computer and Internet Crime
4. Privacy
5. Freedom of Expression
6. Intellectual Property
7. Software Development
8. Employer/Employee Issues
9. The Impact of Information Technology on the Quality of Life

Reference Books:

1. George Raynolds "Ethics in Information Technology" 2nd Edition, Cengage Publication

IT-412: WEB TECHNOLOGY LABORATORY

Students will have to study web-based architecture. They need to implements web based applications in JSP, ASP, and J2EE. . NET.

Term work

The term work shall consist of a record of at least ten programs / assignments developed by the students to understand the concepts of the above syllabus.

Practical Examination:

Practical examination shall consist of an oral based on the above term work, and will be conducted by two examiners appointed by the university.

IT-413: PROJECT WORK

The batch size for carrying out project in the second semester has to be of three (03) students. The student can select any topic of their interest and carry out the work in the college laboratory under the supervision of the guide allotted by the department. The work may be related to hardware or software or combinational of hardware and software but should present an innovative idea in the latest field of Information technology, Computer Science or Electronics and telecommunication.

The students have to make a write up of about 40 pages of the project they have carried out in the semester. The project report should entail the concepts learned in Software Engineering.

The work carried out by the students for a period of six months will be evaluated by a panel of two examiners appointed by the university.