

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR.**

B. TECH. COMPUTER SCIENCE AND ENGINEERING

III Year

I Semester

COURSE STRUCTURE

Code	Subject	T	P	C
	Formal Languages and Automata Theory		4+1*	- 4
	Software Testing Methodologies		4+1*	- 4
	Computer Graphics		4+1*	- 4
	Microprocessors and Interfacing		4+1*	- 4
	Data Communication Systems		4+1*	- 4
	Design and Analysis of Algorithms		4+1*	- 4
	Advanced English Communication Skills Lab		-	3 2
	Microprocessors and Interfacing Lab		-	3 2
	Total		30	6 28

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B. TECH. COMPUTER SCIENCE AND ENGINEERING

IV Year

I Semester

COURSE STRUCTURE

Code	Subject	T	P	C
	Network Programming		4+1*	- 4
	Web Technologies		4+1*	- 4
	Data Warehousing and Data Mining		4+1*	- 4
	Advanced Computer Architecture		4+1*	- 4
	ELECTIVE – I :		4+1*	- 4
	Embedded Systems			
	Mobile Computing			
	Multimedia and Application Development			
	ELECTIVE – II :		4+1*	- 4
	Software Project Management			
	Advanced Computing Concepts			
	Network Management Systems			
	Network Programming Lab		-	3 2
	Web Technologies Lab		-	3 2
	Total		30	6 28

NOTE: All University Examinations (Theory and Practical) are of 3 hours duration.

* : Tutorials

T : Theory periods per week P: Practical /Drawing Periods per week

C : Total Credits for the subject

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III Year B.Tech. CSE -I Sem

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4+1*	0	4

FORMAL LANGUAGES AND AUTOMATA THEORY

The purpose of this course is to acquaint the student with an overview of the theoretical foundations of computer science from the perspective of formal languages.

- Classify machines by their power to recognize languages.
- Employ finite state machines to solve problems in computing.
- Explain deterministic and non-deterministic machines.
- Comprehend the hierarchy of problems arising in the computer sciences.

UNIT I :

Fundamentals : Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

UNIT II :

Finite Automata : NFA with $\hat{\lambda}$ transitions - Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without $\hat{\lambda}$ transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.

UNIT III :

Regular Languages : Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

UNIT IV :

Grammar Formalism : Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms.

Right most and leftmost derivation of strings.

UNIT V :

Context Free Grammars : Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

UNIT VI :

Push Down Automata : Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. (Proofs not required). Introduction to DCFL and DPDA.

UNIT VII :

Turing Machine : Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required).

UNIT VIII

Computability Theory : Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

TEXT BOOKS :

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D. Pearson Education
2. Introduction to Theory of Computation –Sipser 2nd edition Thomson

REFERENCES :

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation ,John C Martin, TMH
3. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
- 4 Theory of Computer Science – Automata languages and computation -Mishra and Chandrashekar, 2nd edition, PHI

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SOFTWARE TESTING METHODOLOGIES

UNIT I :

Introduction : Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

UNIT II :

Flow graphs and Path testing : Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT III :

Transaction Flow Testing : Transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT IV :

Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT V :

Paths, Path products and Regular expressions : Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

UNIT VI :

Logic Based Testing : Overview, decision tables, path expressions, kv charts, specifications.

UNIT VII :

State, State Graphs and Transition testing : State graphs, good & bad state graphs, state testing, Testability tips.

UNIT VIII :

Graph Matrices and Application : Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

Usage of JMeter and Winrunner tools for functional / Regression testing, creation of test script for unattended testing, synchronization of test case, Rapid testing, Performance testing of a data base application and HTTP connection for website access.

TEXT BOOKS :

1. Software Testing techniques - Baris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

REFERENCES :

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing – Meyers, John Wiley.

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COMPUTER GRAPHICS

UNIT I :

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

(p.nos 22-90 of text book-1).

UNIT II :

Output primitives : Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms (p.nos 103-123,137- 145,147-150,164-171 of text book-1, p.nos. 72-99 of text book-2).

UNIT III :

2-D geometrical transforms : Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. (p.nos 204-227 of text book-1).

UNIT IV :

2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm (p.nos 237-249,257-261 of text book -1, p.nos. 111-126 of text book-2).

UNIT V :

3-D object representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods. (p.nos 324-331,340-342, 347-364, 516-531, 542-546 of text book-1, p.nos 473-529,721-739 of text book-2).

UNIT VI :

3-D Geometric transformations : Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D viewing : Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping (p.nos 427-443, 452-481 of text book -1).

UNIT VII :

Visible surface detection methods : Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods (p.nos 489-505 of text book -1, Chapter 15 of of text book-2).

UNIT VIII :

Computer animation : Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications. (p.nos 604-616 of text book -1, chapter 21 of text book-2).

TEXT BOOKS :

1. "Computer Graphics *C version*", Donald Hearn and M.Pauline Baker, Pearson Education.
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCES :

1. "Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
2. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
4. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

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MICROPROCESSORS AND INTERFACING

UNIT-I

An over view of 8085, Architecture of 8086 Microprocessor. Special functions of General purpose registers. 8086 flag register and function of 8086 Flags. Addressing modes of 8086. Instruction set of 8086. Assembler directives, simple programs, procedures, and macros.

UNIT-II

Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III

Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram. Memory interfacing to 8086 (Static RAM & EPROM). Need for DMA. DMA data transfer Method. Interfacing with 8237/8257.

UNIT-IV

8255 PPI – various modes of operation and interfacing to 8086. Interfacing Keyboard, Displays, 8279 Stepper Motor and actuators. D/A and A/D converter interfacing.

UNIT-V

Interrupt structure of 8086. Vector interrupt table. Interrupt service routines. Introduction to DOS and BIOS interrupts. 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance.

UNIT-VI

Serial data transfer schemes. Asynchronous and Synchronous data transfer schemes. 8251 USART architecture and interfacing. TTL to RS 232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to High-speed serial communications standards, USB.

UNIT-VII

Advanced Micro Processors - Introduction to 80286, Salient Features of 80386, Real and Protected Mode Segmentation & Paging, Salient Features of Pentium, Branch Prediction, Overview of RISC Processors.

UNIT-VIII

8051 Microcontroller Architecture, Register set of 8051, Modes of timer operation, Serial port operation, Interrupt structure of 8051, Memory and I/O interfacing of 8051.

TEXT BOOKS :

1. Advanced microprocessor and Peripherals - A.K.Ray and K.M.Bhurchandi, TMH, 2000.
2. Micro Controllers – Deshmukh, Tata McGraw Hill Edition.

REFERENCES :

1. Micro Processors & Interfacing – Douglas U. Hall, 2007.
2. The 8088 and 8086 Micro Processors – PHI, 4th Edition, 2003.
3. Micro Computer System 8086/8088 Family Architecture, Programming and Design - By Liu and GA Gibson, PHI, 2nd Ed.,

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DATA COMMUNICATION SYSTEMS

Unit I :

INTRODUCTION TO DATA COMMUNICATIONS AND NETWORKING: Standards Organizations for Data Communications, Layered Network Architecture, Open Systems Interconnection, Data Communications Circuits, Serial and parallel Data Transmission, Data communications Circuit Arrangements, Data communications Networks, Alternate Protocol Suites.

SIGNALS, NOISE, MODULATION, AND DEMODULATION :

Signal Analysis, Electrical Noise and Signal-to-Noise Ratio, Analog Modulation Systems, Information Capacity, Bits, Bit Rate, Baud, and *M*-ary Encoding, Digital Modulation.

Unit II :

METALLIC CABLE TRANSMISSION MEDIA :

Metallic Transmission Lines, Transverse Electromagnetic Waves, Characteristics of Electromagnetic Waves, Transmission Line Classifications, Metallic Transmission Line Types, Metallic Transmission Line Equivalent Circuit, Wave Propagation on Metallic Transmission Lines, Metallic Transmission Line Losses.

OPTICAL FIBER TRANSMISSION MEDIA :

Advantages of Optical Fiber Cables, Disadvantages of Optical Fiber Cables, Electromagnetic spectrum, Optical Fiber Communications System Block Diagram, Optical Fiber construction, The Physics of Light, Velocity of Propagation, Propagation of Light Through an Optical fiber Cable, Optical Fiber Modes and Classifications, Optical Fiber Comparison, Losses in Optical Fiber Cables, Light sources, Light Detectors, Lasers.

Unit III :

DIGITAL TRANSMISSION :

Pulse Modulation, Pulse code Modulation, Dynamic Range, Signal Voltage –to-Quantization Noise Voltage Ration, Linear Versus Nonlinear PCM Codes, Companding, PCM Line Speed, Delta Modulation PCM and Differential PCM.

MULTIPLEXING AND T CARRIERS :

Time- Division Multiplexing, T1 Digital Carrier System, North American Digital Multiplexing Hierarchy, Digital Line Encoding, T Carrier systems, European Time- Division Multiplexing, Statistical Time – Division Multiplexing, Frame Synchronization, Frequency- Division Multiplexing, Wavelength- Division Multiplexing, Synchronous Optical Network

Unit IV :

WIRELESS COMMUNICATIONS SYSTEMS :

Electromagnetic Polarization, Rays and Wavefronts, Electromagnetic Radiation, Spherical Wavefront and the Inverse Square Law, wave Attenuation and Absorption, Optical Properties of Radio Waves, Terrestrial Propagation of Electromagnetic Waves, Skip Distance, Free-Space Path Loss, Microwave Communications Systems, Satellite Communications Systems.

Unit V :

TELEPHONE INSTRUMENTS AND SIGNALS:

The Subscriber Loop, Standard Telephone Set, Basic Telephone Call Procedures, Call Progress Tones and Signals, Cordless Telephones, Caller ID, Electronic Telephones, Paging systems.

THE TELEPHONE CIRCUIT:

The Local Subscriber Loop, Telephone Message- Channel Noise and Noise Weighting, Units of Powers Measurement, Transmission Parameters and Private-Line Circuits, Voice-Frequency Circuit Arrangements, Crosstalk.

Unit VI :

CELLULAR TELEPHONE SYSTEMS:

First- Generation Analog Cellular Telephone, Personal Communications system, Second-Generation Cellular Telephone Systems, N-AMPS, Digital Cellular Telephone, Interim Standard, North American Cellular and PCS Summary, Global system for Mobile Communications, Personal Communications Satellite System.

Unit VII:

DATA COMMUNICATIONS CODES, ERROR CONTROL, AND DATA FORMATS:

Data Communications Character Codes, Bar Codes, Error Control, Error Detection, Error Correction, Character Synchronization.

DATA COMMUNICATIONS EQUIPMENT:

Digital Service Unit and Channel Service Unit, Voice- Band Data Communication Modems, Bell Systems- Compatible Voice- Band Modems, Voice- Band Modern Block Diagram, Voice- Band Modem Classifications, Asynchronous Voice-Band Modems, Synchronous Voice-Band Modems, Modem Synchronization, ITU-T Voice- Band Modem Specifications, 56K Modems, Modem Control: The AT Command Set, Cable Modems, Probability of Error and Bit Error Rate.

Unit VIII:**DATA –LINK PROTOCOLS:**

Data –Link Protocol Functions, Character –and Bit- Oriented Protocols, Data Transmission Modes, Asynchronous Data – Link Protocols, Synchronous Data – Link Protocols, Synchronous Data – Link Control, High – Level Data – Link Control.

TEXT BOOKS:

1. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education.

Reference Books

1. Data Communications and Networking, Behrouz A Forouzan, Fourth Edition. TMH.
2. Computer Communications and Networking Technologies, Gallow, Second Edition Thomson
3. Computer Networking and Internet, Fred HalsII, Lingana Gouda Kulkarni, Fifth Edition, Pearson Education

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DESIGN AND ANALYSIS OF ALGORITHMS

UNIT I :

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

UNIT II :

Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and biconnected components.

UNIT III :

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT IV :

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT V :

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT VI :

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

UNIT VII :

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT VIII :

NP-Hard and NP-Complete problems: Basic concepts, non deterministic algorithms, NP - Hard and NP-Complete classes, Cook's theorem.

TEXT BOOKS :

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Algorithm Design: Foundations, Analysis and Internet examples, M.T. Goodrich and R. Tomassia, John Wiley and sons.

REFERENCES :

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, PHI Pvt. Ltd./ Pearson Education
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T. Lee, S.S. Tseng, R.C. Chang and T. Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
5. Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson Education

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0	3	2

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

1. Introduction

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use 'good' English and perform the following:

- Gather ideas and information, to organise ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

2. Objectives:

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.

3. Syllabus:

The following course content is prescribed for the Advanced Communication Skills Lab:

- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
- Group Discussion – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

4. Minimum Requirement:

The English Language Lab shall have two parts:

- i) **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
- ii) **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

- i) P – IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM – 512 MB Minimum
 - c) Hard Disk – 80 GB
- ii) Headphones of High quality

5. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

Suggested Software:

- **Clarity Pronunciation Power** – part II
- **Oxford Advanced Learner's Compass**, 7th Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE**(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
 - **Preparing for being Interviewed,**
 - **Positive Thinking,**
 - **Interviewing Skills,**
 - **Telephone Skills,**
 - **Time Management**
 - **Team Building,**
 - **Decision making**
- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

6. Books Recommended:

1. **Effective Technical Communication**, M. Ashraf Rizvi, Tata Mc. Graw-Hill Publishing Company Ltd.
2. **A Course in English communication** by Madhavi Apte, Prentice-Hall of India, 2007.
3. **Communication Skills** by Leena Sen, Prentice-Hall of India, 2005.
4. **Academic Writing- A Practical guide for students** by Stephen Bailey, Rontledge Falmer, London & New York, 2004.
5. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
6. **Body Language- Your Success Mantra** by Dr. Shalini Verma, S. Chand, 2006.
7. **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice**, New Age International (P) Ltd., Publishers, New Delhi.
8. Books on **TOEFL/GRE/GMAT/CAT** by Barron's/cup
9. **IELTS series with CDs** by Cambridge University Press.
10. **Technical Report Writing Today** by Daniel G. Riordan & Steven E. Pauley, Biztantra Publishers, 2005.
11. **Basic Communication Skills for Technology** by Andra J. Rutherford, 2nd Edition, Pearson Education, 2007.
12. **Communication Skills for Engineers** by Sunita Mishra & C. Muralikrishna, Pearson Education, 2007.
13. **Objective English** by Edgar Thorpe & Showick Thorpe, 2nd edition, Pearson Education, 2007.
14. **Cambridge Preparation for the TOEFL Test** by Jolene Gear & Robert Gear, 4th Edition.
15. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.

DISTRIBUTION AND WEIGHTAGE OF MARKS:***Advanced Communication Skills Lab Practicals:***

1. The practical examinations for the English Language Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

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MICROPROCESSORS INTERFACING LAB

I. Microprocessor 8086 :

1. Introduction to MASM/TASM.
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

II. Interfacing :

1. 8259 – Interrupt Controller : Generate an interrupt using 8259 timer.
2. 8279 – Keyboard Display : Write a small program to display a string of characters.
3. 8255 – PPI : Write ALP to generate sinusoidal wave using PPI.
4. 8251 – USART : Write a program in ALP to establish Communication between two processors.

III. Microcontroller 8051

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

Equipment required for Laboratories:

1. 8086 μ P Kits
2. 8051 Micro Controller kits
3. Interfaces/peripheral subsystems
 - i) 8259 PIC
 - ii) 8279-KB/Display
 - iii) 8255 PPI
 - iv) 8251 USART
4. ADC Interface
5. DAC Interface
6. Traffic Controller Interface
7. Elevator Interface

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NETWORK PROGRAMMING

UNIT-I

Introduction to Network Programming: OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

UNIT-II

Sockets : Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

UNIT-III

TCP client server : Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT-IV

I/O Multiplexing and socket options: I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options.

UNIT-V

Elementary UDP sockets: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

UNIT-VI

Elementary name and Address conversions: DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

UNIT-VII

IPC : Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores.

UNIT-VIII

Remote Login: Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

TEXT BOOKS:

1. UNIX Network Programming, Vol. I, Sockets API, 2nd Edition. - W.Richard Stevens, Pearson Edn. Asia.
2. UNIX Network Programming, 1st Edition, - W.Richard Stevens. PHI.

REFERENCES:

1. UNIX Systems Programming using C++ T CHAN, PHI.
2. UNIX for Programmers and Users, 3rd Edition Graham GLASS, King abls, Pearson Education
3. Advanced UNIX Programming 2nd Edition M. J. ROCHKIND, Pearson Education

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WEB TECHNOLOGIES

Objectives:

This course demonstrate an in-depth understanding of the tools and Web technologies necessary for business application design and development. The course covers client side scripting like HTML, JavaScript and server side scripting like servlets, JSPs. And also XML and web servers and database interfacing.

UNIT-I:

HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;

UNIT-II:

Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT-III:

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

UNIT-IV:

Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's

UNIT-V:

Web Servers and Servlets: Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servelet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues,

UNIT-VI:

Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat

UNIT-VII:

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations

UNIT VIII:

Database Access : Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page, Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page, Introduction to struts framework..

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT s 1,2 ,3)
2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH (Chapters: 25) (UNIT 4)
3. Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 5,6,7,8)

REFERENCE BOOKS:

1. Programming world wide web-Sebesta, Pearson
2. Core SERVLETS AND JAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
4. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly for chap 8.
5. Murach's beginning JAVA JDK 5, Murach, SPD
6. An Introduction to web Design and Programming –Wang-Thomson
7. Web Applications Technologies Concepts-Knuckles, John Wiley
8. Programming world wide web-Sebesta, Pearson
9. Web Warrior Guide to Web Programmimg-Bai/Ekedaw-Thomas
10. Beginning Web Programming-Jon Duckett WROX.
11. Java Server Pages, Pekowsky, Pearson.

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4+1*	0	4

DATA WAREHOUSING AND DATA MINING

UNIT - I

Introduction : Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining.

Data Preprocessing : Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT – II

Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.

UNIT - III

Data Mining Primitives, Languages, and System Architectures : Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on a Data Mining Query Language Architectures of Data Mining Systems.

UNIT - IV

Concepts Description : Characterization and Comparison : 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.

UNIT - V

Mining Association Rules in Large Databases : Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT - VI

Classification and Prediction : Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Backpropagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

UNIT - VII

Cluster Analysis Introduction : Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

UNIT - VIII

Mining Complex Types of Data : Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

TEXT BOOKS :

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt India.

REFERENCES :

1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
- 4 Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION.
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION.

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ADVANCED COMPUTER ARCHITECTURE

Unit - I

Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

Unit - II

Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands- addressing modes for signal processing-operations in the instruction set- instructions for control flow- encoding an instruction set.-the role of compiler

Unit - III

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP

Unit - IV

ILP software approach- compiler techniques- static branch protection - VLIW approach - H.W support for more ILP at compile time- H.W verses S.W Solutions

Unit - V

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM.

Unit - VI

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

Unit - VII

Storage systems- Types – Buses - RAID- errors and failures- bench marking a storage device- designing a I/O system.

Unit - VIII

Inter connection networks and clusters- interconnection network media – practical issues in interconnecting networks- examples – clusters- designing a cluster.

TEXT BOOK :

1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann (An Imprint of Elsevier)

REFERENCES :

1. "Computer Architecture and parallel Processing" Kai Hwang and A.Briggs International Edition McGraw-Hill.
2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.
3. Parallel Computer Architecture, A Hardware / Software Approach, David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier

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**EMBEDDED SYSTEMS
(Elective-I)**

Unit - I

Embedded Computing : Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. (**Chapter 1 from Text Book 1, Wolf**).

Unit - II

The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts. (**Chapter 3 from Text Book 2, Ayala**).

Unit - III

Basic Assembly Language Programming Concepts : The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions. (**Chapters 4,5 and 6 from Text Book 2, Ayala**).

Unit - IV

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts. (**Chapter 7 and 8 from Text Book 2, Ayala**)

Unit - V

Applications : Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication. (**Chapter 10 and 11 from Text Book 2, Ayala**).

Unit - VI

Introduction to Real – Time Operating Systems : Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment. (**Chapter 6 and 7 from Text Book 3, Simon**).

Unit - VII

Basic Design Using a Real-Time Operating System : Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System. (Chapter 8,9,10 & 11 from Text Book 3, Simon).

Unit - VIII

Introduction to advanced architectures : ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller. (**Chapter 8 from Text Book 1, Wolf**).

TEXT BOOKS :

1. Computers as Components-principles of Embedded computer system design, Wayne Wolf, Elsevier.
2. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.

REFERENCES :

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

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**MOBILE COMPUTING
(Elective - I)**

UNIT - I

Introduction to Mobile Communications and Computing : Mobile Computing (MC) : Introduction to MC, novel applications, limitations, and architecture.

GSM : Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

UNIT - II

(Wireless) Medium Access Control : Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT - III

Mobile Network Layer : Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

UNIT - IV

Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT - V

Database Issues : Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT - VI

Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

UNIT - VII

Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

UNIT - VIII

Protocols and Tools : Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

TEXT BOOKS :

1. **Jochen Schiller**, "Mobile Communications", *Addison-Wesley*. (Chapters 4,7,9,10,11), second edition, 2004.
2. **Stojmenovic and Cacute**, "Handbook of Wireless Networks and Mobile Computing", *Wiley*, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

REFERENCES :

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004,
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", *Springer*, second edition, 2003.
4. Martyn Mallick, "Mobile and Wireless Design Essentials", *Wiley DreamTech*, 2003.

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**MULTIMEDIA AND APPLICATION DEVELOPMENT
(ELECTIVE - I)**

UNIT - I

Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT - II

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT - III

Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class.

UNIT - IV

Action Script II : Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.

UNIT - V

Application Development : An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.

UNIT - VI

Multimedia data compression : Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

UNIT - VII

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

UNIT - VIII

Multimedia Networks: Basics of Multimedia Networks, 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).

TEXT BOOKS :

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/Pearson Education.
2. Essentials ActionScript 2.0, Colin Mook, SPD O,REILLY.

REFERENCES :

1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech
2. Macromedia Flash MX Professional 2004 Unleashed, Pearson.
3. Multimedia and communications Technology, Steve Heath, Elsevier(Focal Press).
4. Multimedia Applications, Steinmetz, Nahrstedt, Springer.
5. Multimedia Basics by Weixel Thomson
6. Multimedia Technology and Applications, David Hilman , Galgotia

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**SOFTWARE PROJECT MANAGEMENT
(Elective-II)**

UNIT - I

Conventional Software Management : The waterfall model, conventional software Management performance.

Evolution of Software Economics : Software Economics, pragmatic software cost estimation.

UNIT - II

Improving Software Economics : Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

The old way and the new : The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT - III

Life cycle phases : Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process : The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT - IV

Model based software architectures : A Management perspective and technical perspective.

Work Flows of the process : Software process workflows, Iteration workflows.

UNIT - V

Checkpoints of the process : Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning : Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT - VI

Project Organizations and Responsibilities : Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation : Automation Building blocks, The Project Environment.

UNIT - VII

Project Control and Process instrumentation : The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process : Process discriminants.

UNIT - VIII

Future Software Project Management : Modern Project Profiles, Next generation Software economics, modern process transitions.

Case Study: The command Center Processing and Display system- Replacement (CCPDS-R)

TEXT BOOK :

1. Software Project Management, Walker Royce: Pearson Education, 2005.

REFERENCES :

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.

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**ADVANCED COMPUTING CONCEPTS
(ELECTIVE - II)**

UNIT I

Grid Computing : Data & Computational Grids, Grid Architectures and its relations to various Distributed Technologies

UNIT II

Autonomic Computing, Examples of the Grid Computing Efforts (IBM).

UNIT III

Cluster setup & its Advantages, Performance Models & Simulations; Networking Protocols & I/O, Messaging systems.

UNIT IV

Process scheduling, Load sharing and Balancing; Distributed shared memory, parallel I/O .

UNIT - V

Example cluster System - Beowlf; Cluster Operating systems: COMPaS and NanOS

UNIT - VI

Pervasive Computing concepts & Scenarios; Hardware & Software; Human - machine interface.

UNIT - VII

Device connectivity; Java for Pervasive devices; Application examples

UNIT - VIII

Classical Vs Quantum logic gates ;One ,two & three QUbit Quantum gates; Fredkin & Toffoli gates ;Quantum circuits; Quantum algorithms.

TEXT BOOK :

1. J. Joseph & C. Fellenstein:' Grid Computing ', Pearson Education.
2. J.Burkhardt et .al :'Pervasive computing' Pearson Education
3. Marivesar:'Approaching quantum computing ', Pearson Education.

REFERENCES :

1. Raj Kumar Buyya:'High performance cluster computing', Pearson Education.
2. Neilsen & Chung L:'Quantum computing and Quantum Information', Cambridge University Press.
3. A networking approach to Grid Computing , Minoli, Wiley.

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**NETWORK MANAGEMENT SYSTEMS
(ELECTIVE - II)**

UNIT - I

Data communications and Network Management Overview : Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

UNIT - II

SNMPV1 Network Management : Organization and Information and Information Models.
Managed network : Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

UNIT - III

SNMPv1 Network Management : Communication and Functional Models. The SNMP Communication Model, Functional model.

UNIT - IV

SNMP Management: SNMPv2 : Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility With SNMPv1.

UNIT - V

SNMP Management : RMON : What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON

UNIT - VI

Telecommunications Management Network : Why TMN? , Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, mplementation Issues.

UNIT - VII

Network Management Tools and Systems:Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.

UNIT - VIII

Web-Based Management:NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network: , Future Directions.

TEXT BOOK :

1. Network Management, Principles and Practice, Mani Subrahmanian, Pearson Education.

REFERENCES :

1. Network management, Morris, Pearson Education.
2. Principles of Network System Administration, Mark Burges, Wiley Dreamtech.
3. Distributed Network Management, Paul, John Wiley.

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NETWORK PROGRAMMING LAB

Objectives:

- To teach students various forms of IPC through Unix and socket Programming

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space LAN Connected
- Any flavour of Unix / Linux

Week1.

Implement the following forms of IPC.

- a) Pipes
- b) FIFO

Week2.

Implement file transfer using Message Queue form of IPC

Week3.

Write a programme to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use senphores to avoid race conditions

Week4.

Design TCP iterative Client and server application to reverse the given input sentence

Week5.

Design TCP iterative Client and server application to reverse the given input sentence

Week6.

Design TCP client and server application to transfer file

Week7.

Design a TCP concurrent server to convert a given text into upper case using multiplexing system call "select"

Week8.

Design a TCP concurrent server to echo given set of sentences using poll functions

Week9.

Design UDP Client and server application to reverse the given input sentence

Week10

Design UDP Client server to transfer a file

Week11

Design using poll client server application to multiplex TCP and UDP requests for converting a given text into upper case.

Week12

Design a RPC application to add and subtract a given pair of integers

Reference Book:

1. Advance Unix Programming Richard Stevens, Second Edition Pearson Education
2. Advance Unix Programming, N.B. Venkateswarlu, BS Publication.

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WEB TECHNOLOGIES LAB

Objective :

To create a fully functional website with mvc architecture. To Develop an online Book store using we can sell books (Ex amazon .com).

Hardware and Software required :

1. A working computer system with either Windows or Linux
2. A web browser either IE or firefox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy – free] , Stylusstudio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system
7. BDK(Bean development kit) must be also be installed

Week-1:

Design the following static web pages required for an online book store web site.

1) HOME PAGE:

The static home page must contain three **frames**.

Top frame : Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame : At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link “**CSE**” the catalogue for **CSE** Books should be displayed in the Right frame.

Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Web Site			

Fig 1.1

2) LOGIN PAGE:


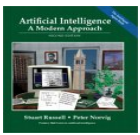



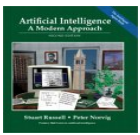



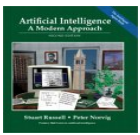


This page looks like below:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	<p style="text-align: center;">Login : <input type="text"/> Password: <input type="password"/></p> <p style="text-align: center;"><input type="button" value="Submit"/> <input type="button" value="Reset"/></p>			

3) CATALOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.
 The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

Logo	Web Site Name																			
Home	Login	Registration	Catalogue	Cart																
CSE ECE EEE CIVIL	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 20%; text-align: center;"></td> <td style="width: 30%;">Book : XML Bible Author : Winston Publication : Wiely</td> <td style="width: 15%; text-align: center;">\$ 40.5</td> <td style="width: 35%; text-align: center;"><input type="button" value="Add to cart"/></td> </tr> <tr> <td style="text-align: center;"></td> <td>Book : AI Author : S.Russel Publication : Princeton hall</td> <td style="text-align: center;">\$ 63</td> <td style="text-align: center;"><input type="button" value="Add to cart"/></td> </tr> <tr> <td style="text-align: center;"></td> <td>Book : Java 2 Author : Watson Publication : BPB publications</td> <td style="text-align: center;">\$ 35.5</td> <td style="text-align: center;"><input type="button" value="Add to cart"/></td> </tr> <tr> <td style="text-align: center;"></td> <td>Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication</td> <td style="text-align: center;">\$ 50</td> <td style="text-align: center;"><input type="button" value="Add to cart"/></td> </tr> </tbody> </table>					Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	<input type="button" value="Add to cart"/>		Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	<input type="button" value="Add to cart"/>		Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	<input type="button" value="Add to cart"/>		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	<input type="button" value="Add to cart"/>
	Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	<input type="button" value="Add to cart"/>																	
	Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	<input type="button" value="Add to cart"/>																	
	Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	<input type="button" value="Add to cart"/>																	
	Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	<input type="button" value="Add to cart"/>																	

Note: Week 2 contains the remaining pages and their description.

Week-2:**4) CART PAGE:**

The cart page contains the details about the books which are added to the cart.
The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Book name	Price	Quantity	Amount
	Java 2	\$35.5	2	\$70
	XML bible	\$40.5	1	\$40.5
	Total amount -			\$130.5

5) REGISTRATION PAGE:

Create a "registration form" with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)

WEEK 3:

VALIDATION:

Write *JavaScript* to validate the following fields of the above registration page.

1. Name (Name should contains alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

Week-4:

Design a web page using **CSS (Cascading Style Sheets)** which includes the following:

- 1) Use different font, styles:
In the style definition you define how each selector should work (font, color etc.).
Then, in the body of your pages, you refer to these selectors to activate the styles.

For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-decoration:underline}
</style>
</HEAD>
```

```

<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}

For example:

<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>

<b class="headline">This is headline style bold</b>
</BODY>

</HTML>

```

- 2) Set a background image for both the page and single elements on the page.
You can define the background image for the page like this:

```

BODY {background-image:url(myimage.gif);}

```

- 3) Control the repetition of the image with the background-repeat property.
As background-repeat: repeat
Tiles the image until the entire page is filled, just like an ordinary background image
in plain HTML.

- 4) Define styles for links as
A:link
A:visited
A:active
A:hover

Example:

```

<style type="text/css">
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline; color: red;}
</style>

```

- 5) Work with layers:

For example:

```

LAYER 1 ON TOP:
<div style="position:relative; font-size:50px; z-index:2;">LAYER 1</div>
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-
index:1">LAYER 2</div>

```

LAYER 2 ON TOP:

```

<div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-
index:4">LAYER 2</div>

```

- 6) Add a customized cursor:
 Selector {cursor:value}
 For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

Week-5:

Write an XML file which will display the Book information which includes the following:

- 1) Title of the book
- 2) Author Name
- 3) ISBN number
- 4) Publisher name
- 5) Edition
- 6) Price

Write a Document Type Definition (DTD) to validate the above XML file.

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.

Hint: You can use some xml editors like XML-spy

Week-6:

VISUAL BEANS:

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window".

Week-7:

- 1) Install TOMCAT web server and APACHE.
 While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.
- 2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.
 Access the pages by using the urls : <http://localhost:4040/rama/books.html> (for tomcat)
<http://localhost:8080/books.html> (for Apache)

Week-8:

User Authentication :

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servlet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display " You are not an authenticated user ". Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

Week-9:

Install a database(Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

Week-10:

Write a JSP which does the following job:

Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database (similar to week8 instead of cookies).

Week-11:

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount)) of each category. Modify your catalogue page (week 2)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

Week-12:

HTTP is a stateless protocol. Session is required to maintain the state.

The user may add some items to cart from the catalog page. He can check the cart page for the

selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method session.invalidate()).

Modify your catalogue and cart JSP pages to achieve the above mentioned functionality using sessions.