

SEMESTER VII

(Applicable to the students admitted from the Academic year 2006 – 2007 onwards)

Code No.	Course Title	L	T	P	M
THEORY					
1	Environmental Science and Engineering (Common for CSE & IT)	4	0	0	100
2	Internet Programming	4	0	0	100
3	Object Oriented Analysis and Design (Common for CSE & IT)	4	0	0	100
4	Cryptography and Network security	4	0	0	100
5	Elective II	4	0	0	100
6	Elective III	4	0	0	100
PRACTICAL					
1	Case Tools Lab (Common for CSE & IT)	0	0	3	100
2	Internet Programming Lab	0	0	3	100

SEMESTER VII

INTERNET PROGRAMMING

AIM

To explain Internet Programming concepts and related programming and scripting languages.

OBJECTIVES

To describe basic Internet Protocols.

Explain JAVA and HTML tools for Internet programming.

Describe scripting languages – Java Script.

Explain dynamic HTML programming.

Explain Server Side Programming tools.

UNIT I BASIC NETWORK AND WEB CONCEPTS 9

Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML.

UNIT II JAVA PROGRAMMING

9

Java basics – I/O streaming – files – Looking up Internet Address - Socket programming – client/server programs – E-mail client – SMTP - POP3 programs – web page retrieval – protocol handlers – content handlers - applets – image handling - Remote Method Invocation.

UNIT III SCRIPTING LANGUAGES 9

HTML – forms – frames – tables – web page design - JavaScript introduction – control structures – functions – arrays – objects – simple web applications

UNIT IV DYNAMIC HTML 9

Dynamic HTML – introduction – cascading style sheets – object model and collections – event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data

UNIT V SERVER SIDE PROGRAMMING 9

Servlets – deployment of simple servlets – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications.

TOTAL : 45

TEXT BOOKS

Deitel, Deitel and Nieto, “Internet and World Wide Web – How to program”, Pearson Education Publishers, 2000.

Elliotte Rusty Harold, “Java Network Programming”, O’Reilly Publishers, 2002

REFERENCES

R. Krishnamoorthy & S. Prabhu, “Internet and Java Programming”, New Age International Publishers, 2004.

Thomno A. Powell, “The Complete Reference HTML and XHTML”, fourth edition, Tata McGraw Hill, 2003.

Naughton, “The Complete Reference – Java2”, Tata McGraw-Hill, 3rd edition, 1999.

3. Hans-Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, "UML Toolkit", OMG Press Wiley Publishing Inc., 2004.

SEMESTER VII

CRYPTOGRAPHY AND NETWORK SECURITY

AIM

To understand the principles of encryption algorithms; conventional and public key cryptography. To have a detailed knowledge about authentication, hash functions and application level security mechanisms.

OBJECTIVES

- To know the methods of conventional encryption.
- To understand the concepts of public key encryption and number theory
- To understand authentication and Hash functions.
- To know the network security tools and applications.
- To understand the system level security used.

UNIT I INTRODUCTION 10

OSI Security Architecture - Classical Encryption techniques – Cipher Principles – Data Encryption Standard – Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES – AES Cipher – Triple DES – Placement of Encryption Function – Traffic Confidentiality

UNIT II PUBLIC KEY CRYPTOGRAPHY 10

Key Management - Diffie-Hellman key Exchange – Elliptic Curve Architecture and Cryptography - Introduction to Number Theory – Confidentiality using Symmetric Encryption – Public Key Cryptography and RSA.

UNIT III AUTHENTICATION AND HASH FUNCTION 9

Authentication requirements – Authentication functions – Message Authentication Codes – Hash Functions – Security of Hash Functions and MACs – MD5 message Digest algorithm - Secure Hash Algorithm – RIPEMD – HMAC Digital Signatures – Authentication Protocols – Digital Signature Standard

UNIT IV NETWORK SECURITY 8

Authentication Applications: Kerberos – X.509 Authentication Service – Electronic Mail Security – PGP – S/MIME - IP Security – Web Security.

UNIT V SYSTEM LEVEL SECURITY 8

Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems.

TUTORIAL 15

TOTAL : 60

TEXT BOOK

1. William Stallings, “Cryptography And Network Security – Principles and Practices”, Prentice Hall of India, Third Edition, 2003.

REFERENCES

1. Atul Kahate, “Cryptography and Network Security”, Tata McGraw-Hill, 2003.
2. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2001.
3. Charles B. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Third Edition, Pearson Education, 2003.

CASE TOOLS LAB
(Common to CSE & IT)

1. Prepare the following documents for two or three of the experiments listed below and develop the software engineering methodology.

1. Program Analysis and Project Planning.
Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
3. Software requirement Analysis
Describe the individual Phases / Modules of the project, Identify deliverables.
4. Data Modeling
Use work products – Data dictionary, Use diagrams and activity diagrams, build and test lass diagrams, Sequence diagrams and add interface to class diagrams.
5. Software Development and Debugging
6. Software Testing
Prepare test plan, perform validation testing, Coverage analysis, memory leaks, develop test case hierarchy, Site check and Site monitor.

SUGGESTED LIST OF APPLICATIONS

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance
9. Real-Time Scheduler
10. Remote Procedure Call Implementation

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8. INTERNET PROGRAMMING LABORATORY

LIST OF EXPERIMENTS

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout
3. Write programs in Java to create applets incorporating the following features:
 - Create a color palette with matrix of buttons
 - Set background and foreground of the control text area by selecting a color from color palette.
 - In order to select Foreground or background use check box control as radio buttons
 - To set background images
4. Write programs in Java to do the following.
 - Set the URL of another server.
 - Download the homepage of the server.
 - Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following:
 - HTTP request
 - FTP
 - SMTP
 - POP3
6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.
7. Write programs in Java using Servlets:
 - To invoke servlets from HTML forms
 - To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets
 - for conducting on-line examination.
 - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
9. Create a web page with the following using HTML
 - i) To embed a map in a web page
 - ii) To fix the hot spots in that map
 - iii) Show all the related information when the hot spots are clicked.
10. Create a web page with the following.
 - i) Cascading style sheets.
 - ii) Embedded style sheets.
 - iii) Inline style sheets.
 - iv) Use our college information for the web pages.

ELECTIVE

SEMESTER VII

ADVANCED OPERATING SYSTEMS

AIM

To understand the principles in the design of modern operating systems, distributed and multiprocessor operating systems

OBJECTIVES

- To get a comprehensive knowledge of the architecture of distributed systems.
- To understand the deadlock and shared memory issues and their solutions in distributed environments.
- To know the security issues and protection mechanisms for distributed environments.
- To get a knowledge of multiprocessor operating system and database operating systems.

UNIT I

9

Architectures of Distributed Systems - System Architecture types - issues in distributed operating systems - communication networks – communication primitives. Theoretical Foundations - inherent limitations of a distributed system – lamp ports logical clocks – vector clocks – casual ordering of messages – global state – cuts of a distributed computation – termination detection. Distributed Mutual Exclusion – introduction – the classification of mutual exclusion and associated algorithms – a comparative performance analysis.

UNIT II

9

Distributed Deadlock Detection -Introduction - deadlock handling strategies in distributed systems – issues in deadlock detection and resolution – control organizations for distributed deadlock detection – centralized and distributed deadlock detection algorithms –hierarchical deadlock detection algorithms. Agreement protocols – introduction-the system model, a classification of agreement problems, solutions to the Byzantine agreement problem, applications of agreement algorithms. Distributed resource management: introduction-architecture – mechanism for building distributed file systems – design issues – log structured file systems.

UNIT III

9

Distributed shared memory-Architecture– algorithms for implementing DSM – memory coherence and protocols – design issues. Distributed Scheduling – introduction – issues in load distributing – components of a load distributing algorithm – stability – load distributing algorithm – performance comparison – selecting a suitable load sharing algorithm – requirements for load distributing -task migration and associated issues. Failure Recovery and Fault tolerance: introduction– basic concepts – classification of failures – backward and forward error recovery, backward error recovery- recovery in concurrent systems – consistent set of check points – synchronous and asynchronous check pointing and recovery – check pointing for distributed database systems- recovery in replicated distributed databases.

UNIT IV

9

Protection and security -preliminaries, the access matrix model and its implementations.-safety in matrix model- advanced models of protection. Data security – cryptography: Model of cryptography, conventional cryptography- modern cryptography, private key cryptography, data encryption standard- public key cryptography – multiple encryption – authentication in distributed systems.

UNIT-V

9

Multiprocessor operating systems - basic multiprocessor system architectures – inter connection networks for multiprocessor systems – caching – hypercube architecture. Multiprocessor Operating System - structures of multiprocessor operating system, operating system design issues- threads- process synchronization and scheduling.

Database Operating systems :Introduction- requirements of a database operating system Concurrency control : theoretical aspects – introduction, database systems – a concurrency control model of database systems- the problem of concurrency control – serializability theory- distributed database systems, concurrency control algorithms – introduction, basic synchronization primitives, lock based algorithms- timestamp based algorithms, optimistic algorithms – concurrency control algorithms, data replication.

TOTAL : 45

TEXT BOOK

1. Mukesh Singhal, Niranjan G.Shivaratri, "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", TMH, 2001

REFERENCES

1. Andrew S.Tanenbaum, "Modern operating system", PHI, 2003
2. Pradeep K.Sinha, "Distributed operating system-Concepts and design", PHI, 2003.
3. Andrew S.Tanenbaum, "Distributed operating system", Pearson education, 2003

REAL TIME SYSTEMS

AIM

To understand the basic concepts, design and integration of Real Time Systems.

OBJECTIVES

- To know about the specification and design techniques of a Real Time System.
- To understand about real time task communication and synchronization
- To have a vast knowledge of queuing models and Real Time System integration.

UNIT I BASIC REAL TIME CONCEPTS 9

Basic computer architecture – some terminology - real time design issues – example real time systems – input and output – other devices – language features.

UNIT II REAL TIME SPECIFICATION AND DESIGN TECHNIQUES 9

Natural languages – mathematical specification – flow charts – structured charts – pseudocode and programming design languages – finite state automata – data flow diagrams – petri nets – Warnier Orr notation – state charts – polled loop systems – phase / state driven code – coroutines – interrupt – driven systems – foreground/background system – full featured real time operating systems

UNIT III INTERTASK COMMUNICATION AND SYNCHRONIZATION 9

Buffering data – mailboxes – critical regions – semaphores – deadlock – process stack management – dynamic allocation – static schemes – response time calculation – interrupt latency – time loading and its measurement – scheduling is NP complete – reducing response times and time loading – analysis of memory requirements – reducing memory loading – I/O performance

UNIT IV QUEUING MODELS 9

Probability functions – discrete- basic buffering calculation – classical queuing theory – little's law – erlong's formula – faults, failures, bugs and effects – reliability-testing – fault tolerance – classification of architecture – distributing systems – Non Von Neuman architecture

UNIT V HARDWARE/SOFTWARE INTEGRATION 9

Goals of real time system integration – tools - methodology -software Heinsberg uncertainty principle – real time applications

TOTAL : 45

TEXT BOOK

1. Philip A.Laplante, “Real time system design and analysis – an engineer's handbook

REFERENCES

1. C.M.Krishna and Kang G Shin, "Real time systems", TMH, 1997
2. Stuart Bennelt, "Real time computer control – and introduction", Pearson education, 2003.
3. Allen Burns, Andy Wellings, “Real Time Systems and Programming Languages”, Pearson Education, 2003.

TCP / IP DESIGN AND IMPLEMENTATION

AIM

Having learned about computer networks, this subject helps the students to learn TCP/IP protocol indepth considering design alternatives and implementation techniques.

OBJECTIVES

- To understand the internals of the TCP/IP protocols
- To understand how TCP/IP is actually implemented
- To understand the interaction among the protocols in a protocol stack.

UNIT I INTRODUCTION 9

Internetworking concepts and architectural model- classful Internet address – CIDR-Subnetting and Supernetting –ARP- RARP- IP – IP Routing –ICMP – Ipv6

UNIT II TCP

9

Services – header – connection establishment and termination- interactive data flow- bulk data flow- timeout and retransmission – persist timer - keepalive timer- futures and performance

UNIT III IP IMPLEMENTATION

9

IP global software organization – routing table- routing algorithms-fragmentation and reassembly- error processing (ICMP) –Multicast Processing (IGMP)

UNIT IV TCP IMPLEMENTATION I 9

Data structure and input processing – transmission control blocks- segment format- comparison-finite state machine implementation-Output processing- mutual exclusion-computing the TCP data length

UNIT V TCP IMPLEMENTATION II 9

Timers-events and messages- timer process- deleting and inserting timer event- flow control and adaptive retransmission-congestion avoidance and control – urgent data processing and push function.

TOTAL : 45

TEXT BOOKS

1. Douglas E.Comer – “Internetworking with TCP/IP Principles, Protocols and Architecture”, Vol. 1 & 2 fourth edition, Pearson Education Asia, 2003
(Unit I in Comer Vol. I, Units II, IV & V – Comer Vol. II)
2. W.Richard Stevens “TCP/IP illustrated” Volume 1 Pearson Education, 2003 (Unit II)

REFERENCES

1. TCP/IP protocol suite, Forouzan, 2nd edition, TMH, 2003
2. W.Richard Stevens “TCP/IP illustrated” Volume 2 Pearson Education 2003.

SYSTEM MODELING AND SIMULATION

AIM

To build knowledge on system modeling and system study on various applications.

OBJECTIVES

- To provide a strong foundation on concept of simulation, and modeling.
- To understand the techniques of random number generations.
- To understand the techniques of testing randomness.
- To design simulation models for various case studies like inventory, traffic flow networks, etc.
- To practice on simulation tools and impart knowledge on building simulation systems.

1. INTRODUCTION 8

Systems, modeling, general systems theory, Concept of simulation, Simulation as a decision making tool, types of simulation.

2. RANDOM NUMBERS 9

Pseudo random numbers, methods of generating random variables, discrete and continuous distributions, testing of random numbers.

3. DESIGN OF SIMULATION EXPERIMENTS 10

Problem formulation, data collection and reduction, time flow mechanism, key variables, logic flow chart, starting condition, run size, experimental design consideration, output analysis and interpretation validation.

4. SIMULATION LANGUAGES 8

Comparison and selection of simulation languages, study of anyone simulation language.

5. CASE STUDIES 10

Development of simulation models using simulation language studied for systems like queuing systems, Production systems, Inventory systems, maintenance and replacement systems and Investment analysis.

TOTAL : 45

TEXT BOOKS

1. Geoffrey Gordon, "System Simulation", 2nd Edition, Prentice Hall, India, 2002.
2. Narsingh Deo, "System Simulation with Digital Computer", Prentice Hall, India, 2001.

REFERENCES

1. Jerry Banks and John S.Carson, Barry L. Nelson, David M.Nicol, "Discrete Event System Simulation", 3rd Edition, Prentice Hall, India, 2002.
2. Shannon, R.E. Systems simulation, The art and science, Prentice Hall, 1975.
3. Thomas J. Schriber, Simulation using GPSS, John Wiley, 1991.

TEXT BOOK

2. William Stallings, "Cryptography And Network Security – Principles and Practices", Prentice Hall of India, Third Edition, 2003.

REFERENCES

4. Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003.
5. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2001.
6. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2003.

NATURAL LANGUAGE PROCESSING

AIM

The aim is to expose the students to the basic principles of language processing and typical applications of natural language processing systems

OBJECTIVE

- To provide a general introduction including the use of state automata for language processing
- To provide the fundamentals of syntax including a basic parse
- To explain advanced feature like feature structures and realistic parsing methodologies
- To explain basic concepts of remotes processing
- To give details about a typical natural language processing applications

UNIT I INTRODUCTION 6

Introduction: Knowledge in speech and language processing – Ambiguity – Models and Algorithms – Language, Thought and Understanding. Regular Expressions and automata: Regular expressions – Finite-State automata. Morphology and Finite-State Transducers: Survey of English morphology – Finite-State Morphological parsing – Combining FST lexicon and rules – Lexicon-Free FSTs: The porter stammer – Human morphological processing

UNIT II SYNTAX

10

Word classes and part-of-speech tagging: English word classes – Tagsets for English – Part-of-speech tagging – Rule-based part-of-speech tagging – Stochastic part-of-speech tagging – Transformation-based tagging – Other issues. Context-Free Grammars for English: Constituency – Context-Free rules and trees – Sentence-level constructions – The noun phrase – Coordination – Agreement – The verb phrase and sub categorization – Auxiliaries – Spoken language syntax – Grammars equivalence and normal form – Finite-State and Context-Free grammars – Grammars and human processing. Parsing with Context-Free Grammars: Parsing as search – A Basic Top-Down parser – Problems with the basic Top-Down parser – The early algorithm – Finite-State parsing methods.

UNIT III ADVANCED FEATURES AND SYNTAX 11

Features and Unification: Feature structures – Unification of feature structures – Features structures in the grammar – Implementing unification – Parsing with unification constraints – Types and Inheritance. Lexicalized and Probabilistic Parsing: Probabilistic context-free grammar – problems with PCFGs – Probabilistic lexicalized CFGs – Dependency Grammars – Human parsing.

UNIT IV SEMANTIC 10

Representing Meaning: Computational desiderata for representations – Meaning structure of language – First order predicate calculus – Some linguistically relevant concepts – Related representational approaches – Alternative approaches to meaning. Semantic Analysis: Syntax-Driven semantic analysis – Attachments for a fragment of English – Integrating semantic analysis into the early parser – Idioms and compositionality – Robust semantic analysis. Lexical semantics: relational among lexemes and their senses – WordNet: A database of lexical relations – The Internal structure of words – Creativity and the lexicon.

UNIT V**APPLICATIONS****8**

Word Sense Disambiguation and Information Retrieval: Selectional restriction-based disambiguation – Robust word sense disambiguation – Information retrieval – other information retrieval tasks. Natural Language Generation: Introduction to language generation – Architecture for generation – Surface realization – Discourse planning – Other issues. Machine Translation: Language similarities and differences – The transfer metaphor – The interlingua idea: Using meaning – Direct translation – Using statistical techniques – Usability and system development.

TOTAL : 45**TEXT BOOK**

1. Daniel Jurafsky & James H.Martin, “ Speech and Language Processing”, Pearson Education (Singapore) Pte. Ltd., 2002.

REFERENCE

1. James Allen, “Natural Language Understanding”, Pearson Education, 2003.

INFORMATION SECURITY

AIM

To study the critical need for ensuring Information Security in Organizations

OBJECTIVES

1. To understand the basics of Information Security
2. To know the legal, ethical and professional issues in Information Security
3. To know the aspects of risk management
4. To become aware of various standards in this area
5. To know the technological aspects of Information Security

UNIT I INTRODUCTION 9

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II SECURITY INVESTIGATION 9

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III SECURITY ANALYSIS 9

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV LOGICAL DESIGN 9

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V PHYSICAL DESIGN

9

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

TOTAL : 45

TEXT BOOK

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003

REFERENCES

1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
3. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.

USER INTERFACE DESIGN

AIM

To implement the basics and in-depth knowledge about UID. It enables the students to take up the design the user interface, design, menu creation and windows creation and connection between menu and windows.

OBJECTIVES

- To study the concept of menus, windows, interfaces.
- To study about business functions.
- To study the characteristics and components of windows.
- To study the various controls for the windows.
- To study about various problems in windows design with color, text, graphics.
- To study the testing methods

UNIT I

8

Introduction-Importance-Human-Computer interface-characteristics of graphics interface-Direct manipulation graphical system - web user interface-popularity-characteristic & principles.

UNIT II

10

User interface design process- obstacles-usability-human characteristics in design - Human interaction speed-business functions-requirement analysis-Direct-Indirect methods-basic business functions-Design standards-system timings - Human consideration in screen design - structures of menus - functions of menus-contents of menu-formatting -phrasing the menu - selecting menu choice-navigating menus-graphical menus.

UNIT III

9

Windows: Characteristics-components-presentation styles-types-managements-organizations-operations-web systems-device-based controls: characteristics-Screen -based controls: operate control - text boxes-selection control-combination control-custom control-presentation control.

UNIT IV

9

Text for web pages - effective feedback-guidance & assistance-Internationalization-accessibility-Icons-Image-Multimedia -coloring.

UNIT V

9

Windows layout-test :prototypes - kinds of tests - retest - Information search - visualization - Hypermedia - www - Software tools.

TOTAL : 45

TEXT BOOK

1. Wilbent. O. Galitz ,“The Essential Guide to User Interface Design”, John Wiley& Sons, 2001.

REFERENCES

1. Ben Sheiderman, “Design the User Interface”, Pearson Education, 1998.

2. Alan Cooper, "The Essential of User Interface Design", Wiley – Dream Tech Ltd., 2002.

GRAPH THEORY

AIM

To provide fundamental ideas on graph theory required for the study of Computer Science.

OBJECTIVES

- Understand basic notions of Graph Theory
- Knowing Fundamental Theorems in Graph Theory
- Study of algorithmic Graph Theory

UNIT I

9

Graphs – Introduction – Isomorphism – Sub graphs – Walks, Paths, Circuits – Connectedness – Components – Euler Graphs – Hamiltonian Paths and Circuits – Trees – Properties of trees – Distance and Centers in Tree – Rooted and Binary Trees.

UNIT II

9

Spanning trees – Fundamental Circuits – Spanning Trees in a Weighted Graph – Cut Sets – Properties of Cut Set – All Cut Sets – Fundamental Circuits and Cut Sets – Connectivity and Separability – Network flows – 1-Isomorphism – 2-Isomorphism – Combinational and Geometric Graphs – Planer Graphs – Different Representation of a Planer Graph.

UNIT III

9

Incidence matrix – Submatrices – Circuit Matrix – Path Matrix – Adjacency Matrix – Chromatic Number – Chromatic partitioning – Chromatic polynomial - Matching - Covering – Four Color Problem – Directed Graphs – Types of Directed Graphs – Digraphs and Binary Relations – Directed Paths and Connectedness – Euler Graphs – Adjacency Matrix of a Digraph.

UNIT IV

9

Algorithms: Connectedness and Components – Spanning tree – Finding all Spanning Trees of a Graph – Set of Fundamental Circuits – Cut Vertices and Separability – Directed Circuits.

UNIT V

9

Algorithms: Shortest Path Algorithm – DFS – Planarity Testing – Isomorphism

TOTAL : 45

TEXT BOOK

1. Narsingh Deo, “Graph Theory: With Application to Engineering and Computer Science”, PHI, 2003.

REFERENCE

1. R.J. Wilson, “Introduction to Graph Theory”, Fourth Edition, Pearson Education, 2003.

TOTAL QUALITY MANAGEMENT

OBJECTIVE

- To understand the Total Quality Management concept and principles and the various tools available to achieve Total Quality Management.
- To understand the statistical approach for quality control.
- To create an awareness about the ISO and QS certification process and its need for the industries.

1. INTRODUCTION 9

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis

Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical

Review, Principles of TQM, Leadership – Concepts, Role of Senior Management,

Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to

TQM Implementation.

2. TQM PRINCIPLES 9

Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement – Juran Trilogy, PDSA Cycle, 5S, Kaizen, Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure.

9

3. STATISTICAL PROCESS CONTROL (SPC)

The seven tools of quality, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

4. TQM TOOLS 9

Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.

5. QUALITY SYSTEMS 9

Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 – Concept, Requirements and Benefits.

TOTAL : 45

TEXT BOOK

1. Dale H.Besterfiled, et al., Total Quality Management, Pearson Education, Inc. 2003. (Indian reprint 2004). ISBN 81-297-0260-6.

REFERENCES

1. James R.Evans & William M.Lidsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. "Total Quality Management, McGraw-Hill, 1991.
3. Oakland.J.S. "Total Quality Management Butterworth – Hcinemann Ltd., Oxford. 1989.
4. Narayana V. and Sreenivasan, N.S. Quality Management – Concepts and Tasks, New Age International 1996.
5. Zeiri. "Total Quality Management for Engineers Wood Head Publishers, 1991.

