ANNA UNIVERSITY TIRUCHIRAPPALLI
Tiruchirappalli – 620 024
Regulations 2007
Curriculum
B.E. COMPUTER SCIENCE AND ENGINEERING

SEMESTER III

S.No.	Subject Code	Subject	L	T	P	Max. Marks
		Theory				
1	MA1201	Mathematics III	3	1	0	100
2	CS1201	Data Structures	3	1	0	100
3	EC1206	Electronic Devices and Circuits	3	1	0	100
4	CS1202	Computer Architecture	3	1	0	100
5	CS1203	Object Oriented Programming	3	0	0	100
6	EE1212	Electrical Engineering and Control Systems	3	0	0	100
		Practical				
7	CS1204	Data Structures Laboratory	0	0	3	100
8	EC1208	Electronic Devices and Circuits Laboratory	0	0	3	100
9	CS1205	Object Oriented Programming Laboratory	0	0	3	100

SEMESTER IV

S.No.	Subject Code	Subject	L	T	P	Max. Marks
		Theory				
1	MA1252	Probability and Queuing Theory	3	1	0	100
2	CS1251	Design and Analysis of Algorithms	3	0	0	100
3	EC1207	Principles of Communication Engineering	3	1	0	100
4	CS1252	System Software	3	0	0	100
5	CS1253	Operating Systems	3	1	0	100
6	CS1254	Database Management Systems	3	1	0	100
		Practical				
7	CS1255	System Software Laboratory	0	0	3	100
8	CS1256	Operating Systems Laboratory	0	0	3	100
9	CS1257	Database Management Systems Laboratory	0	0	3	100

SEMESTER V

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	MA1301	Discrete Mathematics	3	1	0	100
2	CS1301	Software Engineering	3	0	0	100
3	CS1302	Computer Networks	3	0	0	100
4	CS1303	Theory of Computation	3	0	0	100
5	EC1301	Microprocessors and Microcontrollers	3	1	0	100
6	CS1304	Visual Programming	3	1	0	100
Practical						
7	CS1305	Network Laboratory	0	0	3	100
8	EC1305	Microprocessors and Microcontrollers Laboratory	0	0	3	100
9	CS1306	Visual Programming Laboratory	0	0	3	100

SEMESTER VI

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	MA1251	Numerical Methods	3	1	0	100
2	CS1351	Artificial Intelligence	3	0	0	100
3	CS1352	Principles of Compiler Design	3	1	0	100
4	CS1353	Distributed Systems	3	1	0	100
5	CS1354	Graphics and Multimedia	3	0	0	100
6	HS1201	Environmental Science and Engineering	3	0	0	100
Practical						
7	CS1355	Compiler Design Laboratory	0	0	3	100
8	CS1356	Graphics and Multimedia Laboratory	0	0	3	100
9	HS1301	Communication and Soft Skills Laboratory	1	0	3	100

SEMESTER VII

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	**CS1401**	Internet Computing	3	0	0	100
2	**CS1361**	Object Oriented Analysis and Design	3	0	0	100
3	**CS1402**	Middleware Technologies	3	1	0	100
4	**MG1352**	Total Quality Management	3	1	0	100
5	**E1******	Elective I	3	0	0	100
6	**E2******	Elective II	3	0	0	100
Practical						
7	**CS1403**	CASE Tools Laboratory	0	0	3	100
8	**CS1404**	Middleware Technologies Laboratory	0	0	3	100
9	**CS1405**	Software Development Laboratory	0	0	3	100

SEMESTER VIII

S.No.	Subject Code	Subject	L	T	P	Max. Marks
Theory						
1	**EC1411**	Mobile Computing	3	0	0	100
2	**CS1451**	Network Protocols	3	0	0	100
3	**E3******	Elective III	3	0	0	100
4	**E4******	Elective IV	3	0	0	100
Practical						
5	**CS1455**	Project Work	0	0	12	200

LIST OF ELECTIVES

S.No.	Subject Code	Subject	L	T	P	Max. Marks
ELECTIVE I						
1	**CS1001**	Parallel Computing	3	0	0	100
2	**CS1002**	Digital Image Processing	3	0	0	100
3	**CS1003**	Component Based Technology	3	0	0	100
4	**CS1004**	Natural Language Processing	3	0	0	100
5	**CS1005**	UNIX Internals	3	0	0	100
6	**CS1006**	Open Source Software	3	0	0	100
7	**CS1007**	Wireless Network Systems	3	0	0	100
ELECTIVE II						
8	**EC1021**	High Performance Microprocessors	3	0	0	100
9	**CS1008**	Advanced Java Programming	3	0	0	100
10	**CS1009**	Advanced Databases	3	0	0	100
11	**CS1010**	Advanced Operating Systems	3	0	0	100
12	**EC1401**	Embedded Systems	3	0	0	100
13	**CS1011**	Data Warehousing and Data Mining	3	0	0	100
14	**CS1012**	Knowledge Based Decision Support Systems	3	0	0	100
ELECTIVE III						
15	**CS1013**	C# and .NET	3	0	0	100
16	**IT1451**	XML and Web Services	3	0	0	100
17	**CS1014**	User Interface Design	3	0	0	100
18	**CS1015**	Information Security	3	0	0	100
19	**CS1016**	Software Testing	3	0	0	100
20	**GE1351**	Professional Ethics and Human Values	3	0	0	100
21	**CS1017**	TCP/IP Design and Implementation	3	0	0	100
ELECTIVE IV						
22	**CS1018**	Grid Computing	3	0	0	100
23	**CS1019**	Fundamentals of Pervasive Computing	3	0	0	100
24	**CS1020**	Real Time Systems	3	0	0	100
25	**CS1021**	Soft Computing	3	0	0	100
26	**CS1022**	Software Project Management	3	0	0	100
27	**CS1023**	Resource Management Techniques	3	0	0	100
28	**CS1024**	Software Quality Management	3	0	0	100

ANNA UNIVERSITY TIRUCHIRAPPALLI
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Regulations 2007

Syllabus

B.E. COMPUTER SCIENCE AND ENGINEERING

SEMESTER III

MA1201 – MATHEMATICS III
(Common to all branches)

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UNIT I   **PARTIAL DIFFERENTIAL EQUATIONS**   **9**

Formation of Partial Differential Equations by Elimination of Arbitrary Constants and Arbitrary Functions – Solution of Standard Types of First Order Partial Differential Equations – Lagrange's Linear Equation – Linear Partial Differential Equations of Second and Higher Order with Constant Coefficients.

UNIT II   **FOURIER SERIES**   **9**

Dirichlet's Conditions – General Fourier Series – Odd and Even Functions – Half Range Sine Series – Half Range Cosine Series – Complex form of Fourier Series – Parseval's Identity – Harmonic Analysis.

UNIT III   **BOUNDARY VALUE PROBLEMS**   **9**

Classification of Second Order Quasi Linear Partial Differential Equations – Solutions of One Dimensional Wave Equation – One Dimensional Heat Equation – Steady State Solution of Two–Dimensional Heat Equation (Insulated Edges Excluded) – Fourier Series Solutions in Cartesian Coordinates.

UNIT IV   **FOURIER TRANSFORM**   **9**

Fourier Integral Theorem (without proof) – Fourier Transform Pair – Sine and Cosine Transforms – Properties – Transforms of Simple Functions – Convolution Theorem – Parseval's Identity.

UNIT V   **Z -TRANSFORM AND DIFFERENCE EQUATIONS**   **9**

Z-Transform – Elementary Properties – Inverse Z-Transform – Convolution Theorem – Formation of Difference Equations – Solution of Difference Equations Using Z-Transform.

L: 45 T: 15 Total 60

TEXT BOOK

1. Grewal B.S., "Higher Engineering Mathematics", Fortieth Edition, Khanna Publishers, 2007.

REFERENCES

1. Churchill R.V. and Brown J.W., "Fourier Series and Boundary Value Problems", Fourth Edition, McGraw-Hill Book Co., 1987.
2. Veerarajan .T, "Engineering Mathematics III", Third Edition, Tata McGraw-Hill Education, 2007.
3. Kandasamy P., Thilagavathy K. and Gunavathy K., "Engineering Mathematics Volume III", S. Chand and Company ltd., 1996.

CS1201 – DATA STRUCTURES

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UNIT I   PROBLEM SOLVING   9

Problem Solving – Top-down Design – Implementation – Verification – Efficiency – Analysis – Sample Algorithms.

UNIT II   LISTS - STACKS AND QUEUES   8

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT

UNIT III   TREES   10

Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple Implementations – Binary Heap

UNIT IV   SORTING   9

Insertion Sort–Shell Sort – Heap Sort – Merge Sort – Quick Sort – External Sorting

UNIT V   GRAPHS   9

Topological Sort – Shortest Path Algorithms – Unweighted Shortest Paths – Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity – Introduction to NP Completeness

L: 45 T: 15 Total: 60

TEXT BOOKS

1. R. G. Dromey, "How to Solve it by Computer", First Edition, Pearson Education, 2006.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, Second Edition, 2002.

REFERENCES

1. Y. Langsam M. J. Augenstein and A. M. Tenenbaum, "Data Structures using C", Pearson Education, 2004.
2. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures - A Pseudocode Approach with C", Thomson Brooks / COLE, 1998.
3. Aho J. E. Hopcroft and J. D. Ullman, "Data Structures and Algorithms", Pearson education, 1983.
4. Harowitz, Sahani, Anderson-Freed, "Fundamentals of Data Structures in C", Second Edition, Universities Press, 2007.

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UNIT I   ELECTRON BALLISTICS AND APPLICATIONS   9

Force on charged particles in an electric field – magnetic field – calculation of electrostatic and magnetic deflection sensitivity in cathode ray tube – analysis of parallel and perpendicular electric and magnetic fields – cyclotron – energy band structure of conductors – intrinsic and extrinsic semiconductor – N and P type – insulators – Hall effect.

UNIT II   SEMICONDUCTOR DIODES   9

PN junction – derivation of diode equation – current components – switching characteristics of diode – common diode applications – characteristics and applications of Varactor diode and Zener diode – Mechanism of Avalanche and Zener breakdown – backward diode – tunnel diode – PIN diode – point contact diode – Schottky barrier diode – photo diode – APD – light emitting diodes.

UNIT III   BIPOLAR JUNCTION TRANSISTORS AND

**   FIELD EFFECT TRANSISTORS   9**

Bipolar junction transistor – PNP and NPN action – current components – Eber-Moll model – transistor switching times – comparison of CE, CB and CC configuration – BJT applications – construction and characteristics of JFET – Relation between Pinch-off voltage and Drain current – MOSFET – enhancement and depletion types – MESFET – introduction to VMOS and CMOS devices.

UNIT IV   TRANSISTOR BIASING   9

BJT – operating point – need for biasing – various biasing methods of BJT – bias stability – stability parameters – biasing methods of FET – use of JFET as a voltage variable resistor (VVR).

UNIT V   POWER SUPPLY AND POWER AMPLIFIERS   9

Basic Elements of Regulated Power Supply System – Stabilization – Series and Shunt Voltage Regulators – General purpose and Monolithic Linear Regulators – Switching Regulators. Classification of Power Amplifiers (Class A, B, AB, CandD) – Efficiency of Class A – RC Coupled and Transformer – Coupled Power Amplifiers – Class B Complementary-Symmetry – Push-Pull Power Amplifiers.

L: 45 T: 15 Total: 60

TEXT BOOKS

1.   Jacob Millman and Christos C.Halkias, "Electronic Devices and Circuits" Tata McGraw-Hill, 1991.
2.   Robert T.Paynter, Introductory Electronic Devices and Circuits, Pearson Education, Seventh Edition, 2006.

REFERENCES

1.   Boylestad ,R.L and Nashelsky,L,"Electronic Devices and Circuit Theory", Pearson Education,1997
2.   Donald A.Neaman," Semiconductor Physics and Devices" Third Edition, Tata McGraw-Hill, 2002.
3.   S.Salivahanan, N.Sureshkumar and A.Vallavaraj, "Electronic Devices and Circuits", Tata McGraw-Hill, 1998.

CS1202 – COMPUTER ARCHITECTURE

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UNIT I   BASIC STRUCTURE OF COMPUTERS   9

Functional Units – Basic Operational Concepts – Bus Structures – Software Performance – Memory Locations and Addresses – Memory Operations – Instruction and Instruction Sequencing – Addressing Modes – Assembly Language – Basic I/O Operations – Stacks and Queues.

UNIT II   ARITHMETIC UNIT   9

Addition And Subtraction of Signed Numbers – Design of Fast Adders – Multiplication of Positive Numbers – Signed Operand Multiplication – Fast Multiplication – Integer Division – Floating-Point Numbers and Operations.

UNIT III   BASIC PROCESSING UNIT   9

Fundamental Concepts – Execution of a Complete Instruction – Multiple Bus Organization – Hardwired Control – Microprogrammed Control – Pipelining – Basic Concepts – Data Hazards – Instruction Hazards – Influence on Instruction Sets – Data Path and Control Consideration – Superscalar Operation – Performance Considerations.

UNIT IV   I/O ORGANIZATION   9

Accessing I/O Devices – Interrupts – Direct Memory Access – Buses – Interface Circuits – Standard I/O Interfaces (PCI - SCSI - USB).

UNIT V   MEMORY SYSTEM   9

Memory Concepts – Semiconductor RAMs – ROMs – Speed, Size and Cost – Cache Memories – Performance Considerations – Virtual Memories – Memory Management Requirements – Secondary Storage.

L: 45 T: 15 Total: 60

TEXT BOOK

1.   Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, McGraw-Hill, 2002.

REFERENCES

1.   William Stallings, "Computer Organization and Architecture: Designing for Performance", Sixth Edition, Pearson Education, 2003.
2.   David A Patterson and John L.Hennessy, "Computer Organization and Design The hardware / software interface", Second Edition, Morgan Kaufmann, 2002.
3.   John P Hayes, "Computer Architecture and Organization", Third Edition, McGraw-Hill, 1998.

CS1203 – OBJECT ORIENTED PROGRAMMING

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UNIT I   FUNDAMENTALS   9

Object–Oriented Programming Concepts – Encapsulation – Programming Elements – Program Structure – Enumeration Types —— Functions and Pointers – Function Invocation – Overloading Functions – Scope and Storage Class – Pointer Types – Arrays and Pointers – Call-by-Reference – Assertions – Standard template library.

UNIT II   IMPLEMENTING ADTS AND ENCAPSULATION   9

Aggregate Type struct – Structure Pointer Operators – Unions – Bit Fields – Data Handling and Member Functions – Classes – Constructors and Destructors – Static Member – this Pointer – Reference Semantics – Implementation of simple ADTs.

UNIT III   POLYMORPHISM   9

ADT Conversions – Overloading – Overloading Operators – Unary Operator Overloading – Binary Operator Overloading – Function Selection – Pointer Operators

UNIT IV   INHERITANCE   9

Derived Class – Typing Conversions and Visibility – Code Reuse – Virtual Functions – Run-Time Type Identifications –Exceptions – Handlers – Standard Exceptions.

UNIT V   TEMPLATES AND FILE HANDLING   9

Template Class – Function Templates – Class Templates – C++ Streams – Console Streams – Console Stream Classes – Formatted and Unformatted Console I/O Operations – Manipulators – File Streams – Classes File Modes – File Pointers and Manipulations – File I/O – Exception Handling.

Total: 45

TEXT BOOKS

1.   Ira Pohl, "Object–Oriented Programming Using C++", Pearson Education, Second Edition, 2003.
2.   K.R.Venugopal, Rajkumar Buyya and T.Ravishankar, "Mastering C++", Tata McGraw-Hill H, 2003 .

REFERENCES

1.   Ashok N.Kamthane, "Object-Oriented Probramming with ANSI and Turbo C++", Pearson Education,2006.
2.   Bjarne Stroustrup, "The C++ programming language", Addison Wesley, 2000.
3.   John R.Hubbard, "Progranning with C++", Schaums outline series, TMH, 2003.

EE1212 – ELECTRICAL ENGINEERING AND CONTROL SYSTEMS

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UNIT I   ELECTRIC CIRCUITS   9

Basics of Electricity – Electric Energy and Power – Circuit Elements and Sources – Kirchoff's Laws – Series and Parallel Combination of Resistances – Mesh Analysis – Nodal Analysis – Superposition Theorem – Thevenin's Theorem – Norton's Theorem – Maximum Power Transfer Theorem.

UNIT II   STEADY STATE ANALYSIS OF SINUSOIDAL EXCITATION   9

Sinusoidal Excitation – RMS – Average – Peak Values – Phasor Representation – RC, RL and RLC Circuits – Complex Power – Resonance – Three Phase Circuits – Line and Phase Values.

UNIT III   D.C.MACHINES AND TRANSFORMER   9

D.C. Machines – Constructional features – EMF and Torque – Circuit Model – Characteristics of D.C. Motors – Speed Control – Transformers – Constructional Features – Transformer Operation – Voltage Regulation – Efficiency.

UNIT IV   A.C.MACHINES   9
Alternators – Principles of Operations – Synchronous Machines – Circuit Model – Armature Leakage Reactance – Synchronous Reactance – Voltage Regulation – Induction Machines – Construction – Circuit Model – Power Across Airgap, Torque and Power Output – Torque–Slip Characteristic – Starting Arrangements – Speed Control of Induction Motor – Single Phase Induction Motors – A.C. Series Motor.

UNIT V   CONTROL SYSTEMS   9
Introduction to Control Systems – Closed Loop Control – Examples – Mathematical Models of Simple Physical Systems – Transfer Function – Control Components – D.C. and A.C. Servo motors – Potentiometers – Stepper Motors – Time Response of First and Second Order Systems.

Total: 45

TEXT BOOKS

1.   D.P.Kothari and I.J.Nagrath, "Basic Electrical Engineering", Second Edition, Tata McGraw Hill, 2002.
2.   I.J. Nagrath and M. Gopal, "Control Systems Engineering", New Age International Publishers, 2007.

REFERENCES

1.   B.L. Theraja and A.K. Theraja, " A Textbook of Electrical Technology", Volume I and II, S.Chand, 2005
2.   Naresh K. Sinha, "Control Systems", Revised Third Edition, New Age International Publishers, 1998

CS1204 – DATA STRUCTURES LABORATORY

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Implement the following exercises using C

1.   Array Implementation of List ADT
2.   Linked List Implementation of List ADT
3.   Cursor Implementation of List ADT
4.   Array Implementation of Stack ADT
5.   Linked List Implementation of Stack ADT

6.   The following three exercises are to be done by implementing the following source files
        (a) Program for 'Balanced Paranthesis'
        (b) Array Implementation of Stack ADT
        (c) Linked List Implementation of Stack ADT
        (d) Program for 'Evaluating Postfix Expressions'
    An appropriate header file for the Stack ADT should be included in (a) and (d)

    I.   Implement the application for checking 'Balanced Paranthesis' using Array Implementation of Stack ADT (by implementing files (a) and (b) given above)

    II.   Implement the application for checking 'Balanced Paranthesis' using Linked List Implementation of Stack ADT (by using file (a) from experiment 1 and implementing file (c))

    III. Implement the application for 'Evaluating Postfix Expressions' using array and Linked List implementations of Stack ADT (by Implementing file (d) and using file (b) - and then by using files (d) and (c))

7.   Queue ADT

8.   Search Tree ADT – Binary Search Tree

9.   Heap Sort

10.   Quick Sort

Total: 45

EC1208 – ELECTRONIC DEVICES AND CIRCUITS LABORATORY

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1.   Measurement of characteristics of PN Junction Diode.
2.   Measurement of characteristics of Zener Diode
3.   Measurement of characteristics of Special Diodes such as
    a.   Varactor Diode
    b.   Tunnel Diode
    c.   Photo Diode
    d.   Schottky Diode
4.   Clipper and Clamper Circuits using Diode.
5.   Design and testing of Rectifiers with and without Filters.
6.   Input and Output characteristics of BJT and determination of h- parameters from the graph.
    7.   Output characteristics of JFET.
    a..   Plot of Transfer characteristics from the output characteristics.
    b.   Determination of pinch off voltage and Ids
    8.   Fixed Bias amplifier circuits using BJT.
9.   BJT Amplifier using voltage divider bias (self bias) with unbypassed emitter resistor.
10.   Source follower with Bootstrapped gate resistance.
11.   Measurement of UJT and SCR Characteristics.
    a.   Firing Characteristics of SCR.
    b.   Measurement of Intrinsic stands off ratio of UJT.
    c.   Measurement of DIAC and TRIAC Characteristics.
12.   Measurement of Characteristics of Power Amplifiers (Class A, B and C)

Total: 45

CS1205 – OBJECT ORIENTED PROGRAMMING LABORATORY

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1. Programs Using Functions
    - Functions with Default Arguments
    - Implementation of Call by Value- Call by Address

2. Simple Classes for understanding objects- member functions and Constructors
    - Classes with Primitive Data Members
    - Classes with Arrays as Data Members
    - Classes with Pointers as Data Members - String Class
    - Classes with Constant Data Members
    - Classes with Static Member Functions
3. Compile Time Polymorphism
    - Operator Overloading including Unary and Binary Operators
    - Function Overloading
4. Runtime Polymorphism
    - Inheritance
    - Virtual Functions
    - Virtual Base Classes
    - Templates
5. File Handling
    - Sequential Access
    - Random Access

Total: 45

SEMESTER IV

MA1252 – PROBABILITY AND QUEUEING THEORY

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UNIT I   PROBABILITY AND RANDOM VARIABLE   9

Axioms of Probability – Conditional Probability – Total Probability – Baye's Theorem– Random variable – Probability mass function – Probability density function – Properties – Moments – Moment generating functions and their properties.

UNIT II   STANDARD DISTRIBUTIONS   9

Binomial – Poisson – Uniform – Exponential – Gamma – Normal distributions and their properties – Functions of a random variable – Chebyshev inequality.

UNIT III   TWO DIMENSIONAL RANDOM VARIABLES   9

Joint distributions – Marginal and conditional distributions – Covariance – Correlation and regression – Transformation of random variables – Central limit theorem.

UNIT IV   RANDOM PROCESSES AND MARKOV CHAINS   9

Classification – Stationary process – Markov process – Poisson process – Birth and death process – Markov chains – Transition probabilities – Limiting distributions.

UNIT V   QUEUEING THEORY   9

Markovian models – M/M/1 – M/M/C – finite and infinite capacity – M/M/∞ queues – Finite source model – M/G/1 queue (steady state solutions only) – Pollaczek – Khintchine formula – Special cases.

L: 45 T: 15 Total: 60

TEXT BOOKS

1.   Ross S, "A first course in probability", Sixth Edition, Pearson Education, 2006.
2.   S.Karlin and H.M. Taylor., "An Introduction to Stochastic Modeling" Academic Press, 2007
3.   Taha, H. A., "Operations Research-An Introduction", Seventh Edition, Pearson Education, 2007.

REFERENCES

1.   Veerarajan T, "Probability, Statistics and Random Processes", Second Edition, Tata McGraw Hill, 2003.
2.   Richard A Johnson, "Probability and Statistics for Engineers", Seventh Edition, Pearson Education, 2005.
3.   Gross D. and Harris, C.M., "Fundamentals of Queuing Theory", Third Edition, John Wiley and Sons, 1998.

CS1251 – DESIGN AND ANALYSIS OF ALGORITHMS

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UNIT I   BASIC CONCEPTS OF ALGORITHMS   8

Basic Concepts – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT II   MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS   8

Mathematical Analysis of Non–recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT III   ANALYSIS OF SORTING AND SEARCHING ALGORITHMS   10

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute – Force String Matching – Divide And Conquer – Merge Sort – Quick Sort – Binary Search – Binary Tree – Traversal and Related Properties – Insertion Sort – Depth First Search and Breadth First Search.

UNIT IV   ALGORITHMIC TECHNIQUES   10

Transform and Conquer – Presorting – Balanced Search Trees – AVL Trees – Heaps and Heap sort – Dynamic Programming – Warshall's and Floyd's Algorithm – Optimal Binary Search Trees – Greedy Techniques – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman Trees.

UNIT V   ALGORITHM DESIGN METHODS   9

Backtracking – 8-Queen's Problem – Hamiltonian Circuit Problem – Subset – Sum Problem – Branch and Bound – Assignment Problem – Knapsack Problem – Traveling Salesman Problem.

Total: 45

TEXT BOOK
1.   Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education, 2003.

REFERENCES

1.   T.H. Cormen C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", Second Edition, PHI,   2007.
2.   Sara Baase and Allen Van Gelder, "Computer Algorithms – Introduction to Design and Analysis", Pearson Education, 2003.
3.   A.V.Aho J.E., Hopcroft and J.D.Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education, 2003.

EC1207 – PRINCIPLES OF COMMUNICATION ENGINEERING

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UNIT I   AMPLITUDE MODULATION   9

Principles of Amplitude Modulation – AM Envelope – Frequency Spectrum and Bandwidth – Modulation Index and Percent Modulation – AM Power Distribution – AM Modulator Circuits – Low Level AM Modulator – Medium Power AM Modulator – AM Transmitters – Low Level Transmitters – High Level Transmitters – Receiver Parameters – AM Receivers – TRF – Super Heterodyne Receivers – Double Conversion AM Receivers.

UNIT II   ANGLE MODULATION   9

Angle Modulation – FM and PM Waveforms – Phase Deviation and Modulation Index – Frequency Deviation – Phase and Frequency Modulators and Demodulators – Frequency Spectrum of Angle Modulated Waves – Bandwidth Requirement – Broadcast Band FM – Average Power FM and PM Modulators – Direct FM and PM – Direct FM Transmitters – Indirect Transmitters – Angle Modulation Vs. Amplitude Modulation. FM Receivers FM Demodulators – PLL FM Demodulators – FM Noise Suppression – Frequency Vs. Phase Modulation.

UNIT III   DIGITAL MODULATION   9

Introduction – Binary PSK – DPSK – Differentially Encoded PSK – QPSK – M–Ary PSK – Binary FSK – MSK – GMSK – Duobinary Encoding – Performance Comparison of Various Systems of Digital Modulation.

UNIT IV   BASEBAND DATA TRANSMISSION   9

Sampling Theorem – Quadrature Sampling of Bandpass Signals – Reconstruction of Message from its Samples – Signal Distortion in Sampling – Discrete PAM Signals – Power Spectra of Discrete PAM Signals – ISI Nyquist Criterion for Distortion Less Base Band Binary Transmission – Eye Pattern – Baseband M–ary PAM Systems – Adaptive Equalization for Data Transmission.

UNIT V   SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES   9

Introduction – Pseudo–Noise Sequence – DS Spread Spectrum With Coherent Binary PSK – Processing Gain – FH Spread Spectrum – Multiple Access Techniques – Wireless Communications – TDMA And CDMA – Wireless Communication Systems – Source Coding of Speech for Wireless Communications.

L: 45 T: 15 Total: 60

TEXT BOOKS

1.   Wayne Tomasi, "Electronic Communication Systems Fundamentals Through Advanced", Pearson Education, 2001.
2.   Simon Haykin, "Digital Communications", John Wiley and Sons, 2003.

REFERENCES

1.   Simon Haykin, "Communication Systems", Fourth Edition, John Wiley and Sons, 2001.
2.   Taub and Schilling, "Principles of Communication Systems", Second Edition, TMH, 2003.
3.   Martin S.Roden, "Analog and Digital Communication System", Third Edition, PHI, 2002.
4.   Blake, "Electronic Communication Systems", Second Edition, Thomson Delman, 2002.

CS1252 – SYSTEM SOFTWARE

L T P
3 0 0

UNIT I   FUNDAMENTALS   8

System Software and Machine Architecture – The Simplified Instructional Computer (SIC) – Machine Architecture – Data and Instruction Formats – Addressing Modes – Instruction Sets – I/O and Programming.

UNIT II   ASSEMBLERS   10

Basic Assembler Functions – A Simple SIC Assembler – Assembler Algorithm and Data Structures – Machine Dependent Assembler Features – Instruction Formats and Addressing Modes – Program Relocation – Machine Independent Assembler Features – Literals – Symbol – Defining Statements – Expressions – One Pass Assemblers and Multi Pass Assemblers – Implementation Example – MASM Assembler.

UNIT III   LOADERS AND LINKERS   9

Basic Loader Functions – Design of Absolute Loader – Simple Bootstrap Loader – Machine Dependent Loader Features – Relocation – Program Linking – Algorithm and Data Structures for Linking Loader – Machine Independent Loader Features – Automatic Library Search – Loader Options – Loader Design Options – Linkage Editors – Dynamic Linking – Bootstrap Loaders – Implementation Example – MSDOS Linker.

UNIT IV   MACRO PROCESSORS   9

Basic Macro Processor Functions – Macro Definition and Expansion – Macro Processor Algorithm and Data Structures – Machine Independent Macro Processor Features – Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters – Macro within Macro –Implementation Example – MASM Macro Processor – ANSI C Macro Language.

UNIT V   SYSTEM SOFTWARE TOOLS   9

Text Editors – Overview of the Editing Process – User Interface – Editor Structure – Interactive Debugging Systems – Debugging Functions and Capabilities – Relationship with other Parts of the System – User Interface Criteria.

Total: 45

TEXT BOOK

1.   Leland L. Beck, "System Software - An Introduction to Systems Programming",Third Edition, Pearson Education, 2000.

REFERENCES

1.   D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 1999.
2.   John J. Donovan, "Systems Programming", Tata McGraw-Hill, 1972.

CS1253 – OPERATING SYSTEMS

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UNIT I   FUNDAMENTALS   9

Concepts – Mainframe Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems – Hardware Protection – System Components – Operating System Services – System Calls – System Programs.

UNIT II   PROCESS MANAGEMENT   9

Process Concept – Process Scheduling – Operations On Processes – Cooperating Processes – Inter Process Communication – Threads – Overview – Threading Issues – Cpu Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Real Time Scheduling – The Critical Section Problem – Synchronization Hardware – Semaphores – Classic Problems Of Synchronization – Critical Regions – Monitors.

UNIT III   DEADLOCKS   9

System Model – Deadlock Characterization – Methods for Handling Deadlocks –Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlocks.

UNIT IV   MEMORY AND FILE MANAGEMENT   9

Storage Management – Swapping – Contiguous Memory Allocation – Paging – Segmentation – Segmentation with Paging – Virtual Memory – Demand Paging – Process Creation – Page Replacement – Allocation of Frames – Thrashing – File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V   FILE AND I/O SYSTEMS   9

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free – Space Management. Kernel I/O Subsystems – Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System – Windows

L: 45 T: 15 Total: 60

TEXT BOOK

1.   Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", John Wiley and Sons, Sixth Edition, 2003.

REFERENCES

1.   Harvey M. Deitel, "Operating Systems", Second Edition, Pearson Education, 2002.
2.   Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India, 2003.
3.   William Stallings, "Operating System", Fourth Edition, Prentice Hall of India, 2003.

CS1254 – DATABASE MANAGEMENT SYSTEMS

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UNIT I FUNDAMENTALS AND CONCEPTUAL MODELING 9

File and Database Systems – Database System Structure – Data Models – Introduction to Network and Hierarchical Models – ER Model – Relational Model – Relational Algebra and Calculus.

UNIT II RELATIONAL MODEL 9

SQL – Data Definition – Queries in SQL – Updates – Views – Integrity and Security – Relational Database Design – Functional Dependencies and Normalization for Relational Databases (Upto BCNF).

UNIT III DATA STORAGE AND QUERY PROCESSING 9

Record Storage and Primary File Organization – Secondary Storage Devices – Operations on Files – Heap File – Sorted Files – Hashing Techniques – Index Structure for Files – Different Types of Indexes – B-Tree – B^+ Tree– Query Processing.

UNIT IV TRANSACTION MANAGEMENT 9

Transaction Processing – Introduction – Need For Concurrency Control – Desirable Properties Of Transaction – Schedule And Recoverability – Serializability And Schedules – Concurrency Control – Types Of Locks – Two Phases Locking – Deadlock – Time Stamp Based Concurrency Control – Recovery Techniques – Concepts – Immediate Update – Deferred Update – Shadow Paging.

UNIT V CURRENT TRENDS 9

Object Oriented Databases – Need For Complex Data Types – OO Data Model – Nested Relations – Complex Types – Inheritance Reference Types – Distributed Databases – Homogenous and Heterogenous – Distributed Data Storage – XML – Structure of XML – Data – XML Document – Schema – Querying and Transformation – Data Mining and Data Warehousing.

L: 45 T: 15 Total: 60

TEXT BOOK

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

REFERENCES

1. Ramez Elmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, "Database Management System", Tata McGraw-Hill, 2003.
3. Hector Garcia-Molina, Jeffrey D.Ullman and Jennifer Widom, "Database System Implementation", Pearson Education, 2000.
4. Peter Rob and Corlos Coronel, "Database System, Design, Implementation and Management", Fifth Edition,Thompson Learning Course Technology, 2003.

CS1255 – SYSTEM SOFTWARE LABORATORY

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1. Design of an Editor: Design of a Line or Screen Editor using C Language.

2. Design of an Assembler.

3. Simulation of Loaders.

4. Interprocess Communication.

5. Token Separation and Symbol Table Manipulation.

6. Construction of Parsing Table.

Total: 45

CS1256 – OPERATING SYSTEMS LABORATORY

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(Implement the following on LINUX platform. Use C for high level language implementation)

1. Shell Programming
   - Command Syntax
   - Write Simple Functions
   - Basic Tests
2. Shell Programming
   - Loops
   - Patterns
   - Expansions
   - Substitutions
3. Write Programs using the following System Calls of UNIX operating system:
   fork - exec - getpid - exit - wait - close - stat - opendir – readdir
4. Write programs using the I/O system calls of UNIX Operating System (open - read - write - etc)
5. Write C programs to simulate UNIX Commands like ls - grep - etc.
6. Given the list of processes - their CPU Burst Times and Arrival times - display/print the Gantt chart for FCFS and SJF. For each of the Scheduling Policies - compute and print the Average Waiting Time and Average Turn Around Time
7. Given the list of Processes - their CPU Burst Times and Arrival Times - display/print the Gantt chart for Priority and Round robin. For each of the Scheduling Policies - compute and print the average waiting time and average turnaround time

8. Implement the Producer - Consumer problem using Semaphores.

9. Implement some Memory Management Schemes - I
10. Implement some Memory Management Schemes - II

Example for experiment 9 and 10:

Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process id, starting byte address and the ending byte address of the allocated space.

When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

Total: 45

CS1257 – DATABASE MANAGEMENT SYSTEMS LABORATORY

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LIST OF EXPERIMENTS

1.   Data Definition Language (DDL) Commands in RDBMS.

2.   Data Manipulation Language (DML) and Data Control Language (DCL) Commands in RDBMS.

3.   High-Level Language extension with Cursors.

4.   High Level Language extension with Triggers

5.   Procedures and Functions.

6.   Embedded SQL.

7.   Database Design using E-R model and Normalization.

8.   Design and Implementation of Payroll Processing System.

9.   Design and Implementation of Banking System.

10.   Design and Implementation of Library Information System.

Total: 45

SEMESTER V

MA1301 – DISCRETE MATHEMATICS

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UNIT I   **PROPOSITIONAL CALCULUS**   **9**

Propositions − Logical Connectives − Compound Propositions − Conditional and Biconditional Propositions − Truth Tables − Tautologies and Contradictions − Contrapositive − Logical Equivalences and Implications − Demorgan's Laws − Normal Forms − Principal Conjunctive and Disjunctive Normal Forms − Rules of Inference − Arguments − Validity of Arguments.

UNIT II   **PREDICATE CALCULUS**   **9**

Predicates − Statement Function − Variables − Free and Bound Variables − Quantifiers − Universe of Discourse − Logical Equivalences and Implications for Quantified Statements − Theory of Inference − The Rules of Universal Specification and Generalization −Validity of Arguments.

UNIT III   **SET THEORY**   **9**

Basic Concepts − Notations − Subset − Algebra of Sets − The Power Set − Ordered Pairs and Cartesian Product − Relations on Sets − Types of Relations and their Properties − Relational Matrix and the Graph of a Relation − Partitions − Equivalence Relations − Partial Ordering − Poset − Hasse Diagram − Lattices and their Properties − Sublattices − Boolean Algebra − Homomorphism.

UNIT IV   **FUNCTIONS**   **9**

Definition of functions − Classification of Functions − Type of Functions − Examples − Composition of Functions − Inverse functions − Binary and n-ary Operations − Characteristic Function of a Set − Hashing Functions − Recursive Functions − Permutation Functions.

UNIT V   **GROUPS**   **9**

Algebraic Systems − Definitions − Examples − Properties − Semigroups − Monoids − Homomorphism − Sub Semigroups and Submonoids − Cosets and Lagrange's Theorem − Normal Subgroups −Normal Algebraic System with two Binary Operations − Codes and Group Codes − Basic Notions of Error Correction − Error Recovery in Group Codes.

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L: 45 T: 15 Total: 60

TEXT BOOKS

1. Trembly J.P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", TMH Pub. Co. Ltd, New Delhi, 2003.
2. Ralph P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, 2002.

REFERENCES

1. Bernard Kolman, Robert C. Busby and Sharan Cutler Ross, "Discrete Mathematical Structures", Fourth Indian reprint, Pearson Education Pvt Ltd., New Delhi, 2003.
2. Kenneth H. Rosen, "Discrete Mathematics and its Applications", Fifth Edition, TMH Pub. Co. Ltd., New Delhi, 2003.
3. Richard Johnsonbaugh, "Discrete Mathematics", Fifth Edition, Pearson Education Asia, New Delhi, 2002.

CS1301 − SOFTWARE ENGINEERING

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UNIT I   SOFTWARE PROCESS   9

Basics − S/W Engineering Paradigm − Life Cycle Models (Water Fall, Incremental, Spiral, WINWIN Spiral, Evolutionary, Prototyping, Object Oriented) − System Engineering − Computer Based System − Verification − Validation − Life Cycle Process − Development Process − System Engineering Hierarchy.

UNIT II   SOFTWARE REQUIREMENTS   9

Functional and Non-Functional Requirements − User − System − Requirement Engineering Process − Feasibility Studies − Requirements − Elicitation − Validation and Management − Software Prototyping − Prototyping in the Software Process − Rapid Prototyping Techniques − User Interface Prototyping − S / W Document − Analysis and Modeling − Data − Functional and Behavioral Models − Structured Analysis and Data Dictionary.

UNIT III   DESIGN CONCEPTS AND PRINCIPLES   9

Design Process and Concepts − Modular Design − Design Heuristic − Design Model and Document − Architectural Design − Software Architecture − Data Design − Architectural Design − Transform and Transaction Mapping − User Interface Design − User Interface Design Principles − Real Time Systems − Real Time Software Design − System Design − Real Time Executives − Data Acquisition System − Monitoring and Control System − SCM − Need for SCM − Version Control − Introduction to SCM Process − Software Configuration Items.

UNIT IV   TESTING   9

Taxonomy of Software Testing − Levels − Test Activities − Types of S/W Test − Black Box Testing − Testing Boundary Conditions − Structural Testing − Test Coverage Criteria Based on Data Flow Mechanisms − Regression Testing − Testing in the Large − S / W Testing Strategies − Strategic Approach and Issues − Unit Testing − Integration Testing − Validation Testing − System Testing and Debugging.

UNIT V   SOFTWARE PROJECT MANAGEMENT   9

Measures and Measurements − S/W Complexity and Science Measure − Size Measure − Data and Logic Structure Measure − Information Flow Measure − Software Cost Estimation − Function Point Models − COCOMO Model − Delphi Method − Defining a Task Network − Scheduling − Earned Value Analysis − Error Tracking − Software Changes − Program Evolution Dynamics − Software Maintenance − Architectural Evolution − Taxonomy of CASE Tools.

Total: 45

TEXT BOOK

1.   Roger S. Pressman, "Software Engineering A Practitioner's Approach", Fifth Edition, McGraw-Hill International Edition, 2001.

REFERENCES

1.   Ian Sommerville, "Software Engineering", Sixth Edition, Pearson Education Asia, 2000.
2.   Pankaj Jalote, "An Integrated Approach to Software Engineering", Springer Verlag, 1997.
3.   James F. Peters and Witold Pedryez, "Software Engineering−An Engineering Approach", John Wiley and Sons, New Delhi, 2000.
4.   Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxford University Press, New Delhi, 1996.

CS1302 – COMPUTER NETWORKS

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UNIT I   DATA COMMUNICATIONS   8

Components − Direction of Data flow − Networks − Components and Categories − Types of Connections − Topologies − Protocols and Standards − ISO/OSI Model − Transmission Media − Coaxial Cable − Fiber Optics − Line Coding − Modems − RS232 Interfacing Sequences.

UNIT II   DATA LINK LAYER   10

Error Detection and Correction − Parity − LRC − CRC − Hamming Code − Low Control and Error Control − Stop and Wait − Go Back − N ARQ − Selective Repeat ARQ-Sliding Window − HDLC − LAN − Ethernet IEEE 802.3 − IEEE 802.4 − IEEE 802.5 − IEEE 802.11 − FDDI − SONET − Bridges.

UNIT III   NETWORK LAYER   10

Internetworks − Packet Switching and Datagram Approach − IP Addressing Methods − Subnetting − Routing − Distance Vector Routing − Link State Routing − Routers.

UNIT IV   TRANSPORT LAYER   9

Duties of Transport Layer − Multiplexing − Demultiplexing − Sockets − User Datagram Protocol (UDP) − Transmission Control Protocol (TCP) − Congestion Control − Quality of Services (QOS) − Integrated Services.

UNIT V   APPLICATION LAYER   8

Domain Name Space(DNS) − SMTP − FTP − HTTP − WWW − Security − Cryptography.

Total: 45

TEXT BOOK

1.   Behrouz A. Forouzan, "Data Communication and Networking", TMH, 2004.

REFERENCES

1.   James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, 2003.
2.   Larry L. Peterson and Peter S. Davie, "Computer Networks", Second Edition, Harcourt Asia Pvt. Ltd, 2004.
3.   Andrew S. Tanenbaum, "Computer Networks", Fourth Edition, PHI, 2003.
4.   William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.
5.   Peterson,"Computer Networks : A System Approach", Fourth Edition, Elsevir India Pvt Ltd, 2007.

CS1303 – THEORY OF COMPUTATION

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UNIT I   AUTOMATA   9

Introduction to Formal Proof − Additional Forms of Proof − Inductive Proofs − Finite Automata (FA) − Deterministic Finite Automata (DFA) − Non-Deterministic Finite Automata (NFA) − Finite Automata with Epsilon Transitions.

UNIT II   REGULAR EXPRESSIONS AND LANGUAGES   9

Regular Expression − FA and Regular Expressions − Proving Languages not to be Regular − Closure Properties of Regular Languages − Equivalence and Minimization of Automata.

UNIT III   CONTEXT-FREE GRAMMAR AND LANGUAGES   9

Context Free Grammar(CFG) − Parse Trees − Ambiguity in Grammars and Languages − Definition of the Pushdown Automata − Languages of a Pushdown Automata − Equivalence of Pushdown Automata and CFG − Deterministic Pushdown Automata.

UNIT IV   PROPERTIES OF CONTEXT-FREE LANGUAGES   9

Normal Forms for CFG − Pumping Lemma for CFL − Closure Properties of CFL − Turing Machines − Programming Techniques for TM.

UNIT V   UNDECIDABILITY   9

A language that is not Recursively Enumerable(RE) − An Undecidable Problem that is RE − Undecidable Problems about Turing Machine − Post's Correspondence Problem − The classes P and NP.

Total: 45

TEXT BOOK

1. J.E. Hopcroft, R. Motwani and J.D Ullman, "Introduction to Automata Theory, Languages and Computations", Second Edition, Pearson Education, 2003.

REFERENCES

1. H. Lewis and C.H Papadimitriou, "Elements of the Theory of Computation", Second Edition, Pearson Education/PHI, 2003.
2. J. Martin, "Introduction to Languages and the Theory of Computation", Third Edition, TMH, 2003.
3. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.

EC1301 – MICROPROCESSORS AND MICROCONTROLLERS

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UNIT I   8085 MICROPROCESSOR   9

8085 Architecture – Instruction Set – Addressing Modes – Timing Diagrams – Assembly Language Programming – Counters – Time Delays – Interrupts – Memory Interfacing –Interfacing , I/O devices.

UNIT II   PERIPHERALS INTERFACING OF 8085   9

Interfacing Serial I/O (8251) – Parallel I/O (8255) – Keyboard and Display Controller (8279) – ADC/DAC Interfacing – Inter Integrated Circuits Interfacing (I^2C Standard) – Bus: RS232C – RS485 – GPIB

UNIT III   8086 MICROPROCESSOR   9

8086 Internal Architecture – 8086 Addressing modes – Instruction Set – 8086 Assembly Language Programming – Interrupts.

UNIT IV   8051 MICROCONTROLLER   9

8051 Micro Controller Hardware – I/O Pins, Ports and Circuits – External Memory –Counters and Timers – Serial Data I/O – Interrupts–Interfacing to External Memory and 8255.

UNIT V   8051 PROGRAMMING AND APPLICATIONS   9

8051 Instruction Set – Addressing Modes – Assembly Language Programming – I/O Port Programming – Timer and Counter Programming – Serial Communication – Interrupt Programming – 8051 Interfacing – LCD – ADC – Sensors – Stepper Motors – Keyboard and DAC.

L:45 T:15 Total: 60

TEXT BOOKS

1.   Ramesh S Gaonkar, "Microprocessor Architecture, Programming and application with 8085", Fourth Edition, PHI, New Delhi, 2000.
2.   John Uffenbeck, "The 80x86 Families, Design, Programming and Interfacing", Third Edition, Pearson Education, 2002.
3.   Mohammed Ali Mazidi and Janice Gillispie Mazidi, "The 8051 Microcontroller and Embedded Systems", Pearson Education Asia, New Delhi, 2003.

REFERENCES

1.   A.K. Ray and K.M.Burchandi, "Intel Microprocessors Architecture Programming and Interfacing", TMH International Edition, 2000
2.   Kenneth J Ayala, "The 8051 Microcontroller Architecture Programming and Application", Second Edition, Penram International Publishers (India), New Delhi, 1996.
3.   M. Rafiquzhman, "Microprocessors Theory and Applications: Intel and Motorola", PHI Pvt. Ltd., New Delhi, 2003.

CS1304 – VISUAL PROGRAMMING

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UNIT I WINDOWS PROGRAMMING 9

Windows Environment − A Simple Windows Program − Windows and Messages − Creating the Window − Displaying the Window − Message Loop − The Window Procedure − Message Processing − Text Output − Painting and Repainting − Introduction to GDI − Device Context − Basic Drawing − Child Window Controls.

UNIT II VISUAL C++ PROGRAMMING−FUNDAMENTALS 9

Application Framework − MFC Library − Visual C++ Components − Event Handling − Mapping Modes − Colors − Fonts − Modal and Modeless Dialog − Windows Common Controls – Bitmaps.

UNIT III THE DOCUMENT AND VIEW ARCHITECTURE 9

Menus − Keyboard Accelerators − Rich Edit Control − Toolbars − Status Bars − Reusable Frame Window Base Class − Separating Document from its View − Reading and Writing SDI and MDI Documents − Splitter Window and Multiple Views − Creating DLLs − Dialog Based Applications.

UNIT IV ACTIVEX AND OBJECT LINKING AND EMBEDDING (OLE) 9

ActiveX Controls Vs Ordinary Windows Controls − Installing ActiveX Controls − Calendar Control − ActiveX Control Container Programming − Create ActiveX Control at Runtime − Component Object Model (COM) − Containment and Aggregation Vs Inheritance − OLE Drag and Drop − OLE Embedded Component and Containers − Sample Applications.

UNIT V ADVANCED CONCEPTS 9

Database Management with Microsoft ODBC − Structured Query Language − MFC ODBC Classes − Sample Database Applications − Filter and Sort Strings − DAO Concepts − Displaying Database Records in Scrolling View − Threading − VC++ Networking Issues − Winsock − WinInet − Building a Web Client − Internet Information Server − ISAPI Server Extension − Chat Application − Playing and Multimedia (Sound and Video) Files.

L: 45 T: 15 Total: 60

TEXT BOOKS

1.   Charles Petzold, "Windows Programming", Microsoft Press, 1996.
        David J. Kruglinski, George Shepherd and Scot Wingo, "Programming Visual C++", Microsoft press, 1999.

REFERENCES

1.   Steve Holtzner, "Visual C++ 6 Programming", Wiley Dreamtech India Pvt. Ltd., 2003.
2.   Mueller and John, "Visual C++ from the Ground Up", Second Edition, Tata McGraw Hill, 1999.
3.   Bates and Tompkins, "Practical Visual C++", Prentice Hall of India, 2002.

CS1305 – NETWORK LABORATORY

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LIST OF EXPERIMENTS

(All the programs are to be written using C)

1. Simulation of ARP/RARP.

2. A program that takes a binary file as input and performs bit stuffing and CRC Computation.

3. An application for transferring files over RS232.

4. Simulation of Sliding-Window protocol.

5. Simulation of BGP / OSPF routing protocol.

6. A Client–Server application for chat.

7. A Client that contacts a given DNS Server to resolve a given host name.

8. A Client to download a file from a HTTP Server.

9 & 10. Study of Network Simulators like NS2 / Glomosim / OPNET.

Total: 45

EC1305 – MICROPROCESSORS AND MICROCONTROLLERS LABORATORY

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LIST OF EXPERIMENTS

1.   Programs for 8/16 Bit Arithmetic Operations (Using 8085).

2.   Programs for Sorting and Searching (Using 8085, 8086).

3.   Programs for String Manipulation Operations (Using 8086).

4.   Programs for Digital Clock and Stop Watch (Using 8086).

5.   Interfacing ADC and DAC.

6.   Parallel Communication between Two Microprocessor Kits using Mode 1 and Mode 2 of 8255.

7.   Interfacing and Programming 8279, 8259, and 8253.

8.   Serial Communication between Two Microprocessor Kits using 8251.

9.   Interfacing and Programming of Stepper Motor and DC Motor Speed control.

10.   Programming using Arithmetic, Logical and Bit Manipulation Instructions of 8051Microcontroller.

11.   Programming and Verifying Timer, Interrupts and UART Operations in 8031 Microcontroller.

12.   Communication between 8051 Microcontroller kit and PC.

Total: 45

CS1306 − VISUAL PROGRAMMING LABORATORY

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LIST OF EXPERIMENTS

WINDOWS SDK / VISUAL C++

1.   Writing code for keyboard and mouse events.

2.   Dialog Based applications.

3.   Creating MDI applications.

VISUAL C++

4.   Threads.

5.   Document view Architecture, Serialization.

6.   Dynamic controls.

7.   Menu, Accelerator, Tool tip, Tool bar.

8.   Creating DLLs and using them.

9.   Data access through ODBC.

10.   Creating ActiveX control and using it.

Total: 45

SEMESTER VI

MA1251 – NUMERICAL METHODS

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UNIT I   SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS   9

Solutions of Algebraic and Transcendental Equations **:**Method of False Position − Newton's method − Statement of fixed point theorem − Fixed point iteration: x=G(x) method − Solution of linear system by Gaussian elimination and Gauss-Jordon methods − Iterative methods: Gauss Jacobi and Gauss-Seidel methods − Inverse of a matrix by Gauss Jordon method – Eigen value of a matrix by power method.

UNIT II   INTERPOLATION AND APPROXIMATION   9

Lagrangian polynomials − Divided differences − Interpolating with a cubic spline − Newton's forward and backward difference formulas.

UNIT III   NUMERICAL DIFFERENTIATION AND INTEGRATION   9

Derivatives from difference tables Divided differences and finite differences − Numerical integration by Trapezoidal and Simpson's 1/3 and 3/8 rules − Romberg's method − Two and three point Gaussian Quadrature formulas − Double integrals using Trapezoidal and Simpson's rules.

**UNIT IV   INITIAL   VALUE   PROBLEMS   FOR   ORDINARY
                    DIFFERENTIAL EQUATIONS   9**

Single step methods − Taylor series method − Euler's and modified Euler's methods − Fourth order Runge−Kutta method for solving first and second order differential equations − Multistep methods : Milne's and Adam's predictor and corrector methods.

**UNIT V   BOUNDARY   VALUE   PROBLEMS   IN   ORDINARY   AND   PARTIAL
                    DIFFERENTIAL EQUATIONS   9**

Finite difference solution of second order ordinary differential equation − Finite difference solution of one dimensional heat equation by explicit and implicit methods − One dimensional wave equation and two dimensional Laplace and Poisson equations.

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TEXT BOOK

1.   Gerald, C.F. and Wheatley, P.O., "Applied Numerical Analysis", 7th Edition, Pearson Education, 2007.

REFERENCES

1.   Jain, M.K., Iyengar, S.R.K. and Jain, R.K., "Numerical Methods for Scientific and Engineering Computation" 4th Edition, New Age International Publishers, 2003.
2   Venkatraman, M.K., 'Numerical Methods', National Publication Company, 1991.
3.   Kandasamy, P., Thilakavthy, K. and Gunavathy, K., "Numerical Methods", 2nd Edition, S.Chand and Co., 2003.

CS1351 − ARTIFICIAL INTELLIGENCE

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UNIT I   AGENTS AND SEARCHING   8

Intelligent agents − Agents and environments − Good behavior − The nature of environments − Structure of agents − Problem solving − Problem solving agents − Example problems − Searching for solutions − Uniformed search strategies − Avoiding repeated states − Searching with partial information.

UNIT II   SEARCHING TECHNIQUES   10

Informed search and exploration − Informed search strategies − Heuristic function − Local search algorithms and optimistic problems − Local search in continuous spaces − Online search agents and unknown environments − Constraint Satisfaction Problems (CSP) − Backtracking search and local search for CSP − Structure of problems − Adversarial search − Games − Optimal decisions in games − Alpha-Beta pruning − Imperfect real-time decision − Games that include an element of chance.

UNIT III   KNOWLEDGE REPRESENTATION   10

First order logic − Representation revisited − Syntax and semantics for first order logic − Using first order logic − Knowledge engineering in first order logic − Inference in first order logic − Prepositional versus first order logic − Unification and lifting − Forward chaining − Backward chaining − Resolution − Knowledge representation − Ontological engineering − Categories and objects − Actions − Simulation and events − Mental events and mental objects.

UNIT IV   LEARNING   9

Learning from observations − Forms of learning − Inductive learning − Learning decision trees − Ensemble learning − Knowledge in learning − Logical formulation of learning − Explanation based learning − Learning using relevant information − Inductive logic programming − Statistical learning methods − Learning with complete data − Learning with hidden variable − EM algorithm − Instance based learning − Neural networks − Reinforcement learning − Passive reinforcement learning − Active reinforcement learning − Generalization in reinforcement learning.

UNIT V   APPLICATIONS   8

Communication − Communication as action − Formal grammar for a fragment of english − Syntactic analysis − Augmented grammars − Semantic interpretation − Ambiguity and disambiguation − Discourse understanding − Grammar induction − Probabilistic language processing − Probabilistic language models − Information retrieval − Information extraction − Machine translation.

Total: 45

TEXT BOOK

1.   Russell, S. and Norvig, P., "Artificial Intelligence-A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

REFERENCES

1.   Nilsson, N.J., "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
2.   Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.
3.   Luger, G.F., "Artificial Intelligence − Structures and Strategies for Complex Problem Solving", Pearson Education / Prentice Hall of India, 2002.

CS1352 – PRINCIPLES OF COMPILER DESIGN

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UNIT I   INTRODUCTION TO COMPILING   9

Compilers − Analysis of the source program − Phases of a compiler − Cousins of the compiler − Grouping of phases − Compiler construction tools − Lexical analysis − Role of lexical analyzer − Input buffering − Specification of tokens.

UNIT II   SYNTAX ANALYSIS   9

Role of the parser − Writing grammars − Context-free grammars − Top down parsing − Recursive descent parsing − Predictive parsing − Bottom-up parsing − Shift reduce parsing − Operator precedence parsing − LR parsers − SLR parser − Canonical LR parser − LALR parser.

UNIT III   INTERMEDIATE CODE GENERATION   9

Intermediate languages − Declarations − Assignment statements − Boolean expressions − Case statements − Back patching − Procedure calls.

UNIT IV   CODE GENERATION   9

Issues in the design of code generation − The target machine − Runtime storage management − Basic blocks and flow graphs − Next-use information − A simple code generator − DAG representation of basic blocks − Peephole optimization.

UNIT V   CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS   9

Basics − Principal sources of optimization − Optimization of basic blocks − Introduction to global data flow analysis − Runtime environments − Source language issues − Storage organization − Storage allocation strategies − Access to non-local names − Parameter passing.

L:45 T:15 Total: 60

TEXT BOOKS
1.   Alfred Aho, Ravi Sethi and Ullman, J.D., "Compilers Principles, Techniques and Tools", Pearson Education, 2003.
2.   Louden, K.C., "Compiler Construction: Principles and Practice", Thompson Learning, 2003.

REFERENCES
1.   Fischer, C. N. and LeBlanc, R. J., "Crafting a compiler with C", Benjamin Cummings, 2003.
2.   Bennet, J.P., "Introduction to Compiler Techniques", 2nd Edition, TMH, 2003.
3.   Henk Alblas and Albert Nymeyer, "Practice and Principles of Compiler Building with C", Prentice Hall of India, 2001.

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UNIT I   BASIC CONCEPTS   9

Characterization of distributed systems − Examples − Resource sharing and the web − Challenges − System models − Architectural and fundamental models − Networking and internetworking − Types of networks − Network principles − Internet protocols − Case studies.

UNIT II   PROCESSES AND DISTRIBUTED OBJECTS   9

Interprocess communication − The API for the Internet protocols − External data representation and marshalling − Client-server communication − Group communication − Case study − Distributed objects and remote invocation − Communication between distributed objects − Remote procedure call − Events and notifications − Java RMI − Case study.

UNIT III   OPERATING SYSTEM ISSUES I   9

The OS layer − Protection − Processes and threads − Communication and invocation − OS architecture − Security − Overview −Cryptographic algorithms − Digital signatures − Cryptography pragmatics − Case studies − Distributed file systems − File service architecture − Sun network file system − The Andrew file system.

UNIT IV   OPERATING SYSTEM ISSUES II   9

Name services − Domain name system − Directory and discovery services − Global name service − X.500 directory service − Clocks − Events and process states − Synchronizing physical clocks − Logical time and logical clocks − Global states − Distributed debugging − Distributed mutual exclusion − Elections − Multicast communication related problems.

UNIT V   DISTRIBUTED TRANSACTION PROCESSING   9

Transactions − Nested transactions − Locks − Optimistic concurrency control − Timestamp ordering − Comparison − Flat and nested distributed transactions − Atomic commit protocols − Concurrency control in distributed transactions − Distributed deadlocks − Transaction recovery − Overview of replication and distributed multimedia systems.

                                                          L: 45 T: 15   Total: 60

TEXT BOOKS
1.   Coulouris, G., Dollimore, J. and Kindberg, T., "Distributed Systems Concepts and Design", 3rd Edition, Pearson Education, 2002.
2.   Tanenbaum, A.S. and Steen, M., "Distributed Systems-Principles and Pardigms", Pearson Education, 2002.

REFERENCES
1.   Mullender, S., "Distributed Systems", 2nd Edition, Addison Wesley, 1993.
2.   Fleishman, A., "Distributed Systems: Software Design and Implementation", Springer Verlag, 1994.
3.   Liu, M.L., "Distributed Computing Principles and Applications", Pearson Education, 2004.

CS1354 – GRAPHICS AND MULTIMEDIA

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UNIT I   OUTPUT PRIMITIVES   9

Basics − Line − Curve and ellipse drawing algorithms − Attributes − Two-dimensional geometric transformations − Two-dimensional clipping and viewing – Input Techniques.

UNIT II   THREE-DIMENSIONAL CONCEPTS   9

Three-dimensional object representations − Three-dimensional geometric and modeling transformations − Three-dimensional viewing − Hidden surface elimination − Color models − Animation.

UNIT III   MULTIMEDIA SYSTEMS DESIGN   9

Multimedia basics − Multimedia applications − Multimedia system architecture − Evolving technologies for multimedia − Defining objects for multimedia systems − Multimedia data interface standards − Multimedia databases.

UNIT IV   MULTIMEDIA FILE HANDLING   9

Compression and decompression − Data and file format standards − Multimedia I/O technologies − Digital voice and audio − Video image and animation − Full motion video − Storage and retrieval technologies.

UNIT V   HYPERMEDIA   9

Multimedia authoring and user interface − Hypermedia messaging − Mobile messaging − Hypermedia message component − Creating hypermedia message − Integrated multimedia message standards − Integrated document management − Distributed multimedia systems.

Total: 45

TEXT BOOKS

1.   Hearn, D. and Baker, M.P., "Computer Graphics C Version", Pearson Education, 2003.
2.   Andleigh, P.K. and Thakrar, K., "Multimedia Systems and Design", Prentice Hall of India, 2003.

REFERENCES

1.   Judith Jeffcoate, "Multimedia in Practice: Technology and Applications", Prentice Hall of India,1998.
2.   Foley, Vandam, Feiner and Huges, "Computer Graphics: Principles and Practice", 2nd Edition, Pearson Education, 2003.

HS1201 − ENVIRONMENTAL SCIENCE AND ENGINEERING

L T P
3 0 0

UNIT I   IMPORTANCE OF ENVIRONMENTAL STUDIES   9

Definition − Scope and importance − Need for public awareness − Forest resources − Water resources − Mineral resources − Land resources − Energy resources − Food resources − Equitable use of resources for sustainable lifestyles.

UNIT II   ECOSYSTEMS AND BIO DIVERSITY   9

Concept of ecosystem − Structure and function of an ecosystem − Energy flow in the ecosystem − Food chains − Food webs − Ecological pyramids − Definition of bio-diversity − Bio-geographical classification in India − Value of bio-diversity − Bio-diversity at global − National and local levels − India as a mega diversity nation − Hot spots of bio diversity − Threats to bio-diversity − Conservation of bio-diversity.

UNIT III   ENVIRONMENTAL POLLUTION   9

Definition − Causes and effects of environmental pollution − Air pollution − Water pollution − Soil pollution − Marine pollution − Noise pollution − Thermal pollution − Nuclear hazards − Solid waste management − Societal role in pollution prevention − Environmental disasters and management.

UNIT IV   SOCIAL ISSUES AND THE ENVIRONMENT   9

Unsustainable to sustainable development − Concept of conservation − Water and energy conservation − Rain water harvesting − Climate change − Global warning − Acid rain − Ozone layer depletion − Nuclear accidents and holocaust − Environmental protection act − Issues involved in enforcement of environmental legislation − Public awareness.

UNIT V   HUMAN POPULATION AND THE ENVIRONMENT   9

Population growth − Population explosion − Family welfare programme − Environment and human health − Human rights − Value education − HIV/ AIDS − Women and child welfare − Role of IT in environment and human health.

Total: 45

TEXT BOOKS

1.   Masters, G.M., "Introduction to Environmental Engineering and Science", 2nd Edition, Pearson Education, 2004.
2.   Miller Jr, T.G., "Environmental Science Working with the Earth", Thomson Learning, 2000.
3.   Trivedi, R.K. and Goel, P.K., "Introduction to Air Pollution", Techno-Science Publications, 2000.

REFERENCES

1.   Bharucha Erach, "The Biodiversity of India", Mapin Publishing Ahmedabad, 2000.
2.   Trivedi, R.K., "Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards", Vol. I and II, Environ Media.
3.   Cunningham, W.P. Copper and Gorhani, T.H., "Environmental Encyclopaedia", Jaico Publishers, 2001.

CS1355 – COMPILER DESIGN LABORATORY

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LIST OF EXPERIMENTS

1 &2.	Implement a lexical analyzer in "C".
3.	Use LEX tool to implement a lexical analyzer.
4.	Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.
5.	Use YACC and LEX to implement a parser for the same grammar as given in problem
6.	Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and * and computes and prints its value.
7 &8.	Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.
9 &10.	Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.

CS1356 – GRAPHICS AND MULTIMEDIA LABORATORY

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LIST OF EXPERIMENTS

1. To implement Bresenham's algorithms for line, circle and ellipse drawing.
2. To perform 2D Transformations such as translation, rotation, scaling, reflection and sharing.
3. To implement Cohen-Sutherland 2D clipping and window-viewport mapping.
4. To perform 3D Transformations such as translation, rotation and scaling.
5. To visualize projections of 3D images and Hidden Surface Elimination.
6. To convert between color models.
7. To implement text compression algorithm.
8. To implement image compression algorithm.
9. To perform animation using any Animation software.
10. To perform basic operations on image using any image editing software.

Total: 45

HS1301 – COMMUNICATION AND SOFT SKILLS LABORATORY

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(Common to All Branches of III Year B.E. / B.Tech students of Anna University Tiruchirappalli and affiliated colleges)

The aim of the course is two-fold: to enable the students to develop communication skills in the language laboratory and to arrange discussions for developing soft skills in the lab and/or the classroom. Each lab session shall last for three periods.

List of activities that are to be carried out: (15 sessions x 3 periods = 45)

Lab session # 1: Listening and speaking practice exercises with communicative functions. Learning material: the ACD of Spoken English: A Foundation Course for Speakers of Indian Languages (Orient Longman, 2008)

Lab session # 2: Practice with more advanced communicative functions. Learning material: the ACD of Spoken English: A Foundation Course for Speakers of Indian Languages (Orient Longman, 2008)

Lab session # 3: Pronunciation exercises with Oxford Advanced Learners' Dictionary of Current English or any other standard Dictionary

Lab session # 4: Making an oral presentation in English. Learning Material: Professional Presentations VCD (Cambridge University Press)

Lab session # 5: Listening to telephone conversations in English and completing the tasks. Learning material: Essential Telephoning in English ACD (Cambridge University Press)

Lab session # 6: Giving an exposure to and practice with model group discussion and interviews. Learning material: How to Prepare for Group Discussion and Interview Audio Cassette (McGraw-Hill)

Lab session # 7: Giving insights into the format and the task types in the IELTS (International English Language Testing System). Learning Material: Objective IELTS, Intermediate Level (CUP)

Lab session # 8: Understanding the format and the task types in the TOEFL (Test of English as a Foreign Language). Learning Material: Understanding the TOEFL (Educational Testing Services, Princeton)

Lab session # 9: Administering the BEC (Business English Certificate) Diagnostic Test. Learning Material: BEC Practice Materials (British Council, Chennai)

Lab session # 10: Completing the steps involved in Career, Life Planning and Change Management. Learning Material: Developing Soft Skills (Pearson Education)

Lab session # 11: Setting goals and objectives exercises. Learning Material: Developing Soft Skills (Pearson Education)

Lab session # 12: Prioritizing and time planning exercises. Learning Material: Managing Time Multimedia Program CD

Lab session # 13: Taking a Personality Typing/ Psychometric Test Learning Material: 200 Psychometric Test prepared by the CUIC, Anna University Chennai

Lab session # 14: Critical and creative thinking exercises.

Lab session # 15: Improving body language and cross-cultural communication with pictures. Learning material: Body Language (S. Chand and Co.)

For a detailed plan, refer to the topics given below;

UNIT I   LISTENING AND SPEAKING PRACTICE IN COMMUNICATIVE FUNCTIONS

Introductions and meetings – Talking about studies and or job – Expressing likes and dislikes – Describing daily routines and current activities – Talking about past states and events – Talking about future plans and intentions – Expressing preferences – Giving reasons – Expressing opinions, agreement and disagreement – Seeking and giving advice – Making suggestions.

UNIT II   SPEAKING APPLICATIONS

Making an oral presentation – Preparing the presentation – Performing the presentation – Beginning – Language – Visual aids and body language – Voice – Ending – Questions – Telephone conversations – Group discussion and interview.

UNIT III   UNDERSTANDING AND PREPARING FOR INTERNATIONAL   ENGLISH LANGUAGE EXAMINATIONS

International English Language Testing System (IELTS) – Test of English as a Foreign Language (TOEFL) – Business English Certificate (BEC).

UNIT IV   SOFT SKILLS (1)

Preparing for and dealing with change – Motivation, goal-setting and self-esteem – Managing time and stress – Career and life planning – Team work – Leadership traits.

UNIT V   SOFT SKILLS (2)

Multiple intelligences – Learning styles and personality typing – Critical and creative thinking – People, cultures and self – Intercultural communication.

RESOURCES

1. Kamalesh Sadanand and Susheela Punitha, "Spoken English**:** A Foundation Course" for Speakers of Indian Languages, Part 2 Audio CD, Hyderabad: Orient Longman, 2008.
2. Malcome Goodale, "Professional Presentations", (VCD) New Delhi: Cambridge University Press, 2005.
3. Barbara Garside and Tony Garside, "Essential Telephoning in English (Audio CD)", Cambridge: Cambridge University Press, 2002.
4. Hari Mohan Prasad and Rajnish Mohan, "How to Prepare for Group Discussion and Interview **(**Audio Cassette)", Tata McGraw-Hill Publishing.
5. International English Language Testing System Practice Tests, CUP.
6. Business English Certificate Materials, Cambridge University Press.
7. Understanding the TOEFL**.** Educational Testing Services, Princeton, US.
8. Interactive Multimedia Programs on Managing Time and Stress.
9. Robert M. Sherfield and et al, "Developing Soft Skills", 4th Edition, Pearson Education, 2009.

L: 15 P: 45 Total: 60

SEMESTER VII

CS1401 – INTERNET COMPUTING

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UNIT I   FUNDAMENTALS   9
Introduction – Network concepts – Web concepts – Internet addresses – Retrieving data with URL – HTML – DHTML cascading style sheets – Scripting languages javascript – VBscript.

UNIT II   SERVER SIDE PROGRAMMING   9
Server side programming – Active server pages – Java server pages – Java servlets – Servlet container – Exceptions – Sessions and session tracking – Using servlet context – Dynamic content generation – Servlet chaining and communications.

UNIT III   XML TECHNOLOGY FAMILY   9
XML – Benefits – Advantages of XML over HTML – EDI – Databases – XML based standards – DTD – XML Schemas – X – Files – XML processing – DOM – SAX – Presentation technologies – XSL – XFORMS – XHTML – voice XML – Transformation – XSLT – XLINK – XPATH – XQ.

UNIT IV   SOAP   9
Overview of SOAP – HTTP – XML – RPC – SOAP – Protocol – Message structure – Intermediaries – Actors – Design patterns and faults – SOAP with attachments.

UNIT V   WEBSERVICES   9
Overview – Architecture – Key technologies – UDDI – WSDL – ebXML – SOAP and web services in E–Com – Overview of .NET And J2EE

Total: 45

TEXT BOOKS
1.   Marty Hall, "Core Web Programming", 2nd Edition, Sun Microsystems Press, 2001.
2.   Frank P. Coyle, "XML Web Services and the Data Revolution", Pearson Education, 2002.

REFERENCES
1.   Eric Ladd and Jim O'Donnell, "Using HTML 4, XML, and JAVA1.2", PHI Publications, 2003.
2.   Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.
3.   McGovern, "Java Web Services Architecture", Morgan Kaufmann Publishers, 2005.

CS1361 – OBJECT ORIENTED ANALYSIS AND DESIGN

(Common to CSE 7th semester and IT 6th semester)

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UNIT I   BASIC CONCEPTS   8

An overview of object oriented systems development − Object basics − Object oriented systems development life cycle.

UNIT II   OBJECT ORIENTED METHODOLOGIES   12

Rumbaugh methodology − Booch methodology − Jacobson methodology − Patterns − Frameworks − Unified approach − Unified modeling language − Use case − Class diagram − Interactive diagram − Package diagram − Collaboration diagram − State diagram − Activity diagram.

UNIT III   OBJECT ORIENTED ANALYSIS   9

Identifying use cases − Object analysis − Classification − Identifying object relationships − Attributes and methods.

UNIT IV   OBJECT ORIENTED DESIGN   8

Design axioms − Designing classes − Access layer − Object storage − Object interoperability.

UNIT V   SOFTWARE QUALITY AND USABILITY   8

Designing interface objects − Software quality assurance − System usability − Measuring user satisfaction.

                                                                                                          Total: 45

TEXT BOOKS
1.   Ali Bahrami, "Object Oriented Systems Development", Tata McGraw-Hill, 1999.
2.   Martin Fowler, "UML Distilled", 2nd Edition, PHI/Pearson Education, 2002.

REFERENCES
1.   Stephen R. Schach, "Introduction to Object Oriented Analysis and Design",
        Tata McGraw-Hill, 2003.
2.   James Rumbaugh, Ivar Jacobson and Grady Booch "The Unified Modeling Language Reference Manual", Addison Wesley, 1999.
3.   Hans-Erik Eriksson, Magnus Penker, Brain Lyons and David Fado, "UML Toolkit", OMG Press Wiley Publishing Inc., 2004.
4.   Barclay, "Object Oriented Design with UML and Java", Elsevir, 2008.

CS1402 – MIDDLEWARE TECHNOLOGIES
(Common to CSE and IT)

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UNIT I   CLIENT / SERVER CONCEPTS   9

Client-Server − File server − Database server − Group server − Object server − Web server − Middleware − General middleware − Service specific middleware − Client / server building blocks − RPC − Messaging − Peer-to-Peer.

UNIT II   EJB ARCHITECTURE   9

EJB − EJB architecture − Overview of EJB software architecture − View of EJB − Conversation − Building and deploying   EJBs − Roles in EJB.

UNIT III   EJB APPLICATIONS   9

EJB session beans − EJB entity beans − EJB clients − EJB deployment − Building an application with EJB.

UNIT IV   CORBA   9

CORBA − Distributed systems − Purpose − Exploring CORBA alternatives − Architecture overview − CORBA and networking model − CORBA object model − IDL − ORB − Building an application with CORBA.

UNIT V   COM   9

COM − Data types − Interfaces − Proxy and stub − Marshalling − Implementing server/client − Interface pointers − Object creation − Invocation − Destruction − Comparison COM and CORBA − Introduction to .NET − Overview of .NET architecture − Marshalling − Remoting.

Total: 45

TEXT BOOKS
1.   Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client / Server   Survival Guide", Galgotia Publications Pvt. Ltd., 2002.
2.   Tom Valesky, "Enterprise Java Beans", Pearson Education, 2002.

REFERENCES
1.   Mowbray, "Inside CORBA", Pearson Education, 2002.
2.   Jeremy Rosenberger, "Teach Yourself CORBA in 14 days", TEC Media, 2000.
3.   Jason Pritchard, "COM and CORBA Side by Side", Addison Wesley, 2000.
4.   Jesse Liberty, "Programming C#", 2nd Edition, O'Reilly Press, 2002.

MG1352 – TOTAL QUALITY MANAGEMENT
(Common to Biomedical, CSE, ECE and IT)

	L	T	P
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UNIT I   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.

UNIT II   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.

UNIT III   STATISTICAL PROCESS CONTROL (SPC)   9
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.

UNIT IV   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.

UNIT V   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 BOOKS
1. Besterfiled, D.H., "Total Quality Management", 3rd Edition, Pearson Education, 2004.
2. Narayana, V. and Sreenivasan N.S., "Quality Management-Concepts and Tasks", New Age International, 1996.

REFERENCES
1. Evans, J.R. and Lidsay, W.M., "The Management and Control of Quality", South-Western (Thomson Learning), 5th Edition, 2002.
2. Feigenbaum, A.V., "Total Quality Management", McGraw Hill, 1991.
3. Oakland, J.S., "Total Quality Management", Butterworth-Hcinemann Ltd., 1989.

CS1403 – CASE TOOLS LABORATORY

$$\begin{array}{ccc} \textbf{L} & \textbf{T} & \textbf{P} \\ \textbf{0} & \textbf{0} & \textbf{3} \end{array}$$

Objective :

To learn and practice the various functionalities of appropriate Case Tools for the following Software Engineering concepts

1.   **Problem Statement** Thorough study of the problem-Identify project scope, Objectives and infrastructure.

2.   **Business modeling and requirements specification** The specification   language   Unified Modeling Language (UML) will be used.

3.   **UML** Use work products-data dictionary, use case diagrams and activity   diagrams, build and test, class diagrams, sequence diagrams, collaboration   diagrams and add interface to class diagrams.

4.   **Software Implementation** Coding-Use tools for automatic code generation from system specifications.

5.   **Software Testing** Prepare test plan, perform validation testing, coverage   analysis,   memory leaks, develop test case hierarchy, Site check and site monitor.

6.   **Change Management** Program, Data and Documentation management

7.   **Reverse Engineering** Apply Reverse Engineering approach and compare with   the forward engineering approach. Prepare documents and reports.

Note :

Here the emphasis is based on equipping / training the student in applying Object Oriented Analysis and Design (OOAD) techniques using UML in a CASE tools environment such as StarUML, Rational Rose etc.,

Total : 45

CS1404 – MIDDLEWARE TECHNOLOGIES LABORATORY
(Common to CSE and IT)

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LIST OF EXPERIMENTS

1. Create a distributed application to download various files from various servers using RMI.
2. Create a Java Bean to draw various graphical shapes and display it using or without using BDK.
3. Develop an Enterprise Java Bean for Banking operations.
4. Develop an Enterprise Java Bean for Library operations.
5. Create an Active-X control for File operations.
6. Develop a component for converting the currency values using COM / .NET.
7. Develop a component for encryption and decryption using COM / .NET.
8. Develop a component for retrieving information from message box using DCOM / .NET.
9. Develop a middleware component for retrieving Stock Market Exchange information using CORBA.
10. Develop a middleware component for retrieving Weather Forecast information using CORBA.

Total: 45

CS1405 – SOFTWARE DEVELOPMENT LABORATORY

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Objective :

To emphasize on software industry practices to acquire the knowledge about software development. Take up a software development project of your choice and systematically carry-out all the phases of Software Development Life Cycle (SDLC). Do the necessary documentation at each stage. Use your own choice of case tools.

In order to carry out the below mentioned project use appropriate Front end and Back end tools:

1.   Student Marks Analyzing System.
2.   Online stock trading.
3.   Airport management.
4.   Bio-informatics.
5.   Hospital management.
6.   Internet-based multi-user online games.
7.   Programmer's editor with syntax-based coloring.
8.   Quiz System
9.   ATM System
10.   Library of computer security related algorithms.

Total : 45

SEMESTER VIII

EC1411 – MOBILE COMPUTING
(Common to CSE 8th Semester and IT 7th Semester)

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UNIT I   WIRELESS COMMUNICATION FUNDAMENTALS   9

Basics − Wireless transmission − Frequencies for radio transmission − Signals − Antennas − Signal propagation − Multiplexing − Modulations − Spread spectrum − MAC − SDMA − FDMA − TDMA − CDMA − Cellular wireless networks.

UNIT II   TELECOMMUNICATION NETWORKS   11

Telecommunication systems − GSM − GPRS − DECT − UMTS − IMT- 2000 − Satellite networks − Basics − Parameters and configurations − Capacity allocation − FAMA and DAMA − Broadcast systems − DAB − DVB.

UNIT III   WIRLESS LAN   9

Wireless LAN − IEEE 802.11 − Architecture − Services − MAC − Physical layer − IEEE 802.11a − 802.11b standards − HIPERLAN − Blue tooth.

UNIT IV   MOBILE NETWORK LAYER   9

Mobile IP − Dynamic host configuration protocol − Routing − DSDV − DSR − Alternative metrics.

UNIT V   TRANSPORT AND APPLICATION LAYERS   7

Traditional TCP − Classical TCP improvements − WAP, WAP 2.0.

Total : 45

TEXT BOOKS
1.   Jochen Schiller, "Mobile Communications", 2nd Edition, PHI/Pearson Education, 2003.
2.   William Stallings, "Wireless Communications and Networks", PHI/Pearson Education, 2002.

REFERENCES
1.   Kaveh Pahlavan and Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
2.   Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, 2003.
3.   Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and
        Sons Ltd, 2002.
4.   Hansmann, "Principles of Mobile Computing", Wiley India Ltd, 2004.

CS1451 – NETWORK PROTOCOLS

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UNIT I   FRAME RELAY AND ISDN   **9**

Frame relay protocol architecture − Call control − Data transfer − Overview of ISDN − Channels − User access − Protocols.

UNIT II   ATM AND BISDN   **9**

ATM protocol architecture − Transmission of ATM cells − ATM adaptation layer − Congestion control − Broadband ISDN.

UNIT III   SECURITY PROTOCOLS   **9**

Private key encryption − Data encryption system, public key encryption − RSA − Elliptic curve − Cryptography − Authentication − Web security − Current protocols.

UNIT IV   NETWORK MANAGEMENT FUNDAMENTALS   **9**

Network management requirements − Network monitoring − Network control − SNMP − Concepts, MIBs − Implementation issues.

UNIT V   NETWORK MANAGEMENT PROTOCOLS   **9**

SNMP V2 system architecture − Protocols − SNMP V3 − RMON − CMIP.

Total: 45

TEXT BOOKS
1.   William Stallings, "Data and Computer Communications", 5th Edition, PHI, 1997.
2.   William Stallings, "SNMP, SNMPV2, SNMPV3 and RMON1 and 2", 3rd Edition, Addison Wesley, 1999.

REFERENCES
1.   Mani Subramanian, "Network Management−Principles and Practices", Addison Wesley, 2000.
2.   William Stallings, "Cryptography and Network Security", PHI, 2000.

LIST OF ELECTIVES

ELECTIVE I

CS1001 – PARALLEL COMPUTING
(Common to CSE and IT)

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UNIT I   SCALABILITY AND CLUSTERING   9

Evolution of computer architecture − Dimensions of scalability − Parallel computer models − Basic concepts of clustering − Scalable design principles − Parallel programming overview − Processes − Tasks and threads − Parallelism issues − Interaction / communication Issues − Semantic issues in parallel programs.

UNIT II   ENABLING TECHNOLOGIES   9

System development trends − Principles of processor design − Microprocessor architecture families − Hierarchical memory technology − Cache coherence protocols − Shared memory consistency − Distributed cache memory architecture − Latency tolerance techniques − Multithreaded latency hiding.

UNIT III   SYSTEM INTERCONNECTS   9

Basics of interconnection networks − Network topologies and properties − Buses − Crossbar and multistage switches − Software multithreading − Synchronization mechanisms.

UNIT IV   PARALLEL PROGRAMMING   9

Paradigms and programmability − Parallel programming models − Shared memory programming.

UNIT V   MESSAGE PASSING PROGRAMMING   9

Message passing paradigm − Message passing interface − Parallel virtual machine.

Total: 45

TEXT BOOKS
1.   Kai Hwang and Zhi.Wei Xu, "Scalable Parallel Computing", Tata McGraw-Hill, 2003.
2.   David E. Culler and Jaswinder Pal Singh, "Parallel Computing Architecture: A Hardware/Software Approach", Morgan Kaufman Publishers, 1999.

REFERENCES
1.   Michael J. Quinn, "Parallel Programming in C with MPI and OpenMP", Tata McGraw-Hill, 2003.
2.   Kai Hwang, "Advanced Computer Architecture", Tata McGraw-Hill, 2003.

CS1002 – DIGITAL IMAGE PROCESSING
(Common to CSE, ECE and IT)

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UNIT I   IMAGE FUNDAMENTALS AND TRANSFORMS   9

Elements of visual perception − Image sampling and quantization basic relationship between pixels − Basic geometric transformations − Introduction to fourier transform and DFT − Properties of 2D fourier transform − FFT − Separable image transforms − Walsh-Hadamard − Discrete cosine transform − Haar-Slant − Karhunen-Loeve Transforms.

UNIT II   IMAGE ENHANCEMENT TECHNIQUES   9

Spatial domain methods − Basic grey level transformation − Histogram equalization − Image subtraction − Image averaging − Spatial filtering − Smoothing − Sharpening filters − Laplacian filters − Frequency domain filters − Smoothing − Sharpening Filters − Homomorphic Filtering.

UNIT III   IMAGE RESTORATION   9

Model of image degradation/restoration process − Noise models − Inverse filtering − Least mean square filtering − Constrained least mean square filtering − Blind image restoration − Pseudo inverse − Singular value decomposition.

UNIT IV   IMAGE COMPRESSION   9

Lossless compression − Variable length coding − LZW coding − Bit plane coding − Predictive coding − PCM − Lossy compression − Transform coding − Wavelet coding − Basics of image compression standards − JPEG − MPEG − Basics of vector quantization.

UNIT V   IMAGE SEGMENTATION AND REPRESENTATION   9

Edge detection − Thresholding − Region based segmentation − Boundary representation − Chair codes − Polygonal approximation − Boundary segments − Boundary sescriptors − Simple descriptors − Fourier descriptors − Regional descriptors − Simple descriptors − Texture.

Total: 45

TEXT BOOKS
1.   Rafael C. Gonzalez and Richard E. Woods, "Digital Image Processing", 2nd Edition, Pearson Education, 2003.
2.   Jain, A. K.,   "Fundamentals of Digital Image Processing", PHI, 1995.

REFERENCES
1.   William K. Pratt, "Digital Image Processing", John Willey,2001.
2.   Chanda Dutta Magundar, "Digital Image Processing and Applications", PHI, 2000.

CS1003 – COMPONENT BASED TECHNOLOGY
(Common to CSE and IT)

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UNIT I   SOFTWARE COMPONENTS   9

Software Components − Objects − Fundamental Properties of component technology − Modules − Interfaces − Callbacks − Directory Services − Component architecture − Components and middleware.

UNIT II   JAVA BASED COMPONENT TECHNOLOGIES   9

Threads − Java Beans − Events and Connections − Properties − Introspection − JAR Files − Reflection − Object Serialization − Enterprise Java Beans − Distributed Object Models − RMI and RMI − IIOP.

UNIT III   CORBA COMPONENT TECHNOLOGIES   9

Java and CORBA − Interface definition language − Object request broker − System object model − Portable object adapter − CORBA services − CORBA component model − Containers − Application Server − Model driven architecture.

UNIT IV   . NET BASED COMPONENT TECHNOLOGIES   9

COM − Distributed COM − Object reuse − Interfaces and versioning − Dispatch interfaces − Connectable objects − OLE containers and servers − Active X controls − .NET components − Assemblies − Appdomains − Contexts − Reflection − Remoting.

UNIT V   COMPONENT FRAMEWORKS AND DEVELOPMENT   9

Connectors − Contexts − EJB containers − CLR contexts and channels − Black box component Framework − Directory objects − Cross-development environment − Component-oriented programming − Component design and implementation tools − Testing tools − Assembly tools.

Total: 45

TEXT BOOKS
1. Clemens Szyperski, "Component Software: Beyond Object-Oriented Programming", Pearson Education Publishers, 2003.
2. Ed Roman, "Mastering Enterprise Java Beans", John Wiley and Sons Inc., 1999.

REFERENCES
1. Mowbray, "Inside CORBA", Pearson Education, 2003.
2. Freeze, "Visual Basic Development Guide for COM and COM+", BPB Publication, 2001.
3. Hortsamann and Cornell, "Core Java Vol-II" Sun Press, 2002.
4. Sudha Sadasivam, "Component Based Technology", John Wiley and Sons, 2008.

CS1004 – NATURAL LANGUAGE PROCESSING

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UNIT I   FUNDAMENTALS   6

Basics − 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 − Noun phrase − Coordination − Agreement − Verb phase 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 − Basic top-down parser − Problems with the basic top-down parser − 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 − Word net − Database of lexical relations − 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 − Transfer metaphor − Interlingua idea: using meaning − Direct translation − Using statistical techniques − Usability and system development.

Total: 45

TEXT BOOK

1.   Daniel Jurafsky and James H. Martin, "Speech and Language Processing", Pearson Education Pvt. Ltd., 2002.

REFERENCES

1.   James Allen, "Natural Language Understanding", Pearson Education, 2003.
2.   Akshar Bharathi, Chaitanya and Sangal, "Natural Language Processing : A Paninian Approach", PHI, 2004.

CS1005 – UNIX INTERNALS
(Common to CSE and IT)

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UNIT I   GENERAL OVERVIEW OF THE SYSTEM   9

History − System structure − User perspective − Operating system services − Assumptions about hardware − Introduction to the kernel − Architecture of the UNIX operating system − Introduction to system concepts − Kernel data structures − System administration − Summary and preview.

UNIT II   BUFFER CACHE   9

Buffer headers − Structure of the buffer pool − Advantages and disadvantages of the buffer cache − Internal representation of files − Inodes − Structure of a regular file − Directories − Conversion of a path name to an inode − Super block − Other file types.

UNIT III   SYSTEM CALLS FOR FILE SYSTEM   9

Open − Read − Write − File and record locking − Adjusting the position of file I/O − LSEEK − Close − File creation − Creation of special files − Pipes − Dup − Mounting and unmounting file systems.

UNIT IV   THE STRUCTURE OF PROCESSES   9

Process states and transitions − Layout of system memory − The context of a process − Saving the context of a process − Process control − Process creation − Signals − Process termination − Awaiting process termination − Invoking other programs − The shell − System boot and the INIT process.

UNIT V   PROCESS SCHEDULING AND MEMORY MANAGEMENT POLICIES   9

Process scheduling − Memory management policies − Swapping − A hybrid system with swapping and demand paging − The I/O subsystem − Driver interfaces − Disk drivers − Terminal drivers.

Total: 45

TEXT BOOK
1.   Maurice J. Bach, "The Design of the Unix Operating System", PHI, 2004.

REFERENCE
1.   Vahalia, "Unix Internals: The New Frontiers", Pearson Education Inc, 2003.

CS1006 − OPEN SOURCE SOFTWARE
(Common to CSE and IT)

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UNIT I   LINUX FUNDAMENTALS I   9

Overview of free/open source software − Definition of FOSS and GNU − History of GNU/Linux and the free software movement − Advantages of free software and GNU/Linux − FOSS usage − Trends and potential − Global and Indian − GNU/Linux OS installation − Detect hardware − Configure disk partitions and file systems − Install A GNU/Linux distribution − Basic shell commands − Logging in − Listing files − Editing files − Copying/moving files − Viewing file contents − Changing file modes and permissions − Process management − User and group management − File ownerships and permissions − PAM authentication − Introduction to common system configuration files and log files − Configuring Networking − Basics of TCP/IP networking and routing − Connecting to the internet. (Through dialup −DSL- Ethernet −Leased line)

UNIT II   LINUX FUNDAMENTALS II   9

Configuring additional hardware − Sound cards − Displays and display cards − Network cards – Modems − USB drives − CD writers − Understanding the OS Boot- up process − Performing every day tasks using Gnu/Linux − Accessing the internet- playing music − Editing documents and spreadsheets − Sending and receiving email − Copy files from disks and over the network − Playing games − Writing CDS − X window system configuration and utilities − Configure X windows − Detect display devices − Installing software − From source code as well as using binary packages − Setting up email servers − Using postfix (SMTP Services) − Courier (IMAP and POP3 Services) − Squirrel mail (Web Mail Services) − Setting up web servers − Using apache (HTTP Services) − PHP (Server-side Scripting) − Perl (CGI Support) − Setting up file services − Using samba (File and authentication Services for windows networks) − Using NFS (File services for Gnu/Linux / Unix networks) − Setting up proxy services − Using squid (Http / Ftp / Https proxy services) − Setting up printer services − Using CUPS (Print Spooler) − Foomatic.(Printer Database)

UNIT III   DEVELOPMENT ENVIRONMENT   9

Setting up a firewall − Using netfilter and IP tables − Using the GNU compiler collection − GNU compiler tools − C preprocessor (CPP) − C compiler (GCC) and the C++ compiler (G++) − Assembler (GAS) − Understanding build systems − Constructing make files and using make − Using autoconf and autogen to automatically generate make files tailored for different development environments − Using source code versioning and management tools − Using CVS to manage source code revisions − Patch and diff.

UNIT IV   LINUX INTERNALS   9

Understanding the GNU LIBC libraries and linker − Linking against object archives (.A Libraries) and dynamic shared object libraries (.So Libraries) − Generating statically linked binaries and libraries − Generating dynamically linked libraries − Using the GNU debugging tools − GDB to debug programs − Graphical debuggers like DDD − Memory debugging / profiling libraries MPATROL and VALGRIND − Review of common programming practices and guidelines for GNU/Linux and FOSS − Basics of bash − SED and AWK scripting − Basics of the X windows server architecture.

UNIT V   DESKTOP PROGRAMMING   9

QT programming − GTK+ programming − Python programming − Programming GUI applications with localization support.

Total: 45

TEXT BOOK

1. Venkateshwarlu, N. B., "Introduction to Linux: Installation and Programming", B S Publishers, 2005.

REFERENCES

1. Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson and Lar Kaufman, "Running Linux", 4th Edition, O'Reilly Publishers, 2002.
2. Carla Schroder, "Linux Cookbook", 1st Edition, O'Reilly Cookbooks Series, November 2004.

ON-LINE MATERIALS

1. "Open Sources: Voices from the Open Source Revolution", 1st Edition, January 1999.
   URL: http://www.oreilly.com/catalog/opensources/book/toc.html
2. "The Linux Cookbook: Tips and Techniques for Everyday Use", 1st Edition, Michael Stutz, 2001. URL: http://dsl.org/cookbook/cookbook_toc.html
3. "The Linux System Administrators' Guide", Lars Wirzenius, Joanna Oja, Stephen Stafford, and Alex Weeks, December 2003.
   URL: http://www.tldp.org/guides.html
4. Using GCC, Richard Stallman et al. URL: http://www.gnu.org/doc/using.html
5. An Introduction to GCC, Brian Gough. URL: http://www.network-theory.co.uk/docs/gccintro/
6. GNU Autoconf, Automake and Libtool, Gary V. Vaughan, Ben Elliston, Tom Tromey and Ian Lance Taylor. URL: http://sources.redhat.com/autobook/
7. Open Source Development with CVS, 3rd Edition, Karl Fogel and Moshe Bar. URL:http://cvsbook.red-bean.com/
8. Advanced Bash Scripting Guide, Mendel Cooper, June 2005.
   URL: http://www.tldp.org/guides.html
9. GTK+/GNOME Application Development, Havoc Pennington.
   URL: http://developer.gnome.org/doc/GGAD/
10. Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor.
    URL: http://www.python.org/doc/current/tut/tut.html

CS1007 – WIRELESS NETWORK SYSTEMS
(Common to CSE and IT)

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UNIT I   FUNDAMENTALS   9

Overview of wireless systems – Teletraffic engineering – Radio propagation and propagation path-loss models – Overview of digital communication and transmission.

UNIT II   WIRELESS WIDE AREA NETWORK (WWAN)   9

Multiple access techniques – Architecture of a wireless wide area network.

UNIT III   SPEECH AND MODULATION SCHEMES   9

Speech coding and channel coding – Modulation schemes.

UNIT IV   MOBILITY AND SECURITY MANAGEMENT   9

Mobility management in wireless networks – Security in wireless systems.

UNIT V   GSM AND CDMA 2000   9

Wide Area Wireless Networks (WANs) – GSM evolution – Wide area wireless networks – CDMA one evolution.

Total: 45

TEXT BOOKS
1.   Garg, V.K., "Wireless Communications and Networking", Elsevier, 2008.
2.   Rappaport, T. S.,   "Wireless Communications, Principles and Practice", Prentice Hall, 1996.

REFERENCES
1.   Stallings, W., "Wireless Communications and Networks", Prentice Hall, 2001.
2.   Schiller, J., "Mobile Communications", Addison Wesley, 2000.
3.   Lee, W.C.Y., "Mobile Communications Engineering: Theory and Applications", 2nd Edition, McGraw Hill, 1997.
4.   Pahlavan, K. and Krishnamurthy, P., "Principles of Wireless Networks", Prentice Hall, 2002.
5.   Black, U.D., "Mobile and Wireless Networks", Prentice Hall, 1996.

ELECTIVE II

EC1021 – HIGH PERFORMANCE MICROPROCESSORS
(Common to CSE and IT)

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UNIT I   CISC PRINCIPLES   9

Classic CISC microprocessors − Intel X86 families − Architecture − Register set − Data formats − Addressing modes − Instruction set − Assembler directives − Interrupts − Segmentation − Paging − Real and virtual mode execution − Protection mechanism − Task management 8086- 286- 386 and 486 architectures.

UNIT II   PENTIUM PROCESSORS   10

Introduction to pentium microprocessor − Special pentium registers − Pentium memory management − New pentium instructions − Introduction to pentium pro and its special features − Architecture of pentium II − Pentium III and pentium4 microprocessors.

UNIT III   RISC PRINCIPLES   10

RISC Vs CISC − RISC properties and evaluation − On chip register file Vs cache evaluation − Study of a typical RISC processor − The powerPC − Architecture and special features − Power PC 601 − IBM RS/6000 − Sun SPARC family − Architecture − Super SPARC.

UNIT IV   RISC PROCESSOR   8

MIPS Rx000 family − Architecture − Special features − MIPS R4000 and R4400 − Motorola 88000 Family − Architecture − MC 88110 − MC 88100 and MC 88200.

UNIT V   SPECIAL PURPOSE PROCESSORS   8

EPIC architecture − ASIPs − Network processors − DSPs − Graphics/image processors.

Total: 45

TEXT BOOKS

1. Daniel Tabak, "Advanced Microprocessors", 2nd Edition, TMH, 1995.
2. Brey, B.B., "The Intel Microprocessors −8086/8088- 80186/80188, 80286, 80386, 80486, Pentium −Pentium Pro Processor, Pentium II, Pentium III, Pentium IV, Architecture, Programming and Interfacing", 6th Edition, Pearson Education/PHI, 2002.

REFERENCES

1. www.intel.com/products/server/processors/server/itanium2 (Unit V:EPIC)
3. www.hpl.hp.com/techreports/1999/HPL-1999-111.html(UnitV:Network Processor)
4. www.intel.com/design/network/products/npfamily (UnitV:Network Processor)
5. www.national.com/appinfo/imaging/processors.html(UnitV: Image Processor)

CS1008 – ADVANCED JAVA PROGRAMMING

(Common to CSE and IT)

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UNIT I   JAVA FUNDAMENTALS   9

Java I/O streaming − Filter and pipe streams − Byte code interpretation − Reflection − Dynamic Reflexive classes − Threading − Java native interfaces − Swing.

UNIT II   NETWORK PROGRAMMING IN JAVA   9

Sockets − Secure sockets − Custom sockets − UDP datagram's − Multicast sockets − URL classes − Reading data from the server − Writing data − Configuring the connection − Reading the header − Telnet application − Java messaging services.

UNIT III   APPLICATIONS IN DISTRIBUTED ENVIRONMENT   9

Remote method invocation − Activation models − RMI custom sockets − Object serialization − RMI − IIOP implementation − CORBA − IDL technology − Naming services − CORBA programming models − JAR File creation.

UNIT IV   MULTI-TIER APPLICATION DEVELOPMENT   9

Server side programming − Servlets − Java server pages − Applet to applet communication − Applet to servlets communication − JDBC − Using BLOB and CLOB objects − Storing multimedia data into databases − Multimedia streaming applications − Java media framework.

UNIT V   ENTERPRISE APPLICATIONS   9

Server side component architecture − Introduction to J2EE − Session beans − Entity beans − Persistent entity beans − Transactions.

Total: 45

TEXT BOOKS
1.   Elliotte Rusty Harold , " Java Network Programming" , O'Reilly Publishers, 2000.
2.   Ed Roman, "Mastering Enterprise Java Beans", John Wiley and Sons Inc., 1999.

REFERENCES
1.   Hortsmann and Cornell , "Core Java 2 Advanced Features, VOL II", Pearson Education , 2002.
2.   Web Reference: http://java.sun.com.
3.   Patrick Naughton, "Complete Reference − Java2", TMH 2003.

CS1009 – ADVANCED DATABASES
(Common to CSE and IT)

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UNIT I DISTRIBUTED DATABASES 9

Distributed DBMS concepts and design − Introduction − Functions and architecture of DDBMS − Distributed relational database design − Transparency in DDBMS − Distributed transaction management − Concurrency control − Deadlock management − Database recovery − The X/Open distributed transaction processing model − Replication servers − Distributed query optimization − Distribution and replication in oracle.

UNIT II OBJECT ORIENTED DATABASES 9

Object oriented databases − Introduction − Weakness of RDBMS − Object oriented concepts storing objects in relational databases − Next generation database systems − Object oriented data models − OODBMS perspectives − Persistence − Issues in OODBMS − Object oriented database management System manifesto − Advantages and disadvantages of OODBMS − Object oriented database design − OODBMS standards and systems − Object management group − Object database standard ODMG − Object relational DBMS − Postgres − Comparison of ORDBMS and OODBMS.

UNIT III WEB DATABASES 9

Web technology and DBMS − Introduction − The web − The web as a database application platform − Scripting languages − Common gateway interface − HTTP cookies − Extending the web server − Java − Microsoft's web solution platform − Oracle internet platform − Semi structured data and XML − XML related technologies − XML query languages.

UNIT IV INTELLIGENT DATABASES 9

Enhanced data models for advanced applications − Active database concepts and triggers − Temporal database concepts − Deductive databases − Knowledge databases.

UNIT V CURRENT TRENDS 9

Mobile database − Geographic information systems − Genome data management − Multimedia database − Parallel database − Spatial databases − Database administration − Data warehousing and data mining.

Total: 45

TEXT BOOKS

1. Connolly, T.M., and Begg, C.E., "Database Systems −A Practical Approach to Design, Implementation and Management", 3rd Edition, Pearson Education, 2003.
2. Ramez Elmasri and Navathe, S.B., "Fundamentals of Database Systems", 4th Edition, Pearson Education, 2004.

REFERENCES

1. Tamer Ozsu, M. and Patrick Ualduriel, "Principles of Distributed Database Systems", 2nd Edition, Pearson Education, 2003.
2. Prabhu, C.S.R., "Object Oriented Database Systems", PHI, 2003.
3. Peter Rob and Corlos Coronel, "Database Systems Design   Implementation and Management", 5th Edition, Thompson Learning Course Technology, 2003.

CS1010 – ADVANCED OPERATING SYSTEMS

(Common to CSE and IT)

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UNIT I   DISTRIBUTED SYSTEM STRUCTURES   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 − Basics − Classification of mutual exclusion and associated algorithms − Comparative performance analysis.

UNIT II   DISTRIBUTED DEADLOCKS   9

Distributed deadlock detection − Basics − 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 to the system model − A classification of agreement problems − Solutions to the byzantine agreement problem − Applications of agreement algorithms − Distributed resource management − Architecture − Mechanism for building distributed file systems − Design issues − Log structured file systems.

UNIT III   DISTRIBUTED COORDINATION   9

Distributed shared memory − Architecture − Algorithms for implementing DSM − Memory coherence and protocols − Design issues − Distributed scheduling − 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   PROTECTION AND SECURITY   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 encryptions − Authentication in distributed systems.

UNIT V MULTIPROCESSOR AND DISTRIBUTED DATABASE 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 BOOKS
1. Mukesh Singhal and Niranjan G.Shivaratri, "Advanced Concepts In Operating Systems: Distributed Database and Multiprocessor Operating Systems" , TMH, 2001.
2. Andrew S. Tanenbaum , "Modern Operating System", PHI, 2003.

REFERENCES
1. Pradeep K. Sinha, "Distributed Operating System-Concepts and Design", PHI,   2003.
2. Andrew S. Tanenbaum, "Distributed Operating System" , Pearson Education, 2003.

EC1401 – EMBEDDED SYSTEMS

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UNIT I   EMBEDDED SYSTEMS BASICS   9

Definition and classification − Overview of processors and hardware units in an embedded system − Software embedded into the system − Exemplary embedded systems − Embedded Systems on a Chip (SOC) − Use of VLSI designed circuits.

UNIT II   DEVICES AND BUSES FOR DEVICES NETWORK   9

I/O devices − Device I/O types and examples − Synchronous − Iso-synchronous and asynchronous communications from serial devices − Examples of internal serial-communication devices − UART and HDLC − Parallel port devices − Sophisticated interfacing features in devices/ports − Timer and counting devices − 12C- USB − CAN and advanced I/O serial high speed buses − ISA − PCI − PCIX − CPCI and advanced buses.

UNIT III   PROGRAMMING CONCEPTS AND EMBEDDED
                 PROGRAMMING IN C and C++   9

Programming in Assembly Language (ALP) Vs High Level Language − C program elements − Macros and functions − Use of pointers − NULL pointers − Use of function calls − Multiple function calls in a cyclic order in the main function pointers − Function queues and interrupt service routines − Queues − Pointers − Concepts of embedded programming in C++ − Objected oriented programming − Embedded programming in C++ − C program compilers − Cross compiler − Optimization of memory codes.

UNIT IV   REAL TIME OPERATING SYSTEMS −PART I   9

Definitions of process − Tasks and threads − Clear cut distinction between functions − ISRS and tasks by their characteristics − Operating system services − Goals – Structures − Kernel − Process management − Memory management − Device management − File system organization and implementation − I/O subsystems − Interrupt routines handling in RTOS − Real time operating systems − RTOS task scheduling models − Handling of task scheduling and latency and deadlines as performance metrics − Co-operative round robin scheduling − Cyclic scheduling with time slicing (Rate monotonic co-operative scheduling) − Preemptive scheduling model strategy by a scheduler − Critical section service by a preemptive scheduler − Fixed (static) real time scheduling of tasks − Inter process communication and synchronisation − Shared data problem − Use of Semaphore(S) − Priority inversion problem and deadlock situations − Inter process communications using signals − Semaphore flag or mutex as resource key − Message queues − Mailboxes − Pipes − Virtual (logical) sockets − Remote Procedure Calls (RPCS).

UNIT V   REAL TIME OPERATING SYSTEMS −PART II   9

Study of micro C/OSII or Vx works or any other popular RTOS − RTOS system level functions − Task service functions − Time delay functions − Memory allocation related functions − Semaphore related functions − Mailbox related functions − Queue related functions − Case studies of programming with RTOS − Understanding case definition − Multiple tasks and their functions − Creating a list of tasks − Functions and IPCs − Exemplary coding steps.

Total: 45

TEXT BOOKS

1. Wayne Wolf, "Computers as Components − Principles of Embedded Computing System Design", Harcourt India, Morgan Kaufman Publishers, 2001.
2. Rajkamal, "Embedded Systems Architecture - Programming and Design", TMH 1st reprint, Oct 2003.

REFERENCES

1. Steve Heath, "Embedded Systems Design", 2nd Edition, 2003.
2. David E. Simon, "An Embedded Software Primer", 1st Indian Reprint, Pearson Education Asia, 2000.
3. Frank Vahid and Tony Givargis, "Embedded Systems Design − A Unified Hardware / Software Introduction", John Wiley, 2002.

CS1011 – DATA WAREHOUSING AND DATA MINING

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UNIT I   BASICS OF DATA WAREHOUSING   8

Introduction − Data warehouse − Multidimensional data model − Data warehouse architecture − Implementation − Further development − Data warehousing to data mining.

UNIT II   DATA PREPROCESSING, LANGUAGE, ARCHITECTURES, CONCEPT DESCRIPTION   8

Why preprocessing − Cleaning − Integration − Transformation − Reduction − Discretization − Concept hierarchy generation − Data mining primitives − Query language − Graphical user interfaces − Architectures − Concept description − Data generalization − Characterizations − Class comparisons − Descriptive statistical measures.

UNIT III   ASSOCIATION RULES   9

Association rule mining − Single-dimensional boolean association rules from transactional databases − Multi level association rules from transaction databases

UNIT IV   CLASSIFICATION AND CLUSTERING   12

Classification and prediction − Issues − Decision tree induction − Bayesian classification − Association rule based − Other classification methods − Prediction − Classifier accuracy − Cluster analysis − Types of data − Categorization of methods − Partitioning methods − Outlier analysis.

UNIT V   RECENT TRENDS   8

Multidimensional analysis and descriptive mining of complex data objects − Spatial databases − Multimedia databases − Time series and sequence data − Text databases − World Wide Web − Applications and trends in data mining.

Total: 45

TEXT BOOKS

1. Han, J. and Kamber, M., "Data Mining: Concepts and Techniques", Harcourt India / Morgan Kauffman, 2001.
2. Margaret H. Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education 2004.

REFERENCES

1. Sam Anahory and Dennis Murry, "Data Warehousing in the real world", Pearson Education, 2003.
2. David Hand, Heikki Manila and Padhraic Symth, "Principles of Data Mining", PHI 2004.
3. W.H.Inmon, "Building the Data Warehouse", 3rd Edition, Wiley, 2003.
4. Alex Bezon and Stephen J.Smith, "Data Warehousing, Data Mining and OLAP", McGraw-Hill Edition, 2001.
5. Paulraj Ponniah, "Data Warehousing Fundamentals", Wiley-Interscience Publication, 2003.

CS1012 – KNOWLEDGE BASED DECISION SUPPORT SYSTEMS
(Common to CSE and IT)

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UNIT I   BASIC CONCEPTS   9

Decision making systems − Modeling and support − Basics and definition − Systems models − Modeling process − Decision making − Intelligence phase − Design phase − Choice phase − Evaluation − Implementation phase − Alternative decision making models − Decision support systems − Decision makers − Case applications.

UNIT II   DECISION SUPPORT SYSTEM DEVELOPMENT   9

Decision support system development − Basics − Life cycle − Methodologies − Prototype − Technology levels and tools − Development platforms − Tool selection − Developing DSS − Enterprise systems − Concepts and definition − Evolution of information systems − Information needs − Characteristics and capabilities − Comparing and integrating EIS and DSS − EIS data access − Data warehouse − OLAP − Multidimensional analysis − Presentation and the web − Including soft information enterprise on systems − Organizational DSS − Supply and value chains − Decision support − Supply chain problems and solutions − Computerized systems MRP − ERP − SCM − Frontline decision support systems.

UNIT III   KNOWLEDGE MANAGEMENT   9

Introduction − Organizational learning and memory − Knowledge management − Development − Methods − Technologies and tools − Success − Knowledge management and artificial intelligence − Electronic document management − Knowledge acquisition and validation − Knowledge engineering − Scope − Acquisition methods − Interviews − Tracking methods − Observation and other methods − Grid analysis − Machine learning − Rule induction − Case-based reasoning − Neural computing − Intelligent agents − Selection of an appropriate knowledge acquisition methods − Multiple experts − Validation and verification of the knowledge base − Analysis − Coding − Documenting- and Diagramming − Numeric and documented knowledge acquisition − Knowledge acquisition and the internet/intranets − Knowledge representation basics − Representation in logic and other schemas − Semantic networks − Production rules − Frames − Multiple knowledge representation − Experimental knowledge representations − Representing uncertainty.

UNIT IV   INTELLIGENT SYSTEM DEVELOPMENT   9

Inference techniques − Reasoning in artificial intelligence − Inference with rules − Inference tree − Inference with frames − Model based and case based reasoning − Explanation and meta knowledge − Inference with uncertainty − Representing uncertainty − Probabilities and related approaches − Theory of certainty − Approximate reasoning using fuzzy logic − Intelligent systems development − Prototyping − Project initialization − System analysis and design − Software classification − Building expert systems with tools − Shells and environments − Software selection − Hardware − Rapid prototyping and a demonstration prototype − System development − Implementation − Post implementation.

UNIT V   MANAGEMENT SUPPORT SYSTEMS   9

Implementing and integrating management support systems − Implementation − Major issues − Strategies − System integration − Generic models MSS − DSS − ES − Integrating EIS − DSS and ES − Global integration − Intelligent DSS − Intelligent modeling and model management − Examples of integrated systems − Problems and issues in integration − Impacts of management support systems − Overview − Organizational structure and related areas − MSS support to business process re-engineering − Personnel management issues − Impact on individuals − Productivity − Quality and competitiveness − Decision making and the manager manager's job − Issues of legality − Privacy and ethics − Intelligent systems and employment levels − Internet communication − Other societal impacts − Managerial implications and social responsibilities.

Total: 45

TEXT BOOKS

1.   Efrain Turban and Jay E. Aronson, "Decision Support Systems and Intelligent Systems", 6th Edition, Pearson Education, 2001.

2.   Ganesh Natarajan and Sandhya Shekhar, "Knowledge Management– Enabling Business Growth", Tata McGraw Hill, 2002.

REFERENCES

1.   George M. Marakas, "Decision Support System", Prentice Hall India, 2003.

2.   Efrem A. Mallach, "Decision Support and Data Warehouse Systems", Tata McGraw-Hill, 2002.

3.   Dalkar, "Knowledge Management – Theory and Pratice", Elsevir, 2007.

4.   Beccrra Fernandez and Laidener, "Knowledge Management – An Evolutionary View", PHI, 2009.

ELECTIVE III

CS1013 − C# AND . NET

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UNIT I   BASICS OF C#   8

Introducing C# − Understanding .NET − Overview of C# − Literals − Variables − Data types −
Operators − Expressions − Branching − Looping − Methods − Arrays − Strings − Structures −
Enumerations.

UNIT II   OBJECT ORIENTED ASPECTS OF C#   9

Classes − Objects − Inheritance − Polymorphism − Interfaces − Operator Overloading − Delegates −
Events − Errors and exceptions.

UNIT III   APPLICATION DEVELOPMENT ON .NET   8

Building windows applications − Accessing data with ADO.NET.

UNIT IV   WEB BASED APPLICATION DEVELOPMENT ON .NET   8

Programming web applications with web forms − Programming web services.

UNIT V   THE CLR AND THE .NET FRAMEWORK   12

Assemblies − Versioning − Attributes − Reflection − Viewing metadata − Type discovery − Reflecting
on a type − Marshalling − Remoting − Understanding server object types − Specifying a server with an
interface − Building a server − Building the client − Using single call − Threads.

                                                                        Total: 45

TEXT BOOKS
1.   Balagurusamy, E., "Programming in C#", TMH, 2004.
2.   Liberty, J., "Programming C#", 2nd Edition, O'Reilly, 2002.

REFERENCES
1.   Herbert Schildt, "The Complete Reference −C#", TMH, 2004.
2.   Robinson, "Professional C#", 2nd Edition, Wrox Press, 2002.
3.   Andrew Troelsen, "C# and the .NET Platform", A! Press, 2003.
4.   Thamarai Selvi, S. and Murugesan, R., "A Textbook on C#", Pearson Education, 2003.

IT1451 – XML AND WEB SERVICES
(Common to CSE and IT)

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UNIT I   XML TECHNOLOGY FAMILY   9

XML – Benefits – Advantages of XML over HTML – EDI – Databases – XML Based standards – Structuring with schemas – DTD – XML schemas – XML processing – DOM – SAX – Presentation technologies – XSL – XFORMS – XHTML – Transformation – XSLT – XLINK – XPATH – Xquery

UNIT II   ARCHITECTING WEB SERVICES   9

Business motivations for web services – B2B – B2C – Technical motivations – Limitations of CORBA and DCOM – Service Oriented Architecture (SOA) – Architecting web services – Implementation view – Web services technology stack – Logical view – Composition of web services – Deployment view – From application server to peer to peer – Process view – Life in the runtime.

UNIT III   WEB SERVICES BUILDING BLOCKS   9

Transport protocols for web services – Messaging with web services – Protocols – SOAP – Describing web services – WSDL – Anatomy of WSDL – Manipulating WSDL – Web service policy – Discovering web services – UDDI – Anatomy of UDDI – Web service inspection – Ad hoc discovery – Securing web services.

UNIT IV   IMPLEMENTING XML IN E–BUSINESS   9

B2B – B2C applications – Different types of B2B interaction – Components of E -Business XML systems – EBXML – RosettaNet – Applied XML in vertical industry – Web services for mobile devices.

UNIT V   XML CONTENT MANAGEMENT AND SECURITY   9

Semantic web – Role of meta data in web content – Resource description framework – RDF schema – Architecture of semantic web – Content management workflow – XLANG – WSFL – Securing web services.

Total: 45

TEXT BOOKS

1. Ron Schmelzer and Travis Vandersypen, "XML and Web Services unleashed", Pearson Education, 2002.
2. Keith Ballinger, ".NET Web Services Architecture and Implementation", Pearson Education, 2003.

REFERENCES

1. David Chappell, "Understanding .NET A Tutorial and Analysis", Addison Wesley, 2002.
2. Kennard Scibner and Mark C. Stiver, "Understanding SOAP", SAMS Publishing, 2000.
3. Alexander Nakhimovsky and Tom Myers, "XML Programming: Web Applications and Web Services with JSP and ASP", Apress, 2002.

CS1014 – USER INTERFACE DESIGN
(Common to CSE and IT)

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UNIT I   USER INTERFACE BASICS   8
Introduction − Importance − Human − Computer interface − Characteristics of graphics interface − Direct manipulation graphical system − Web user interface − Popularity − Characteristic and principles.

UNIT II   INTERFACE DESIGN   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   INTERFACE CHARACTERISTICS   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   WEB PRESENTATION   9
Text for web pages − Effective feedback guidance and assistance − Internationalization − Accessibility − Icons − Image − Multimedia − Coloring.

UNIT V   LAYOUT TESTING   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 and 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.

CS1015 – INFORMATION SECURITY

(Common to CSE and IT)

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UNIT 1   FUNDAMENTALS   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 − SDLC − 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 mode l − 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 BOOKS
1.   Michael E. Whitman and Herbert J. Mattord, "Principles of Information Security", Vikas Publishing House, 2003.
2.   Straub, "Information Security : Policy, Processes and Practices", PHI, 2009.

REFERENCES
1.   Micki Krause and Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3, CRC Press LLC, 2004.
2.   Stuart Mc Clure, Joel Scrambray and George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003.
3.   Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.
4.   Patel, "Information Security : Theory and Practice", PHI, 2006.

CS1016 – SOFTWARE TESTING
(Common to CSE and IT)

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UNIT I   TESTING BASICS   8

Testing as an engineering activity – Role of process in software quality – Testing as a process – Basic definitions – Software testing principles – The tester's role in a software development organization – Origins of defects – Defect classes – The defect repository and test design – Defect examples – Developer / tester support for developing a defect repository.

UNIT II   TEST CASE DESIGN   11

Introduction to testing design strategies – The smarter tester – Test case design strategies – Using black box approach to test case design – Random testing – Equivalence class partitioning – Boundary value analysis – Other black box test design approaches – Black box testing and COTS – Using white box approach to test design – Test adequacy criteria – Coverage and control flow graphs – Covering code logic – Paths – Their role in white box based test design – Additional white box test design approaches – Evaluating test adequacy criteria.

UNIT III   LEVELS OF TESTING   9

The need for levels of testing – Unit test – Unit test planning – Designing the unit tests – The class as a testable unit – The test harness – Running the unit tests and recording results – Integration tests – Designing integration tests – Integration test planning – System test – The different types – Regression testing – Alpha, beta and acceptance tests.

UNIT IV   TEST MANAGEMENT   9

Introductory concepts – Testing and debugging goals and policies – Test planning – Test plan components – Test plan attachments – Locating test items – Reporting test results – The role of three groups in test planning and policy development – Process and the engineering disciplines – Introducing the test specialist – Skills needed by a test specialist – Building a testing group.

UNIT V   CONTROLLING AND MONITORING   8

Defining terms – Measurements and milestones for controlling and monitoring – Status meetings – Reports and control issues – Criteria for test completion – SCM – Types of reviews – Developing a review program – Components of review plans – Reporting review results.

Total: 45

TEXT BOOKS

1.   Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2003.
2.   Renu Rajani and Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw Hill, 2003.

REFERENCES

1.   Edward Kit, "Software Testing in the Real World – Improving the Process", Pearson Education, 1995.
2.   Elfriede Dustin, "Effective Software Testing", Pearson Education, 2003.

GE1351 – PROFESSIONAL ETHICS AND HUMAN VALUES
(Common to Biomedical, CSE and ECE)

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UNIT I   HUMAN VALUES   10
Morals − Values and ethics − Integrity − Work ethic − Service learning − Civic virtue − Respect for others − Living peacefully − Caring − Sharing − Honesty − Courage − Valuing Time − Co-operation − Commitment − Empathy − Self-Confidence − Character − Spirituality.

UNIT II   ENGINEERING ETHICS   9
Senses of engineering ethics − Variety of moral issued − Types of inquiry − Moral dilemmas − Moral autonomy − Kohlberg's theory − Gilligan's theory − Consensus and controversy − Models of professional roles − Theories about right action − Self-interest − Customs and religion − Uses of ethical theories.

UNIT III   ENGINEERING AS SOCIAL EXPERIMENTATION   9
Engineering as experimentation − Engineers as responsible experimenters − Codes of ethics − Balanced outlook on law − Challenger case study.

UNIT IV   SAFETY- RESPONSIBILITIES AND RIGHTS   9
Safety and risk − Assessment of safety and risk − Risk benefit analysis and reducing risk − Three mile island and chernobyl case studies − Collegiality and loyalty − Respect for authority − Collective bargaining − Confidentiality − Conflicts of interest − Occupational crime − Professional rights − Employee rights − Intellectual Property Rights (IPR) − Discrimination.

UNIT V   GLOBAL ISSUES   8
Multinational corporations − Environmental ethics − Computer ethics weapons development − Engineers as managers − Consulting engineers − Engineers as expert witnesses and advisors − Moral Leadership − Sample code of ethics like ASME- ASCE − IEEE- Institution of engineers (India) − Indian institute of materials management − Institution of Electronics and Telecommunication Engineers (IETE)-India- Etc.

Total: 45

TEXT BOOKS
1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, 1996.
2. Govindarajan M., Natarajan S. and Senthil Kumar V.S, "Engineering Ethics", Prentice Hall of India, 2004.

REFERENCES
1. Charles D. Fleddermann, "Engineering Ethics", Pearson Education/ Prentice Hall, 2004.
2. Charles E. Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics −Concepts and Cases", Wadsworth Thompson Learning, 2000.
3. John R. Boatright, "Ethics and the Conduct of Business", Pearson Education, 2003.
4. Edmund G. Seebauer and Robert L. Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, 2001.

CS1017 – TCP/IP DESIGN AND IMPLEMENTATION

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UNIT I   FUNDAMENTALS   9

Internetworking concepts and architectural model − Class full internet address – CIDR − Subnetting and super netting − 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 − Keep alive 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 and 2 ", 4th Edition, Pearson Education Asia, 2003
2. Richard Stevens, W., "TCP/IP illustrated", Vol. 1, Pearson Education, 2003.

REFERENCES

1. Forouzan, "TCP/IP Protocol Suite" , 2nd Edition, TMH, 2003.
2. Richard Stevens, W., "TCP/IP Illustrated", Vol. 2, Pearson Education, 2003.

ELECTIVE IV

CS1018 – GRID COMPUTING

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UNIT I   GRID COMPUTING   9
Introduction − Definition and scope of grid computing.

UNIT II   GRID COMPUTING INITIALIVES   9
Grid computing organizations and their roles − Grid computing analog − Grid computing road map.

UNIT III   GRID COMPUTING APPLICATIONS   9
Merging the grid sources − Architecture with the web devices architecture.

UNIT IV   TECHNOLOGIES   9
OGSA − Sample use cases − OGSA platform components − OGSI − OGSA basic services.

UNIT V   GRID COMPUTING TOOL KITS   9
Globus GT 3 toolkit − Architecture − Programming model − High level services − OGSI .Net middleware solutions.

Total: 45

TEXT BOOK
1.   Joshy Joseph and Craig Fellenstein, "Grid Computing", Pearson Education, 2003.

REFERENCE
1.   Ahmar Abbas, "Grid Computing − A Practical Guide to technology and Applications", Charles River Media, 2003.

CS1019 – FUNDAMENTALS OF PERVASIVE COMPUTING

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UNIT I   PERVASIVE ARCHITECTURE   9

Local area networks − Wireless LANS − Relationship of wireless − Internet and ubiquitous computing − Pervasive computing and ubiquitous computing − Ambient computing − Pervasive web application architecture − Requirements of computational infrastructure − Failure management − Security − Performance − Dependability.

UNIT II   MOBILE DEVICE TECHNOLOGIES   9

Mobile computing devices characteristics − Adaptation − Data dissemination and management − Heterogeneity − Interoperability − Context awareness − Language localization issues − User interface design issues − Difference between UI design for mobile devices and conventional systems − Mobile agents − Mobile device technology overview − Windows CE − Symbian − J2ME − Pocket PC − BREW.

UNIT III   SENSOR NETWORKS AND RFID'S   9

Introduction to sensor networks − Sensor node architecture − Sensor network architecture − Types of sensor networks − Platforms for wireless sensor networks − Applications of wireless sensor networks − Introduction to RFID − Transponder and reader architecture − Types of tags and readers − Frequencies of operation − Application of RFID technologies.

UNIT IV   LOCAL AREA AND WIDE AREA WIRELESS TECHNOLOGIES   9

IEEE 802.11 technologies − Infrared technologies − Bluetooth networks (OBEX Protocol) − Personal area networks − Mobility management − Mobile IP − Establishing wide area wireless networks − Concept and structure of cell − Call establishment and maintenance − Channel management − Frequency assignment techniques.

UNIT V   PROTOCOLS AND APPLICATIONS   9

Networking protocols − Packet switched protocols − Routing protocols for sensor networks − Data centric protocols − Hierarchical protocols − Location − Based protocols − Multimedia Messaging Service (MMS) protocols − Wireless Application Protocol (WAP) − Applications of pervasive computing − Retail − Healthcare − Sales force automation − Tracking applications.

Total: 45

TEXT BOOKS

1. Burkhardt Henn Hepper and Rintdorff Schaeck, "Pervasive Computing", Addison Wesley, 2002.
2. Adelstein, F. and Gupta, S.K.S., "Fundamentals of Mobile and Pervasive Computing", Tata McGraw Hill, 2005.

REFERENCE

1. Ashoke Talukdar and Roopa Yavagal, "Mobile Computing", Tata McGraw Hill, 2005

CS1020 – REAL TIME SYSTEMS

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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 − Pseudo code and programming design languages − Finite state automata − Data flow diagrams − Petri nets − Warnier or notation − State charts − Polled loop systems − Phase/state driven code − Co-routines − 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 BOOKS

1.   Philip A. Laplante, "Real Time System Design and Analysis − An Engineer's Handbook", 3rd Edition, Wiley-IEEE Press.
2.   Krishna, C.M. and Kang G. Shin, "Real Time Systems", TMH, 1997

REFERENCES

1.   Stuart Bennelt, "Real time computer control and Introduction", Pearson Education, 2003.
2.   Allen Burns and Andy Wellings, "Real Time Systems and Programming Languages", Pearson Education, 2003.

CS1021 – SOFT COMPUTING
(Common to Biomedical, CSE, ECE and IT)

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UNIT I   FUZZY SET THEORY   10

Introduction to neuro − Fuzzy and soft computing − Fuzzy sets − Basic definition and terminology − Set-theoretic operations − Member function formulation and parameterization − Fuzzy rules and fuzzy reasoning − Extension principle and fuzzy relations − Fuzzy if-then rules − Fuzzy reasoning − Fuzzy inference systems − Mamdani fuzzy models − Sugeno fuzzy models − Tsukamoto fuzzy models − Input space partitioning and fuzzy modeling.

UNIT II   OPTIMIZATION   8

Derivative − Based optimization − Descent methods − Method of steepest descent − Classical newton's method − Step size determination − Derivative-free optimization − Genetic algorithms − Simulated annealing − Random search − Downhill simplex search.

UNIT III   NEURAL NETWORKS   10

Supervised learning neural networks − Perceptrons − Adaline − Back propagation multilayer perceptrons − Radial basis function networks − Unsupervised learning neural networks − Competitive learning networks − Kohonen self-organizing networks − Learning vector quantization − Hebbian learning.

UNIT IV   NEURO FUZZY MODELING   9

Adaptive neuro − Fuzzy inference systems − Architecture − Hybrid learning algorithm − Learning methods that cross-fertilize ANFIS and RBFN − Coactive neuro fuzzy modeling − Framework neuron functions for adaptive networks − Neuro fuzzy spectrum.

UNIT V   APPLICATIONS OF COMPUTATIONAL INTELLIGENCE   8

Printed character recognition − Inverse kinematics problems − Automobile fuel efficiency prediction − Soft computing for color recipe prediction.

Total: 45

TEXT BOOKS

1.   Jang, J.S.R., Sun, C.T. and Mizutani, E., "Neuro-Fuzzy and Soft Computing", Pearson Education, 2004.
2.   Timothy J. Ross, "Fuzzy Logic with Engineering Applications", TMH, 1997.

REFERENCES

1.   Davis E. Goldberg, "Genetic Algorithms: Search- Optimization and Machine Learning", Addison Wesley, 1989.
2.   Rajasekaran, S. and Pai, G.A.V.,   "Neural Networks- Fuzzy Logic and Genetic Algorithms", PHI, 2003.
3.   Eberhart, R., Simpson, P. and Dobbins, R., "Computational Intelligence − PC Tools", AP Professional, 1996.
4.   Sivanandham and Deepa, "Principles of Soft Computing", Wiley India Ltd, 2008.

CS1022 – SOFTWARE PROJECT MANAGEMENT

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UNIT I   FUNDAMENTALS   9

Conventional software management − Evolution of software economics − Improving software economics − Conventional versus modern software project management.

UNIT II   SOFTWARE MANAGEMENT PROCESS FRAMEWORK   9

Lifecycle phases − Artifacts of the process − Model based software architectures − Workflows of the process − Checkpoints of the process.

UNIT III   SOFTWARE MANAGEMENT DISCIPLINES   9

Iterative process planning − Organisation and responsibilities − Process automation − Process control and process instrumentation − Tailoring the process.

UNIT IV   MANAGED AND OPTIMIZED PROCESS   9

Data gathering and analysis − Principles of data gathering − Data gathering process − Software measures − Data analysis − Managing software quality − Defect prevention.

UNIT V   CASE STUDIES   9

COCOMO cost estimation model − Change metrics − CCPDS-R.

Total: 45

TEXT BOOKS

1.   Walker Royce, "Software Project Management - A Unified Framework", Pearson Education, 2004.
2.   Humphrey Watts, "Managing the Software Process", Addison Wesley, 1989

REFERENCES

1.   Humphrey Watts, "Managing the software process", Addison Wesley, 1989.
2.   Ramesh Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
3.   Bob Hughes and Mikecotterell, "Software Project Management", 3rd Edition, Tata McGraw Hill, 2004.

CS1023 – RESOURCE MANAGEMENT TECHNIQUES
(Common to CSE and IT)

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UNIT I   LINEAR PROGRAMMING   9

Principal components of decision problem − Modeling phases − LP formulation and graphic solution − Resource allocation problems − Simplex method − Sensitivity analysis.

UNIT II   DUALITY AND NETWORKS   9

Definition of dual problem − Primal − Dual relation ships − Dual simplex methods − Post optimality analysis − Transportation and assignment model − Shortest route problem.

UNIT III   INTEGER PROGRAMMING   9

Cutting plan algorithm − Branch and bound methods − Multistage (dynamic) programming.

UNIT IV   CLASSICAL OPTIMISATION THEORY   9

Unconstrained external problems − Newton-Ralphson method − Equality constraints − Jacobean methods − Lagrangian method − Kuhn-Tucker conditions − Simple problems.

UNIT V   OBJECT SCHEDULING   9

Network diagram representation − Critical path method − Time charts and resource leveling − PERT.

Total: 45

TEXT BOOKS
1.   Taha, H.A.,   "Operation Research", PHI, 2002.
2.   Anderson, "Quantitative Methods for Business", 8th Edition, Thomson Learning, 2002.

REFERENCES
1.   Winston, "Operation Research", Thomson Learning, 2003.
2.   Vohra, "Quantitative Techniques in Management" , TMH, 2002.
3.   Anand Sarma, "Operation Research", Himalaya Publishing House, 2003.

CS1024 – SOFTWARE QUALITY MANAGEMENT
(Common to CSE and IT)

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UNIT I   FUNDAMENTALS OF SOFTWARE QUALITY   9

Software quality − Hierarchical models of Boehm and McCall − Quality measurement − Metrics measurement and analysis − Gilb's approach − GQM model.

UNIT II   SOFTWARE QUALITY ASSURANCE   9

Quality tasks − SQA plan − Teams − Characteristics − Implementation − Documentation   − Reviews and Audits.

UNIT III   QUALITY CONTROL AND RELIABILITY   9

Tools for quality − Ishikawa's basic tools − CASE tools − Defect prevention and removal − Reliability models − Rayleigh model − Reliability growth models for quality assessment.

UNIT IV   QUALITY MANAGEMENT SYSTEM   9

Elements of QMS − Rayleigh model framework − Reliability growth models for QMS − Complexity metrics and models − Customer satisfaction analysis.

UNIT V   QUALITY STANDARDS   9

Need for standards − ISO 9000 Series − ISO 9000-3 for software development − CMM and CMMI − Six sigma concepts.

Total: 45

TEXT BOOKS
1.   Allan C. Gillies, "Software Quality: Theory and Management", Thomson Learning, 2003.
2.   Stephen H. Kan, "Metrics and Models in Software Quality Engineering", Pearson Education (Singapore) Pvt. Ltd., 2002.

REFERENCES
1.   Norman E. Fenton and Shari Lawrence Pfleeger, "Software Metrics", Thomson, 2003.
2.   Mordechai Ben, Menachem and Garry S.Marliss, "Software Quality" Thomson Asia Pvt. Ltd., 2003.
3.   ISO 9000-3, "Notes for the Application of the ISO 9001 Standard to Software Development".
4.   Kamna Malik and Praveen Choudry, "Software Quality : A Practitioner Approach", PHI, 2000.