B.E. COMPUTER ENGINEERING
FOURTH YEAR SEMISTER VIII

SUBJECT: SYSTEM SECURITY

Lectures: 4 Hrs per week **Practical: 2 Hrs per week**	**Theory: 100 Marks** **Term work: 25 Marks** **Oral: 25 Marks**

Objectives of the course: Learn about the threats in computer security. Understand what puts you at a risk and how to control it. Controlling a risk is not eliminating the risk but to bring it to a tolerable level.

Pre-requisites: Computer Networks, Operating system.

DETAILED SYLLABUS

1. **Introduction:** Security, Attacks, Computer criminals, Method of defense
2. **Cryptography:** Basic Cryptography: Classical Cryptosystems, Public key Cryptography, Cryptographic checksum, Key Management: Key exchange, Key generation, Cryptographic key infrastructure, Storing and revoking keys, Hash algorithm, Digital signature, Cipher Techniques: Problems, Stream and block ciphers: AES, DES, RC4.
3. **Program Security:** Secure programs, Non-malicious program errors, Viruses and other malicious code, Targeted malicious code, Controls against program threats
4. **Operating System Security:** Protected objects and methods of protection, Memory address protection, Control of access to general objects, File protection mechanism, Authentication: Authentication basics, Password, Challenge-response, Biometrics.
5. **Database Security:** Security requirements, Reliability and integrity, Sensitive data, Interface, Multilevel database, Proposals for multilevel security
6. **Security in Networks:** Threats in networks, Network security control, Firewalls, Intrusion detection systems, Secure e-mail, Networks and cryptography, Example protocols: PEM, SSL, IPsec
7. **Administrating Security:** Security planning, Risk analysis, Organizational security policies, Physical security.
8. **Legal, Privacy, and Ethical Issues in Computer Security: P**rotecting programs and data, Information and law, Rights of employees and employers, Software failures, Computer crime, Privacy, Ethical issues in computer society, Case studies of ethics

Books

Text Books:

1. Stallings**, "***Cryptography And Network Security: Principles and practice*"
2. C. P. Pfleeger, and S. L. Pfleeger, "*Security in Computing*", Pearson Education.
3. Matt Bishop, "*Computer Security: Art and Science*", Pearson Education.

References :

1. Kaufman, Perlman, Speciner, "*Network Security*"
2. Eric Maiwald, "*Network Security : A Beginner's Guide*", TMH
3. Bruce Schneier, "*Applied Cryptography*", John Wiley.
4. Macro Pistoia, "*Java network security* ", Pearson Education
5. Whitman, Mattord, "*Principles of information security",* Thomson

TERM WORK
1. Term work should consist of at least 10 practical experiments and two assignments covering the topics of the syllabus.
ORAL EXAMINATION
An oral examination is to be conducted based on the above syllabus.

B.E. COMPUTER ENGINEERING
FOURTH YEAR SEMISTER VIII

SUBJECT: DISTRIBUTED COMPUTING

Lectures: 4 Hrs per week **Practical: 2 Hrs per week**	**Theory: 100 Marks** **Term work: 25 Marks** **Oral: 25 marks**

Objective: This course aims to build concepts regarding the fundamental principles of distributed systems. The design issues and distributed operating system concepts are covered.

Pre-requisites: Operating Systems and Computer Networks

DETAILED SYLLABUS

1. **Introduction to Distributed System:** Goals, Hardware concepts, Software concepts, and Client-Server model. Examples of distributed systems.
2. **Communication:** Layered protocols, Remote procedures call, Remote object invocation, Message-oriented communication, Stream-oriented communication.
3. **Processes:** Threads, Clients, Servers, Code Migration, Software agent.
4. **Naming:** Naming entities, Locating mobile entities, Removing un-referenced entities.
5. **Synchronization:** Clock synchronization, Logical clocks, Global state, Election algorithms, Mutual exclusion, Distributed transactions.
6. **Consistency and Replication:** Introduction, Data centric consistency models, Client centric consistency models, Distribution protocols, Consistency protocols.
7. **Fault Tolerance:** Introduction, Process resilience, Reliable client server communication, Reliable group communication. Distributed commit, Recovery.
8. **Security:** Introduction, Secure channels, Access control, Security management.
9. **Distributed File System:** Sun network file system, CODA files system.
10. **Case Study:** CORBA, Distributed COM, Globe, Comparison of CORBA, DCOM, and Globe.

BOOKS

Text Books:

1. A. Taunenbaum, **"***Distributed Systems: Principles and Paradigms***"**
2. G. Coulouris, J. Dollimore, and T. Kindberg, "*Distributed Systems: Concepts and Design*", Pearson Education

References:

1. M. Singhal, N. Shivaratri, "*Advanced Concepts in Operating Systems*", TMH

TERM WORK

2. Term work should consist of at least 10 practical experiments and two assignments covering the topics of the syllabus.

ORAL EXAMINATION

An oral examination is to be conducted based on the above syllabus.

B.E. COMPUTER ENGINEERING
FOURTH YEAR SEMISTER VIII

SUBJECT: MULTIMEDIA SYSTEMS

Lectures: 4 Hrs per week **Practical: 2 Hrs per week**	**Theory: 100 Marks** **Term work: 25 Marks** **Oral: 25 marks**

Objectives of the course: This course teaches students to collect, and intelligently integrate multiple media on computers. Students learn the issues involved in capturing, compressing, processing, manipulating, searching, indexing, storing, and retrieving various kinds of continuous media in the text section.

Pre-requisites: Operating Systems, Computer Networks

DETAILED SYLLABUS

1. Multimedia Systems Introduction: Multimedia application, Multimedia system architecture, Evolving technologies for multimedia systems, defining objects for multimedia systems, Multimedia data interface standards
2. Compression and Decompression: Types of compression, Binary image compression schemes, Color, Gray scale, Still video image compression, Video image compression, Audio compression, Fractal compression, Data and File Format Standards: Rich text format, TIFF, RIFF, MIDI, JPEG, AVI, MPEG
3. Multimedia Input/Output Technologies: Key technologies issues, Pen input, Video and Image display system, Printout technology, Image scanners, Digital Voice and Audio, Full motion video
4. Storage and Retrieval Technologies: Magnetic media technology, Optical media, Hierarchical storage management, Cache management for storage system, Image and video databases: Indexing and Retrieval
5. Architectural and Telecommunications Considerations: Specialized computational processors, Memory systems, Multimedia board solutions, LAN/WAN connectivity, Multimedia transport across ATM networks, Multimedia across wireless, Distributed object models
6. Multimedia Networking: Multimedia networking applications, Streaming stored audio and video, RTP, Scheduling and policing mechanisms, Integrated services, RSVP
7. Multimedia Application Design: Multimedia application classes, Types of multimedia systems, Virtual reality design, Components of multimedia systems, Organizing multimedia databases, application workflow design issues, Distributed application design issues, Applications like Interactive, Television, Video Conferencing, Video-on-demand, Educational applications and authoring, Industrial applications, Multimedia archives and digital libraries
8. Multimedia Authoring and User Interface: Multimedia authoring systems, Hyper media application design considerations, User interface design, information access, Object display/playback issues
9. Hyper Media Messaging: Mobile messaging, Hyper media message components, Hypermedia linking and embedding, Creating hypermedia messages, integrated multimedia message standards, Integrated document management, The world-wide web, Open hypermedia systems, Content based navigation.
10. Distributed Multimedia Systems: Components of distributed multimedia systems, Distributed client server operations, Multimedia object servers, Multi-server network

topologies, Distributed multimedia database, Managing distributed objects

11. Multimedia System Design: Methodology and considerations, Multimedia systems design examples.

Books

Text Books:

1. Prabhat K. Andheigh, Kiran Thakrar, "*Multimedia Systems Design*", PHI John F,
2. Koegel Buford, "*Multimedia Systems*", Pearson Education.

References :

1. Free Halshall, "*Multimedia Communications*", Pearson Education.
2. R. Steimnetz, K. Nahrstedt, "*Multimedia Computing, Communications and Applications*", Pearson Education
3. K.R. Rao, D. Milovanovic, "*Multimedia Communication Systems: Techniques, Standards, and Networks*"
4. Subrahmanian, "*Multimedia Database Systems*", M. Kaufman
5. J. D. Gibson, "*Multimedia Communications: Directions and Innovations*", Academic Press, Hardcourt India
6. J.F. Kurose, K.W. Ross, "*Computer Networking*", Pearson Education

TERM WORK

3. Term work should consist of at least 10 practical experiments and two assignments covering the topics of the syllabus.

ORAL EXAMINATION

An oral examination is to be conducted based on the above syllabus.

B.E. COMPUTER ENGINEERING
FOURTH YEAR SEMISTER VIII

SUBJECT: DATA WAREHOUSING AND MINING
(ELECTIVE-II)

Lectures: 4 Hrs per week	**Theory: 100 Marks**
Practical: 2 Hrs per week	**Term work: 25 Marks**
	Oral Exam: 25 Marks

Objectives of the course: The data warehousing part of module aims to give students a good overview of the ideas and techniques which are behind recent development in the data warehousing and online analytical processing (OLAP) fields, in terms of data models, query language, conceptual design methodologies, and storage techniques. Data mining part of the model aims to motivate, define and characterize data mining as process; to motivate, define and characterize data mining applications.

Pre-requisites: DBMS

DETAILED SYLLABUS

Data Warehousing:

1. **Overview And Concepts:** Need for data warehousing, Basic elements of data warehousing, Trends in data warehousing.
2. **Planning And Requirements:** Project planning and management, Collecting the requirements.
3. **Architecture And Infrastructure:** Architectural components, Infrastructure and metadata.
4. **Data Design And Data Representation:** Principles of dimensional modeling, Dimensional modeling advanced topics, data extraction, transformation and loading, data quality.
5. **Information Access And Delivery:** Matching information to classes of users, OLAP in data warehouse, Data warehousing and the web.
6. **Implementation And Maintenance:** Physical design process, data warehouse deployment, growth and maintenance.

Data Mining:

1. **Introduction:** Basics of data mining, related concepts, Data mining techniques.
2. **Data Mining Algorithms:** Classification, Clustering, Association rules.
3. **Knowledge Discovery :** KDD Process
4. **Web Mining:** Web Content Mining, Web Structure Mining, Web Usage mining.
5. **Advanced Topics:** Spatial mining, Temporal mining.
6. **Visualisation :** Data generalization and summarization-based characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases
7. **Data Mining Primitives, Languages, and System Architectures:** Data mining primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems
8. **Application and Trends in Data Mining:** Applications, Systems products and research prototypes, Additional themes in data mining, Trends in data mining

BOOKS

Text Books:

1. Paulraj Ponnian, "*Data Warehousing Fundamentals*", John Wiley.
2. M.H. Dunham, "*Data Mining Introductory and Advanced Topics*", Pearson Education.
3. Han, Kamber, "*Data Mining Concepts and Techniques*", Morgan Kaufmann

References:

1. Ralph Kimball, "*The Data Warehouse Lifecycle toolkit*", John Wiley.
2. M Berry and G. Linoff, "*Mastering Data Mining*", John Wiley.
3. W.H. Inmon, "*Building the Data Warehouses*", Wiley Dreamtech.
4. R. Kimpall, "*The Data Warehouse Toolkit*", John Wiley.
5. E.G. Mallach, "*Decision Support and Data Warehouse systems*", TMH.

TERM WORK

7. Term work should consist of at least 10 practical experiments and two assignments covering the topics of the syllabus.

ORAL EXAMINATION

An oral examination is to be conducted based on the above syllabus.

B.E. COMPUTER ENGINEERING
FOURTH YEAR SEMISTER VIII

SUBJECT: PROJECT-B

Tutorial: 6 Hrs per week	**Term Work: 50 Marks** **Oral: 50 Marks**

GUIDELINES

1. Project-B exam be conducted by two examiners appointed by university. Students have to give demonstration and seminar on the project-B for the term work marks. All the students of the class must attend all the seminars. Seminars should be conducted continuously for couple of days.
2. Project –B should contain:
   - Introduction and motivation, Problem statement, Requirement analysis, Project design, Implementation details, Technologies used, Test cases, Project time line, Task distribution, References, and Appendix consisting of users manual, technical reference manual.
   - CD containing: Project documentation, Implementation code, Required utilities, Software's and Manuals.
   - Every student must prepare well formatted, printed and hard bound report.
3. Internal guide has to interact at least once in fortnight and maintain the progress and attendance report during the term.
4. Make sure that external project guides are BE graduates.
5. Convener should make sure that external examiners are appointed from the list as per appropriate technical area.