B. TECH
CURRICULUM
AND
SYLLABUS

Semester I

Code	Subject	L	T	P	C
HSS 101	English for Technical Communication I	2	0	0	2
MAT 101	Mathematics I	3	0	0	3
PHY 101	Physics I	3	0	0	3
CHY 106	Chemistry	3	0	0	3
CSE 102	Programming Languages	2	0	0	2
EEE 101	Basic Electrical and Electronics Engineering	4	0	0	4
PHY 181	Physics Laboratory	0	0	3	1
CSE 181	Programming Language Laboratory	0	0	3	1
	Total	16	0	9	19

Semester II

Code	Subject	L	T	P	C
HSS 102	English for Technical Communication II	2	0	0	2
MAT 102	Mathematics II	3	0	0	3
PHY 102	Physics II	3	0	0	3
CIV 101	Basic Civil and Mechanical Engineering	4	0	0	4
CHY 101	Environmental Sciences	2	0	0	2

MEC 101	Engineering Drawing	1	0	3	2
INT 101	Introduction to Information Technology	3	0	0	3
MEC 181	Workshop	0	0	3	1
CHY 181	Chemistry Lab	0	0	3	1
	Total	19	0	6	21

Semester III

Code	Subject	L	T	P	C
MAT 208	Mathematics III	3	0	0	3
INT 201	Signals and Systems	3	1	0	4
INT 202	Digital Principles and System Design	3	0	0	3
INT 203	Operating Systems	3	1	0	4
INT 204	Data Structures & Algorithms	3	1	0	4
INT 205	Analog and Digital Communication	3	1	0	4
INT 281	Data Structures Lab	0	0	3	2
INT 282	Digital and System design Lab	0	0	3	2
INT 283	Operating Systems Lab	0	0	3	2
	Total	18	2	9	28

Semester IV

Code	Subject	L	T	P	C
HSS XXX	Humanities Elective I	3	0	0	3
MAT 221	Mathematics IV	3	0	0	3
INT 206	Object oriented programming	3	1	0	4
INT 207	Digital Signal Processing	3	1	0	4
INT 208	Microprocessors and Microcontrollers	3	0	0	3
INT 209	Computer Architecture and Organization	3	0	0	3
INT 284	Digital Signal Processing Lab	0	0	3	2
INT 285	Microprocessors & Microcontrollers Lab	0	0	3	2
INT 286	Object Oriented Programming Lab	0	0	3	2
	Total	18	3	9	26

Semester V

Code	Subject	L	T	P	C
INT XXX	Department Elective I	3	0	0	3
	Minor Elective I	3	0	0	3
INT 301	Visual Programming	3	1	0	4

INT 302	Telecommunication Systems and Switching Techniques	3	1	0	4
INT 303	Database Management systems	3	0	0	3
INT 304	Data Communication and Networking	3	1	0	4
INT 381	Communication System Lab	0	0	3	2
INT 382	DBMS Lab	0	0	3	2
INT 383	Visual Programming Lab	0	0	3	2
	Total	18	3	9	27

Semester VI

Code	Subject	L	T	P	C
HSS XXX	Humanities Elective II	3	0	0	3
INT XXX	Department Elective II	3	0	0	3
	Free Elective I	3	0	0	3
	Minor Elective II	3	0	0	3
INT 305	System Software	3	0	0	3
INT 306	Software Engineering	3	0	0	3
INT 384	Network Lab	0	0	3	2

INT 385	System Software Lab	0	0	3	2
INT 386	Software Engineering lab	0	0	3	2
	Total	18	1	9	24

Semester VII

Code	Subject	L	T	P	C
HSS XXX	Humanities - Elective III	3	0	0	3
	Free Elective II	3	0	0	3
INT XXX	Department Elective III	3	0	0	3
INT XXX	Department Elective IV	3	0	0	3
INT 401	Multimedia and Computer Graphics	3	0	0	3
INT 402	Component Based Technology	3	1	0	4
INT 481	Software Components Lab	0	0	3	2
INT 482	Multimedia and Computer Graphics Lab	0	0	3	2
	Total	18	1	6	23

Semester VIII

Code	Subject	L	T	P	C
INT XXX	Self Study Elective	3	0	0	3

INT 499	Project Work	0	0	24	8
	Total	3	0	24	11

Total Credit (from 1st semester to 8th semester = 179)

MAJOR ELECTIVES

Code	Subject	L	T	P	C
INT 307	Information Coding Techniques	3	0	0	3
INT 308	Object oriented analysis and design	3	0	0	3
INT 309	Web Technology	3	0	0	3
INT 310	Network Design Security and Management	3	0	0	3
INT 311	Mobile Communication and Computing	3	0	0	3
INT 312	Satellite Communication	3	0	0	3
INT 313	Data warehousing and mining	3	0	0	3
INT 314	Optical Communication	3	0	0	3
INT 315	Blue Tooth Technology	3	0	0	3
INT 316	Advanced DBMS	3	0	0	3
INT 403	Digital Image Processing	3	0	0	3
INT 404	Information systems	3	0	0	3

	Design				
INT 405	Wireless Application Protocol	3	0	0	3
INT 406	Optical Networks	3	0	0	3
INT 407	Enterprise Java Programming	3	0	0	3
INT 408	Enterprise Resource Planning	3	0	0	3
INT 409	Distributed systems	3	0	0	3
INT 410	Web services	3	0	0	3
INT 411	Mobile Networks	3	0	0	3
INT 412	Theory of Computation	3	0	0	3

MINOR ELECTIVES

Code	Subject	L	T	P	C
CSE 403	Soft Computing	3	0	0	3
ECE 321	Digital MOS Circuits	3	0	0	3
CSE 307	Artificial intelligence	3	0	0	3
EIE 365	Medical Electronics	3	0	0	3
CSE 365	Advanced Computer Architecture	3	0	0	3
CSE 408	Grid Computing	3	0	0	3
CSE 313	Natural Language Processing	3	0	0	3
CSE 412	Pervasive computing	3	0	0	3

HUMANITIES ELECTIVIES

Code	Subject	L	T	P	C
HSS001	Total Quality Management	3	0	0	3
HSS002	Engineering Management	3	0	0	3
HSS003	Indian Economic Development	3	0	0	3
HSS006	Professional Ethics	3	0	0	3
HSS007	Operations Management	3	0	0	3
HSS008	Basics of Economics	3	0	0	3
HSS011	Information Systems for Managerial Decision Making	3	0	0	3
HSS012	Advertising and Media Services	3	0	0	3
HSS014	Marketing Management	3	0	0	3
HSS015	Management Concepts and Techniques	3	0	0	3
HSS016	Organizational Psychology	3	0	0	3
HSS017	International Economics	3	0	0	3
HSS018	Communication Skills	3	0	0	3
HSS019	Operations Research	3	0	0	3
HSS020	Human Resource Management	3	0	0	3
HSS023	Entrepreneurship Development	3	0	0	3

SEMESTER I

HSS101	**ENGLISH FOR TECHNICAL COMMUNICATION I** (Common to all branches)	**L**	**T**	**P**	**C**
		2	**0**	**0**	**2**

FOCUS ON LANGUAGE

Parts of speech - Nominal compounds, noun phrases - Relative pronoun - Adjective - numerical, comparison and contrast, collocation and word combinations - Verb - Preposition and relative - Conjunction- connectives, expressions of purpose and function, cause and effect - Articles - adjectives - Sentence pattern - Tenses - Voice - Rewriting the sentences in impersonal/abbreviated passive grammatical structures - Concord - sentence level verb noun agreement - Gerund - rewriting infinitive into gerund - Imperative - rewriting imperative into recommendation using should - Word formation - varied grammatical function of the same word - Affixes - prefix and suffix, number prefix, negative prefix - Reported speech - Editing strategies - Conditional structures - real, unreal, no possibility, zero condition - Writing formal definition - Abbreviation and acronym - Idioms and phrases - Varieties of English - British versus American.

LISTENING SKILLS

Comprehension practice - Vocabulary development - Familiarity to varied types of spoken English and accents - Developing ability to understand audio and video media - Aiming at overcoming barriers to listening - Listening to documentaries, radio news broadcasts, TV news telecasts - Active listening in discussions and to lectures - Taking notes while listening - Extracting information from listening.

SPEAKING SKILLS

Oral practice - Role play - Interplay - Seminar - Transcoding visual into oral - Participating in short and longer conversation - Voice record, replay, correction of intonation, pronunciation and flow of speech - Phonemes - vowels, consonants, stress, rhythm, intonation -

Group discussion - Participative learning - Acquiring proficiency, fluency, accuracy in oral communication - Speaking practice - Developing confidence - Extempore speech - Learning professional/conversational etiquette.

READING SKILLS

Vocabulary Extension - Improving vocabulary - Intensive reading - Reading Strategies - identifying topic sentence - guessing meaning from content - picking out specific information - professional reading - Reading practice - Predicting the content, critical and analytical reading - Reading articles in English newspapers, sports magazines, encyclopedias - Reading aloud, use of stress and intonation - Reading and comprehending technical materials - Cloze reading.

WRITING SKILLS

Discourse Cohesion - Improving writing skills, avoiding common grammatical errors in academic writing - Extending the hints - Writing shorter sentences - Punctuation - Dialogue writing - Paragraph writing, problems and solutions, achieving coherence, transition words, sequence words - Essays of descriptive and argumentative - Writing instructions, use of imperatives - Jumbled sentences into sequential paragraph using linguistic clues - Report writing - technical reports, industry visit reports, events reports - Writing recommendations - Letter writing - formal and informal letters - job application and resume, permission for in-plant training, business correspondence letters, calling for quotation, placing order, lodging complaint, persuasive letters - Assignment writing - Mini-project - Transcoding - transferring of information from text to pictorial/graphical representation and vice versa.

TEXT BOOK

1. Rizvi M Ashraf, Effective Technical Communication, Tata McGraw-Hill, 2005.

REFERENCES

1. Daniel Jones, English Pronouncing Dictionary, Universal Book Stall, New Delhi, 17th Edition, 2000.
2. Geoffrey Leech, Fan Svartvik, A Communicative Grammar of English, Pearson Education Asia, 1994.
3. Hornby, AS, Oxford Advanced Learner's Dictionary of Current English, OUP, 7th Edition, 2005.
4. Manivannan G, English for Engineers - A Book on Scientific and Technical Writing, Govi Publications, 2005.
5. Martin Cutts, Plain English Guide - How to Write Clearly and Communicate Better, Oxford University Press, 1999.

MAT101	MATHEMATICS I (Common to all Branches)	L	T	P	C
		3	0	0	3

MATRICES

Review of Linear algebra - Matrix operations - Addition, Scalar Multiplication, Multiplication, Transpose, Adjoint and their properties - Special types of matrices - Null, Identity, Diagonal, Triangular, Symmetric, Skew-symmetric, Hermitian, Skew - Hermitian, Orthogonal, Unitary, Normal - Rank- consistency of a system of linear equations- Solution of the matrix Equation Ax = b - Row-reduced Echelon form.

EIGEN VALUE PROBLEMS

Eigen value and eigen vector of real matrix – properties of eigen values and eigen vectors – Cayley- Hamilton theorem – Orthogonal transformation of a real symmetric matrix to diagonal form – reduction of quadratic form to canonical form by orthogonal transformation – index, signature and nature of quadratic form.

DIFFERENTIAL CALCULUS

Review of limits - continuity and differentiability - Curvature – Cartesian and Parametric Co-ordinates – Centre and radius of curvature – Circle of curvature-evolutes - involutes - envelopes - partial differentiation –Euler's theorem for homogeneous functions-

total differential – Taylor's expansion (two variables) - Maxima / Minima for functions of two variables – Method of Lagrangian multiplier – Jacobians.

THREE DIMENSIONAL ANALYTICAL GEOMETRY

Direction cosines and ratios – Angle between two lines – Equations of a plane – Equations of straight line – coplanar lines – shortest distance between two skew lines – sphere – tangent plane – plane section of a sphere – orthogonal spheres.

ORDINARY DIFFERENTIAL EQUATIONS

Solutions of second and higher order linear ODE with constant coefficients – Cauchy's and Legendre's linear equations - Simultaneous first order linear equations with constant coefficients - Method of variation of parameters.

TEXT BOOKS

1. Kreyszig, E, Advanced Engineering Mathematics, John Wiley and Sons (Asia) Limited, Singapore , 8th Edn., 2001.
2. Arumugam, S., Thangapandi Isaac, A., Somasundaram, A., Engineering Mathematics Volume I, Scitech Publications (India) Pvt. Ltd., Chennai, 2nd Edn., Reprint 2000, 1999.

REFERENCES

1. Grewal , B.S., Grewal, J.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi, 37th Edn., 5th Reprint 2004, 2003.
2. Venkataraman, M. K., Engineering Mathematics First Year, The National blishing Company, Chennai, 2nd Edn., Reprint 2001, 2000.

PHY 101	PHYSICS I (Common to all Branches)	L	P	T	C
		3	0	0	3

ACOUSTICS AND STRUCTURE OF SOLIDS

Classification of sound - Reverberation, Sabine's formula , Common acoustical defects and remedies. Classification of solids - Crystal structures, X-ray diffraction, crystal growth, Crystal defects.

LASER AND FIBRE OPTICS

Interaction of radiation with matter – quantum mechanical view, three and four Level laser system, Engineering and medical applications - Introduction of fibre optics - classification of fibre, Engineering and medical applications

QUANTUM PHYSICS

Inadequacy of classical mechanics – Black body radiation, Plancks law, Photoelectric effect, Compton effect ,Einstein's photoelectric equation, Schrödinger wave equation, Particle in one, three dimensional box.

NDT,NEW ENGG.MATERIALS

Ultrasonics - Ultrasonics flaw detectors X-ray photography, Fluoroscopy, Thermography, Gamma ray spectroscopy , Characterization technique Nanophase materials, Biomaterials, Non linear materials, Polymer materials.

DIGITAL ELECTRONICS

Introduction, Analog to Digital circuits, Conversion of numbers one's complement,2's complement, Logic gates, Boolean algebra, DeMorgan's theorem, Karnaugh's maps.

TEXT BOOK

1. Gaur R. K. and Gupta S. L., Engineering Physics, Dhanpat Rai Publishers, New Delhi, 2001.

REFERENCES

1. Murthy V.S.R.., Jena AK., Gupta K.P. and Murthy G.S., Structures and Properties of Engineering Materials, Tata McGraw Hill Publishing company Limited, New Delhi, 2003.
2. 2. Ali Omar. M., Elementary Solid State Physics, Pearson Education (Singapore), Indian Branch, New Delhi, First Edition, 2006.
3. William F. Smith., Foundations of materials science and Engineering, McGraw-Hill, New York, 3rd Edition , 2003.
4. 4. Mathews. P.M., Venkatesan. K., Text Book of Quantum Mechanics, Tata McGraw Hill company, Delhi, 2003.
5. Gupta S.L., Kumar.V., Hand book of Electronics, Pragati Prakashan, Meerut, 28th Edition, 2001.

CHY106	CHEMISTRY (Common to CSE & IT)	L	T	P	C
		3	0	0	3

WATER

Water Quality Parameter (Industry and Drinking Water) – Hardness, Definition, Classifications, Expressions, Units of Hardness of Water with respect to $CaCO_3$, Problems - Estimation of Hardness by EDTA Method (Theory Only) - Definition of Alkalinity (Theory Only) – Boiler feed water - Requirements, Disadvantages of using hard water in boilers, Removal of boiler scales and sludges - Water Softening - Zeolite Process, Demineralization (Ion – Exchange Process), Desalination.

CORROSION SCIENCE AND CONTROL ENGINEERING

Corrosion,definitions – Electrode potential - Principles of Dry and Wet Corrosion, Factors Influencing rate of corrosion, Types of Corrosion - Corrosion Control – Impressed Current Cathodic Protection and Sacrificial Anodic Protection Method - Corrosion Inhibitors – Protective Coatings, Surface conversion coatings, organic coatings (paints).

POLYMERS

Introduction, Classification, Difference Between Thermoplastic and Thermosetting Plastics – Properties of Plastic - Degree of Polymerization – Types of Polymerization (Mechanism) - Phenol Formaldehyde Resin, Epoxy Resin, polyurethanes, Teflon -Amino Resins (Urea Formaldehyde, Nylon.11, Nylon.66 & Nylon 6), PET, PVC – Composites - Definition, characteristics, Constituent. Types-Fibre reinforced plastics (FRP), Metal Matrix Composites (MMC), Ceramic Matrix Composites (CMMC),Properties and Applications.

INSTRUMENTAL METHODS OF ANALYSIS

Electro Magnetic Radiation - Absorption of Radiation , Beer - Lambert's Law – UV-VIS. Spectroscopy – IR Spectroscopy - Principle and Instrumentation (Black Diagram Only) Estimation of Iron by Colorimetry – Flame Photometry, Principle and Instrumentation (Black Diagram Only), Estimation of Na by Flame Photometry - Atomic Absorption Spectroscopy, Principle and Instrumentation (Block Diagram Only), Quantitative Estimation of Nickel by Atomic Absorption Spectroscopy.

ENERGY AND MEMORY STORAGE DEVICES AND NANOTECHNOLOGY

Batteries - Introduction, Primary and Secondary Batteries - Dry Cell - Alkaline Batteries, Lead Acid Storage Cell, NICAD Battery, Lithium Batteries – Fuel Cell (Hydrogen - Oxygen Fuel Cell) – Photo Galvanic Cell - Ferrites – Definition, Properties, Manufactures and uses – Ferrite Core – Magnetic Core – Transformer – Ferrite Toroids – Semicoducotor storage - Optical disc Storage – Magneto-optical disc storage – Chemical sensors - Nanotechnology – Introduction, Preparation, Characterization and Application.

TEXT BOOKS

1. Jain,P.C and Monika Jain, Engineering Chemistry, Dhanpat Rai Publishing company (P) Ltd., New Delhi, 14th Edition 2002.

2. Sharma, B.K., Industrial Chemistry, Goel Publishing House, Meerut, 12th edition 2001.

REFERENCE BOOKS

1. Puri B.R.and Sharma L.R. Principles of Physical Chemistry, Shoban Lal Nagin Chand & Co., Jalandhar, 40th edition 2003.
2. Vogel A.I., A text book of Quantitative Inorganic Analysis, ELBS, London, 3rd edition 2000.
3. Mick Wilson and Kamali Kannangara, Nanotechnology: Basic science and emerging technology, Overseas India Pvt. Ltd. Press, New Delhi, Ist edition 2005.
4. Bandyopadhyay, A.K., Nano Materials, New Age International Publishers, New Delhi, 1st edition 2007.

CSE102	PROGRAMMING LANGUAGES (Common to all branches)	L	T	P	C
		2	0	0	2

BASIC ELEMENTS OF C & CONTROL STATEMENTS

Introduction to C- Structure of C language – Lexical elements of C- Operators and Expressions-Operator precedence and associativity of operators -Input and Output Functions-Library Functions –Header Files-Simple Computational problems. Decision Making: if statement - if-else statement - else-if ladder - switch statement – Looping Control Structure - the break statement - ? : operator - Continue statement - goto statement – Problems using Control Structures.

FUNCTIONS, PROGRAM STRUCTURES & ARRAYS

Prototypes and Functions – Declaring, defining and accessing Functions- Parameter passing methods-Recursion - Storage Classes - Automatic Variables -External Variables – Static and Register Variables – Programs using functions. Defining and Processing an Array - Passing Arrays to Functions - Multidimensional Arrays - Arrays and Strings - Enumerated data types-Programs using sorting, searching and merging of arrays.

POINTERS, STRUCTURES & UNIONS

Pointer Fundaments - Pointer Declarations - Passing Pointers to Functions - Arrays and Pointers - Pointers and One-Dimensional Arrays - Pointers and Multidimensional Arrays - Operations on Pointers - Pointers and Structures - Dynamic Memory Allocation – Command Line Arguments – Programs using Pointers with Functions, Arrays and & Structures. Defining a Structure - Processing a Structure - User-Defined Data Types – Union – Nested structure - Structures and Pointers - Passing Structures to Functions - Self Referential Structures.

DATA FILES & DATA STRUCTURES

Opening and Closing a Data File - Creating a Data File - High Level File Operations - Processing and Updation of Data Files - Unformatted Data Files - Low Level Programming – File Handling Programs. Linked List – Creation, Insertion and Deletion of elements - Stack and Queue implementation using Linked List.

UNIX BASICS & SHELL PROGRAMMING

Shell Fundamentals - Shell Commands - Shell Decisions and Repetitions - Command line usage - Wildcard expansion - Redirection of I/O, pipes and filters. Shell Programming - Simple scripts - Specifying the interpreter - Shell variables - The Environment - Control flow; test, if, for, while, case - Command substitution - Signal catching - Shell functions - Aliases - Reading from the Standard I/P - Startup Files - basename and dirname - Expression evaluation.

TEXT BOOKS

1. Byron S. Gottfried, Theory and Problems of Programming with C, Tata McGraw Hill, Second Edition, 1996.
2. Lowell Jay Arthur and Ted Burns, UNIX Shell Programming, John Wiley & Sons Canada, Ltd, Fourth Edition, 1997.
3. Deshpande P.S, Kakde O.G, C & Data Structures , Dreamtech Press, First edition, 2004

REFERENCES

1. Brian Kerninghan W, Dennis Richie M, The C Programming language, Pearson Education,2005.
2. Johnsonbaugh R.and Kalin M, Applications Programming in ANSI C, Pearson Education, Third Edition ,2003.
3. Behrouz A.Forouzan and Richard Gilberg F, A Structured Programming Approach Using C, Brooks-Cole Thompson Learning Publications, Second Edition, 2001.
4. Bruce Molay, Understanding UNIX/LINUX Programming: A Guide to Theory and Practice, Prentice Hall, First Edition, 2002.
5. Glass, G., Ables, K. UNIX for Programmers and Users, Prentice Hall, 1999.
6. Stephen Kochan and Patrick Wood, UNIX Shell Programming, Pearson Education, Third Edition, 2003.

	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (common to all branches)	**L**	**T**	**P**	**C**
EEE101		**4**	**0**	**0**	**4**

ELECTRICAL CIRCUITS

Introduction to electric circuits – laws of electric circuits– Ohm's Law, Kirchoff's Laws– analysis of DC circuits–mesh, nodal – introduction to AC circuits– average Value, RMS value, power and power factor–analysis of 3 phase AC circuits – balanced and unbalanced circuits

ELECTRICAL MACHINES

DC Machines –principle of operation–DC generators–emf equation, characteristics, types– DC motors–shunt, series, compound– single phase transformer – principle of operation, emf equation, phasor diagram –induction motors–single phase, three phase–alternators– principle of operation, emf equation , characteristics

ELECTRICAL MEASUREMENTS

Moving coil –ammeter, voltmeter – moving iron instruments – ammeter, voltmeter – dynamometer – wattmeter, energy meter

BASIC ELECTRONICS

Semiconductor devices – introduction, construction, types – pn junction diode –working principle, characteristics– zener diode– working principle, characteristics uni–junction transistor– operation, characteristics –field effect transistor– operation, characteristics– bipolar junction transistor– operation, characteristics–applications– half wave and full wave rectifiers

DIGITAL ELECTRONICS

Introduction to binary number system–logic gates –AND, OR, NOT, NAND, NOR, exclusive OR–boolean algebra– combinational circuits – half adder, full adder, half subtractor, full subtractor

INTEGRATED CIRCUITS

Operational amplifier–introduction, DC characteristics, AC characteristics–types of operational amplifier–inverting, non–inverting– applications– scalar, adder, Subtractor, differentiator, and integrator

TEXT BOOKS

1. Edward Hughes., Electrical &Electronics Technology, Pearson Education ltd, 9th edition, 2005.
2. Kothari.D.P.,and.Nagrath.I.J.,Basic Electrical Engineering, Tata McGraw Hill,2nd Edition.

REFERENCES

1. Malvino,A P., Electronic Principles, TataMcGraw Hill International, 1998.
2. Vincent Del tora.,Electrical Engineering fundamentals, Prentice hall of India , 2nd edition 2003.

3. Muraleedharan.K.A., Muthusubramanian .R., and Salivahanan .S., Basic Electrical and Electronics and Computer Engineering, Tata McGraw Hill, 1997.

PHY 181	PHYSICS LABORATORY (Common to all Branches)	L	P	T	C
		0	0	3	1

1. To determine the acceleration due to gravity using Compound Pendulum
2. To determine the Rigidity Modulus of wire using Torsional Pendulum
3. To find thickness of the given two glass plates using single optic lever
4. To determine the thermal conductivity of a bad conductor – Lee's disc method.
5. To determine the refractive index of the material of the prism
6. To find the prominent wave length of mercury spectrum using grating
7. To determine the particle size using Laser
8. To determine the coefficient of viscosity of the liquid by Poiseuille's method
9. To determine the young's modulus of given material using Uniform Bending
10. To Determine the thickness of a given material using Air wedge method
11. To determine the focal length of a biconvex lens using Newton's Rings method
12. To determine the velocity of ultrasonic waves in the liquid using ultrasonic Interferometer.

		L	T	P	C
CSE181	PROGRAMMING LANGUAGES LABORATORY (Common to all branches)	0	0	3	1

WORD PROCESSING, SPREADSHEET, POWERPOINT

1. To create an advertisement in Word.
2. To illustrate the concept of mail merging in word.
3. To create a spread sheet to analyze the marks of the students of a class and also to create appropriate charts.
4. To create the presentation for the department using Power Point.

C PROGRAMMING

5. To write a simple menu driven calculator program using switch statement
6. To write a program to print Pascal's triangle.
7. To write a program for electricity bill preparation.
8. To write a program to print the sine and cosine series.
9. To print Fibonacci series up to N numbers.

ARRAYS AND FUNCTIONS

10. To write a program to perform Matrix multiplication.
11. To write a program to sort a given set of numbers.
12. To write a program to perform string manipulation manipulations function like string concatenations, comparison, find the length and string copy without using library functions.
13. To write a program to arrange names in alphabetical order.
14. To write a C program to check whether a number is palindrome or not using functions.
15. To write a program to calculate the factorial of the given number using functions.

POINTERS, STRUCTURES AND FILES

16. To print the mark sheet of n students using structures.

17. To write a program using pointers to access the elements of an array and count the number of occurrences of the given number in the array.
18. To write a program for find the average of numbers using files.
19. To write a program to merge the given two files arguments using command line arguments.

UNIX PROGRAMMING

20. Study of Basic UNIX Commands.
21. Implement ls Command.
22. Write a shell script to determine the properties of a given file.
23. Implement grep function.
24. Write a shell script to find the factorial of given number.
25. Write a shell script to evaluate the given expression using switch-case.

SEMESTER II

		L	T	P	C
HSS102	**ENGLISH FOR TECHNICAL COMMUNICATION II** (Common to all branches)	**2**	**0**	**0**	**2**

GRAMMAR AND VOCABULARY

Grammar and Vocabulary - Introduction to grammatical models - Proper use of tenses, concord, voice, articles, punctuation, and modal auxiliaries.

RECEPTION SKILLS

Listening and Language Development - Improving listening skills - comprehension practice - Comprehend classroom lectures, simple technically oriented passages - Listening to news bulletins, pre-recorded talks, different speech styles, comprehending the essential meaning - Physical and psychological barriers to listening - Steps to overcome the barriers - Practice in note-taking while listening.

SPEAKING TECHNIQUES

Speaking practice - Improving conversing skills - Improving self-expression - Developing confidence and fluency in oral communication - Physical and psychological barriers to speaking - Steps to overcome the barriers - Formal and public speaking practice - Extemporary talk practice - Speech process - fluency and accuracy in speech - Developing persuasive speaking skills - Conversation in a given milieu, social and cultural surroundings - Practice in giving small talks on local topics for a minute or two - Goal oriented group discussion - Participating in seminars - Independent and effective communication.

READING STRATEGIES

Reading comprehension - Vocabulary extension methods - Speed reading practice - technical and non-technical materials - Practice in various reading techniques - skimming, scanning, eye reading -

Looking for specific information - Comprehending the given passages, technical information.

WRITTEN COMMUNICATION

Basic grammatical structures - Alphabet of other languages - Paragraph writing - Expressing the idea in writing - Avoiding and correcting common errors - Effective writing techniques - brevity, clarity, objectivity and simplicity - Discourse writing - definition, description, instruction - Note-making - Proof reading - Mechanics of writing - Writing formal, informal letters, Technical reports - Reference skills - using dictionary better.

TEXT BOOKS

1. Rizvi M Ashraf, Effective Technical Communication, Tata McGraw-Hill, 2005.
2. Rutherfoord Andrea J, Basic Communication Skills for Technology, Pearson Education, 2002.

REFERENCES

1. Deborah C Andrews, Margaret D Bickle, Technical Writing - Principles and Forms, Macmillan, 1978.
2. Manivannan G, English for Engineers - A Book on Scientific and Technical Writing, Govi Publications, 2005.
3. Sarah Freeman, Written Communication in English, Orient Longman, 2000.
4. Thomson A J & AV Martinet, A Practical English Grammar, OUP, 4th Edition, 1986.
5. Tom Hutchinson, Alan Waters, English for Specific Purpose, Cambridge University Press, 1987.

MAT102	MATHEMATICS II (Common to all Branches)	L	T	P	C
		3	0	0	3

SEQUENCES AND SERIES

Convergence and divergence of infinite series – series of positive terms – comparison, D'Alembert's ratio, Raabe's and Cauchy's root tests – Convergence of alternating series – Leibnitz's test (proof of theorems and tests not included) – elementary notions of absolute and conditional convergence - Power series – Taylor's theorem(one variable).

ANALYTIC FUNCTION AND CONFORMAL MAPPING

Function of a complex variable – Analytic function – Necessary conditions – Cauchy – Riemann equations – Sufficient conditions (excluding proof) – Properties of analytic function – Harmonic conjugate – Construction of Analytic functions - Conformal mapping - w = z+a, az, 1/z, e^z, sin z, cos z and bilinear transformation – fixed points – cross ratio.

COMPLEX INTEGRATION

Statement and application of Cauchy's integral theorem and integral formula – Taylor and Laurent expansions – Isolated singularities – Residues - Cauchy's residue theorem - Contour integration over unit circle and semicircular contours (excluding poles on boundaries)- evaluation of real integrals using contour integration.

MULTIPLE INTEGRALS

Review of Riemann integrals - Double integration – Cartesian and polar coordinates – change of order of integration – change of variable between Cartesian and polar – area as double integral – Triple integration in Cartesian, cylindrical and spherical polar coordinates – volume as triple integral.

VECTOR CALCULUS

Gradient, Divergence and Curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green's theorem

in a plane, Gauss divergence theorem and Stoke's theorem (excluding proof) – Simple applications

TEXT BOOKS

1. Kreyszig, E, Advanced Engineering Mathematics, John Wiley and Sons (Asia) Limited, Singapore , 8th Edn., 2001.
2. Arumugam, S., Thangapandi Isaac, A., Somasundaram, A., Engineering Mathematics Volume II, Scitech Publications (India) Pvt. Ltd., Chennai, 1st Edn., Reprint 2000, 1999.

REFERENCES

1. Grewal , B.S., Grewal, J.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi, 37th Edn., 5th Reprint 2004, 2003.
2. Venkataraman, M. K., Engineering Mathematics First Year, The National Publishing Company, Chennai, 2nd Edn., Reprint 2001, 2000.
3. Venkataraman, M. K., Engineering Mathematics –III A, The National Publishing Company, Chennai, 11th Edn., Reprint 2002, 1998.

PHY 102	PHYSICS – II (Common to CSE and IT)	L	P	T	C
		3	0	0	3

VOLTAGE AND CURRENT LAWS

Kirchoff's current law, Kirchoff's Voltage law, Single loop circuit, single node-pair circuit, Series and parallel connected independent sources, Resistors in series and parallel, Voltage and current division

CIRCUIT ANALYSIS TECHNIQUES:

Linearity and superposition, Sources transformation, Thevenin and Norton equivalentcircuits, Maximum power transfer, Dela-Wye conversion, Single Phase and 3 Phase Circuits, Power factor, Power, Concept of Phasor Diagrams.

SEMICONDUCTOR DEVICES:

Conductors, Semiconductors, Silicon crystals, ideal diode, diode approximation, zener diode, zener regulator- Bipolar transistors- Basic ideas of junction FET, Depletion mode MOSFET, Enhancement mode MOSFET and Silicon control rectifier

RECTIFIER, AMPLIFIER AND OSCILLATOR:

Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Filter, Choke input filter,Capacitors input filter, Zener Regulator. Un-biased transistor, Biased transistor, transistor currents, JFET Amplifier. Theory of Sinusoidal Oscillation, RC Oscillators, LC Oscillators, 555 Timer, 555 Circuits.

OPERATIONAL AMPLIFIER

Introduction of an Inverting Amplifier, Non Inverting Amplifier, Basic Application of perational amplifier: Subtractor, Summing Amplifier, Digital to Analog Converter, Low Pass Filter, First Order Low Pass Filter, First Order High Pass Filter, Integrator, Differentiator, Relaxation Oscillator.

TEXT BOOK

1. Albert Paul Malvino, Electronic Principles, Tata McGraw-Hill Publishing Company Limited, Sixth Edition, 1999.

REFERENCES

1. William H. Hayt, Jack E.Kemmerly, Steven M.Durbin, Engineering Circuit Analysis, Tata McGraw-Hill Publishing Company, Sixth Edition, 2002.
2. Robert L. Boylestad, Louis Nashelsky, Electronic devices and Circuit Theory, Pearson Education Asia, Eigth Edition, 2002.
3. Floyd, Electronic Devices, , Pearson Education, Sixth-Edition, 2002.
4. David A. Bell, “Electronics Devices and Circuits”, Fourth Edition-Prentice Hall of India, 1999.

CIV 101	BASIC CIVIL AND MECHANICAL ENGINEERING (Common to all Branches)	L	T	P	C
		4	0	0	4

CIVIL ENGINEERING

BUILDINGS

Characteristics of good building materials such as stones, bricks, plywood and ceramic tiles, timber, cement, aggregates and concrete - Basic functions of buildings – Major components of buildings – Foundations - Purpose of a foundation – Bearing capacity of soils – types of foundations. Proper methods of construction of Brick masonry – Stone masonry – Hollow Block masonry. Beams – Lintels – Columns – Flooring – Damp proof course – surface finishes – Doors and windows – Roofing.

TRANSPORTATION ENGINEERING

Principles and Classification of surveying, Chain surveying, Compass surveying and leveling - Importance of roads – Classification of Highways –water bound macadam, bituminous and cement concrete roads –. Railways - Importance of railways – Gauges – Components of a permanent way. Bridges - Components of Culverts – Causeways, Slab Bridge, T-beam and slab bridge, Suspension bridge

MECHANICAL ENGINEERING

BOILERS AND TURBINES

Boilers - boiler mountings and accessories – Cochran boiler, Locomotive boiler, Babcock and Wilcox boiler, fire and water tube boilers - Steam turbine - single stage impulse turbine, Parson's reaction turbine, difference between impulse and reaction turbines.

POWER PLANTS AND INTERNAL COMBUSTION (IC) ENGINE

Classification of power plants – steam, nuclear, diesel and hydro power plants - Alternate sources of energy - solar, wind, tidal,

geothermal, ocean thermal energy conversion. – IC engine - components, working of four and two stroke petrol and diesel engines.

PRODUCTION TECHNOLOGY

Metal casting and forming process –patterns, moulding, melting of cast iron, casting – forging – rolling – extrusion – drawing - Metal joining process - welding – arc welding, gas welding, brazing and soldering - Metal machining – lathe, drilling machine, milling machine, shaping machine, planing machine, introduction to Computer Numerical Control machining.

TEXT BOOK

1. Shanmugam, G,, and Palanichamy, M.S., Basic Civil and Mechanical Engineering, Tata McGraw Hill Publishing Co., New Delhi, 1996.

REFERENCES

1. Khanna, K., Justo C E G, Highway Engineering, Khanna Publishers, Roorkee, 2001
2. Arora S.P. and Bindra S.P., Building Construction, Planning Techniques and Method of Construction, Dhanpat Rai and Sons, New Delhi, 1997.
3. Venugopal K., Basic Mechanical Engineering, Anuradha Publications, Kumbakonam, 2000.
4. Shanmugam G., Basic Mechanical Engineering, Tata McGraw Hill Publishing Co.,New Delhi, 2001.

CHY 101	ENVIRONMENTAL SCIENCES (Common to all branches)	L	T	P	C
		3	0	0	3

NATURAL RESOURCES

Definitions – Scope of Environmental Sciences - Forest Resource – Food Resource – Land Resource – Water – Mineral resources - Utilization of Natural Resource, Impact on Environment – Conservation of Natural Resources.

ECOSYSTEM AND BIODIVERSITY

Concept – Structure and Function – Energy Flow in Ecosystem – Ecological Succession – Food Chain – Food Web, Ecological Pyramids – Biodiversity, Definition, Values, Threats to Biodiversity, Conservation of Biodiversity.

ENVIRONMENTAL POLLUTION

Definition, Causes, Effects and Control Measures of Air, Water and Soil Pollution – Thermal and nuclear Pollution.

MANAGEMENT OF ENVIRONMENTAL POLLUTION

Solid Waste Management – Treatment Methods adopted for Municipal Sewage and Industrial Effluent – Hazardous and Biomedical Waste Management.

TOOLS FOR ENVIRONMENTAL MANAGEMENT

Environment Impact Assessment – Precautionary and Polluter Pay Principle - Constitutional Provision – (Air, Water and Forest) - Waste Minimization Techniques, Cleaner Technology Options, Bioremediation.

REFERENCES

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad, 1st edition 2001.
2. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co. USA, 2nd edition 2004.
3. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media., New Delhi, 2nd edition 2004.
4. Masters, G. M., Introduction to Environmental Engineering & Science, Prentice Hall, New Delhi, 2nd edition 1997
5. Henry, J. G. and Heike, G. W. Environmental Science & Engineering, Prentice Hall International Inc., New Jersey, 1st edition 2005.

MEC101	ENGINEERING DRAWING (Common to all Branches)	L	T	P	C
		1	0	3	2

INTRODUCTION

Importance of graphics – use of drafting instruments – BIS conventions and specifications – size, layout and folding of drawing sheets – lettering dimensioning and scales - Orthographic principles - free hand sketching in first angle projection from pictorial views.

PROJECTION OF POINTS, STRAIGHT LINES AND PLANES

Projection of points, located in all quadrants - projection of straight lines located in the first quadrant, determination of true lengths and true inclinations, location of traces - projection of polygonal surface and circular lamina located in first quadrant inclined to one or both reference planes.

PROJECTION AND SECTION OF SOLIDS

Projection of solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method. Section of above solids in simple vertical position by cutting planes inclined to any one of the reference planes, obtaining true shape of section.

DEVELOPMENT OF SURFACES

Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones - development of lateral surfaces of combined solids – prism and cylinder, cylinder and cylinder with axes at right angles with no offset.

ISOMETRIC AND PERSPECTIVE PROJECTION

Principles of isometric projection – isometric view and projections of simple solids, truncated prisms, pyramids, cylinders and cones. Perspective projection of prisms, pyramids and cylinders by visual ray and vanishing point methods.

TEXT BOOK

1. Bhatt, N.D., Engineering Drawing, Charotar publishing House, New Delhi, 46th Edition, 2003.

REFERENCES

1. Nataraajan, K.V., A text book of Engineering Graphics, Dhanalakshmi Publishers, Chennai, 2006.
2. Shah, M.B., and Rana, B.C., Engineering Drawing, Pearson Education, New Delhi, 2005.
3. Gopalakrishnana, K.R., Engineering Drawing (Vol. I and II), Subhas Publications, 1998.
4. Luzadder and Duff, Fundamentals of Engineering Drawing, Prentice Hall of India Pvt Ltd, New Delhi, XI Edition, 2001.
5. Venugopal, K., Engineering Graphics, New Age International (P) Limited, 2002.

INT 101	INTRODUCTION TO INFORMATION TECHNOLOGY	L	T	P	C
		3	0	0	3

INTRODUCTION TO COMPUTER

Generations of computer - basic operation of computer – Architecture - data- Information Age - Responses – Information system – hardware - software.

COMMUNICATION NETWORKS

Introduction to Analog communication – Transmitter – Receiver - basic principles of modulation - Communication process - source of information – channels - Noise - System noise sources - Noise & feed back - Noise figure - Introduction to Digital communication - Transmitter-Receiver Sampling theorem - Sampling of Band pass and low pass – digital modulation.

INFORMATION TECHNOLOGY INFRASTRUCTURE

Basic laws - moore's law,metcase law, gilder's law – Infrastructure – Internet and Intranet; operation and services provided - WWW- Bluetooth technology - IT support for organizations - Types of

information systems – Managing IT – Basic of computer hardware and software for IT infrastructure - Data bases - logic Data Models .

INFORMATION TECHNOLOGY MANAGEMENT

Planning and Management - Principles for IS planning - Role of IS and user departments – Resources - IT architecture - Centralized and no centralized - Client/server - End user computing architecture - Managing IS - Organizational structure - IS vulnerability- protection – Security - Network Protection and Firewalls Risk management and cost -Benefit analysis.

IT APPLICATIONS:

Information system -GIS EDI and EFT – Extranets – Implementation - Data,E-commerce,e-learning-e-research - Knowledge and decision support - Decision making - and support systems - Data visualization technologies - Discovery and analysis - AI and IS - Expert systems - Intelligent gents.

TEXT BOOKS

1. Turban et al, E ., Introduction to IT, John Wiley and sons, IC, 2000.
2. Turban et al , E., IT for management Making connection for strategic Advantage, John Wiley and sons, 2nd Edition, Inc., 2001.

REFERENCES

1. Dennis, P., Curtin et al., IT, the breaking wave, Tata McGraw-Hill, 1999.
2. Steven Alter ,IT, A management perspective, 1999.
3. Rajaram,v., Introduction to IT, Prentice-Hall of India, 2003
4. Yadav, D.S., Foundation of IT, New age international ltd publishers , Chennai 2003

MEC181	WORK SHOP (common to all branches)	L	T	P	C
		0	0	3	1

CARPENTRY

Carpentry tools - practice in marking, sawing, planing and chiseling – making simple joints: lap joint, T-joint, dovetail joint, mortise and tenon joint.

FITTING

Fitting tools - practice in marking, filing, punching, hacksawing - fitting to size and drilling - making of simple mating profiles: V, square, dovetail, half round joints.

SHEET METAL

Study of press, die and tools - sheet metal layout - development of lateral surfaces -simple exercises: blanking, forming, bending and flanging.

DRILLING

Drilling and tapping in drilling machines

Demonstration on:

i) Welding operations like butt joint and lap joints in Arc welding
ii) Foundry operations like mould preparation for split pattern
iii) Smithy operations like the production of hexagonal bolt
iv) Preparation of plumbing line sketches – basic pipe connections involving the fittings like valves, taps, couplings, unions, reducers, elbows and other components used in household fittings.

CHY181	CHEMISTRY LABORATORY (Common to all branches)	L	T	P	C
		0	0	3	1

1. Preparation of standard and buffer solutions.
2. Estimation of hardness of water sample by EDTA method
3. Determination of dissolved oxygen in a sample of water.

4. Estimation of chloride and fluoride ion in water sample.
5. Determination of alkalinity of water sample.
6. Estimation of hydrochloric acid by pH titration
7. Estimation of ferrous ion by potentiometer titration
8. Estimation of mixture of acid by conduct metric titration
9. Estimation of iron by spectrophotometric method.
10. Flame photometry – Determination of Na & K

SEMESTER III

MAT208	MATHEMATICS III	L	T	P	C
		3	0	0	3

LAPLACE TRANSFORM

Definition of Laplace Transform- Linearity property - condition for existence of Laplace Transform - First & Second Shifting properties - Laplace Transform of derivatives and integrals - Unit step functions - Dirac delta-function - Differentiation and Integration of transforms - Convolution Theorem - Inversion - Periodic functions - Evaluation of integrals by Laplace Transform - Solution of boundary value problems.

FOURIER SERIES

Dirichlet's conditions – General Fourier series – odd and even functions – Half range sine and cosine series – complex form of Fourier series – Parseval's identity – Harmonic analysis.

FOURIER TRANSFORM

Fourier Integral formula - Fourier Transform - Fourier sine and cosine transforms - Linearity, Scaling, frequency shifting and time shifting properties - Self reciprocity of Fourier Transform - Convolution theorem - Application to boundary value problems.

SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS

Method of false position - Newton – Raphson - Iterative method - Solutions of a linear system by Gaussian, Gauss-Jordan, Jacobi and Gauss – Seidel methods - Eigen value of a matrix by Power method.

INTERPOLATION, NUMERICAL DIFFERENTIATION AND INTEGRATION

Newton forward and backward difference formulae - Newton's divided difference formulae - Lagrange's polynomials - Numerical

differentiation with interpolation polynomials - Numerical integration by Trapezoidal and Simpson's (both 1/3rd and 3/8th) rules.

TEXT BOOKS

1. Kreyszig, E, Advanced Engineering Mathematics, John Wiley and Sons (Asia) Limited, Singapore , 8th Edn., 2001.
2. Arumugam, S., Thangapandi Isaac, A., Somasundaram, A., Engineering Mathematics Volume II, Scitech Publications (India) Pvt. Ltd., Chennai, 1st Edn., Reprint 2000, 1999.
3. Arumugam, S., Thangapandi Isaac, A., Somasundaram, A., Numerical Methods, Scitech Publications (India) Pvt. Ltd., Chennai, 2nd Edn., Reprint 2006, 2001.

REFERENCES

1. Grewal , B.S., Grewal, J.S., Higher Engineering Mathematics, Khanna Publishers, New Delhi, 37th Edn., 5th Reprint 2004, 2003.
2. Venkataraman, M. K., Engineering Mathematics –III A, The National Publishing Company, Chennai, 11th Edn., Reprint 2002, 1998.
3. Venkataraman, M. K., Engineering Mathematics - III B, The National Publishing Company, Chennai, 13th Edn., Reprint 1999, 1998.
4. Jain, M.K., Iyengar, S.R.K., Jain, R.K., Numerical Methods for Scientific and Engineering Computation, New Age International (P) Ltd., New Delhi, 4th Edn., 2003.

INT 201	SIGNALS AND SYSTEMS	L	T	P	C
		3	1	0	4

CLASSIFICATION OF SIGNALS AND SYSTEMS

Continuous time signals (CT signals) - discrete time signals (DT signals) – Representation - step, Ramp, Pulse, Impulse, Exponential - Classification of CT and DT signals - periodic and a periodic, Random signals- CT systems and DT systems - Classification of systems – Linear Time Invariant Systems.

ANALYSIS OF CT SIGNALS

Fourier series analysis - Spectrum of CT signals - Fourier Transform and Laplace Transform in Signal Analysis - Fourier Methods and Laplace transforms in analysis.

LTI-CT SYSTEMS

Differential equation - Block diagram representation - Impulse response - Convolution Integral, Frequency response - State equations and Matrix.

ANALYSIS OF DT SIGNALS

Spectrum of DT Signals - Discrete Time Fourier Transform (DTFT) - Discrete Fourier Transform (DFT) - Z-transform, Properties of Z-transform in signal analysis.

LTI-DT SYSTEMS

Difference equations - Block diagram representation - Impulse response - Convolution SUM - Frequency response - FFT and Z-transform analysis - State variable equation and Matrix.

TEXTBOOK

1 Alan Oppenheim, V.Alan Willsky S., with Hamid Nawab, S., Signals & Systems, Pearson Education, PHI, 2003.

REFERENCES

1. Lindner, K. Signals and Systems, McGraw-Hill International, 1999.
2. Simon Haykin and Barry Van Veen,Signals and Systems, John Wiley & Sons, Inc. 1999.

INT 202	DIGITAL PRINCIPLES AND SYSTEM DESIGN	L	T	P	C
		3	0	0	3

BOOLEAN ALGEBRA AND LOGIC GATES

Review of binary number systems - Binary arithmetic – Binary codes – Boolean algebra and theorems - Boolean functions – Simplifications of Boolean functions using Karnaugh map and tabulation methods – Logic gates

COMBINATIONAL LOGIC

Combinational circuits – Analysis and design procedures - Circuits for arithmetic operations - Code conversion – multilevel NAND circuits-multilevel NOR circuits-Introduction to Hardware Description Language (HDL)

DESIGN WITH MSI DEVICES

Decoders and encoders - Multiplexers and demultiplexers - Memory and programmable logic - HDL for combinational circuits

SYNCHRONOUS SEQUENTIAL LOGIC

Sequential circuits – Flip flops – Analysis and design procedures - State reduction and state assignment - Shift registers – Counters - HDL for sequential logic circuits, Shift registers and counters.

ASYNCHRONOUS SEQUENTIAL LOGIC

Analysis and design of asynchronous sequential circuits - Reduction of state and flow tables – Race-free state assignment – Hazards-Digital integrated circuits-RTL and DTI, I2L,TTL, MOS,CMOS,

TEXT BOOK

1. Morris Mano, M., Digital Design, Pearson Education, 3rd edition, 2002.

REFERENCES

1. 1. Charles H.Roth, Jr., Fundamentals of Logic Design, Jaico Publishing House, 4th Edition, 2000.
2. Donald D.Givone, Digital Principles and Design, Tata McGraw-Hill, 2003.

INT 203	OPERATING SYSTEMS	L	T	P	C
		3	1	0	4

INTRODUCTION

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 - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication.

PROCESS MANAGEMENT

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.

SYSTEM MODEL

Deadlock Characterization – Methods for handling Deadlocks - Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

MEMORY MANAGEMENT

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

FILE SYSTEMS

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

TEXT BOOKS

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, Operating System Concepts, John Wiley & Sons (ASIA) Pvt. Ltd, Sixth Edition, 2003.

REFERENCES

1. Harvey M. Deitel, Operating Systems, Pearson Education Pvt. Ltd, Second Edition, 2002.
2. Andrew S. Tanenbaum, Modern Operating Systems, Prentice Hall of India Pvt. Ltd, 2003.
3. William Stallings, Operating System, Prentice Hall of India, 4th Edition, 2003.

4. Pramod Chandra P. Bhatt, An Introduction to Operating Systems, Concepts and Practice, PHI, 2003.

INT 204	DATA STRUCTURES & ALGORITHMS	L	T	P	C
		3	1	0	4

ALGORITHM DESIGN TECHNIQUES

Introduction – Algorithms design techniques with examples - Divide and conquer- Strassen's Matrix multiplication algorithm - Towers of Hanoi Greedy method - Dijkstra's shotest path algorithm-Travelling Sales Person Problem

LISTS, STACKS AND QUEUES

Abstract Data Type (ADT) – The List ADT,linked list – singly - double- circular – The Stack ADT – The Queue ADT – circular

TREES

Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining

SORTING

Preliminaries – Insertion Sort – Shellsort – Heapsort – Mergesort – Quicksort – External Sorting - Topological Sort– Applications of Depth-First Search – Undirected Graphs – Biconnectivity – Introduction to NP-Completeness

DYNAMIC PROGRAMMING AND SEARCHING TECHNIQUES

Dynamic Programming - Floyd's all pairs shortest path algorithm – 0 / 1 Knapsack problem - Backtracking – 8 Queen Problem - Design

of searching algorithms-sequential search-binary search - binary tree search.

TEXT BOOKS

1. Sahni, S.,Data Structures,Algorithms and Applications in c++,Mcgraw hill,1998.
2. Weiss, M. A. ,Data Structures and Algorithm Analysis in C, 2nd ed, Pearson Education Asia, 2002.

REFERENCES

1. Dromey, R. G., How to Solve it by Computer, Prentice-Hall of India, 2002.
2. Langsam, Y., Augenstein M. J., and Tanenbaum, A. M., Data Structures using C,
3. Pearson Education Asia, 2004
4. Richard F. Gilberg, Behrouz A. Forouzan, Data Structures – A Pseudocode Approach
5. With C, Thomson Brooks / COLE, 1998.
6. Aho, J. E. Hopcroft and J. D. Ullman, Data Structures and Algorithms, Pearson education Asia, 1983

INT205	**ANALOG AND DIGITAL COMMUNICATION**	L	T	P	C
		3	1	0	4

AMPLITUDE MODULATION: TRANSMISSION AND RECEPTION

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 reception - AM receivers – TRF, Superheterodyne receivers, Double Conversion AM receivers.

FREQUENCY MODULATION: TRANSMISSION AND RECEPTION

Frequency Modulation – FM and PM waveforms, phase deviation and modulation index, frequency deviation, phase and frequency modulators and demodulators, frequency spectrum of a angle modulated waves, Bandwidth requirement, Broadcast band FM, Average power FM and PM modulators – Direct FM and PM, Direct FM transmitters, Indirect transmitters- FM receivers- FM demodulators, PLL FM demodulators, FM noise suppression

DIGITAL MODULATION TECHNIQUES

Introduction- Binary PSK- DPSK- Differentially encoded PSK- QPSK- M-ary PSK- QASK- Binary FSK- MSK- Duobinary encoding – Performance comparison of various systems of Digital Modulation-Dial up modem modulation.

BASEBAND DATA TRANSMISSION

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 Distortionless baseband binary transmission- eye pattern- baseband M-ary PAM systems- adaptive equalization for data transmission-Training sequence in cell phone.

SPREAD SPECTRUM AND MULTIPLE ACCESS TECHNIQUES

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.

TEXT BOOKS

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

REFERENCESS

1. Simon Haykin, Communication Systems, John Wiley & Sons, 4th edn.,2001.
2. Taub & Schilling, Principles of Communication Systems, TMH, 2nd edn., 2003.
3. Martin S.Roden, Analog and Digital Communication System, PHI, 3rd edn. 2002.
4. Blake, Electronic Communication Systems, Thomson Delman, 2nd edn., 2002.

INT 281	DATA STRUCTURES LABORATORY	L	T	P	C
		0	0	3	2

1. Write a program to implement a list using an array
2. Write a program to create a singly linked list
3. Develop a date structure for trees. Include addition, deletion, access procedures. Apply this to problems like students list, passengers list, polynominal representations.
4. Write an algorithm for balancing a B tree, B plus tree and tree.
5. 5. Write an algorithm to convert a tree into a binary tree. Also traverse the tree. Write a search algorithm using an ordered binary tree.
6. Write a program to check for balanced parentheses of an expression using array implementation of stack.
7. Write a program to check for balanced parentheses of an expression using linked list implementation of stack.
8. Write a program to implement a Queue using an array.
9. Write a program to implement a Queue using linked list.

10. Write a program to sort a set of elements using bubble sort, insertion sort, selection sort, Shell sort, heap sort, and quick sort
11. Write a C program to search a set of elements using linear search and binary search.
12. Write a C program to implement the Dijkstra's Algorithm
13. Write C program for the implementation of minimum spanning using Kruskal and Prims algorithm.
14. 14. Develop data structures for multilevel indexing to store records. Write procedures for insertion, deletion and accessing a record. Calculate access times. 15.Write algorithm to access records based on a non-key value (inverted list - approach).

INT 282	DIGITAL AND SYSTEM DESIGN LABORATORY	L	T	P	C
		0	0	3	2

1. Verification of Boolean theorems using digital logic gates
2. Design and implementation of combinational circuits using basic gates for arbitrary functions, code converters, etc.
3. Design and implementation of 4-bit binary adder / subtractor using basic gates and MSI devices.
4. Design and implementation of parity generator / checker using basic gates and MSI devices.
5. Design and implementation of magnitude comparator
6. Design and implementation of application using multiplexers
7. Design and implementation of Flip-flops
8. Design and implementation of Shift registers
9. Design and implementation of Synchronous and Asynchronous counters
10. Coding combinational circuits using Hardware Description Language (HDL software required)
11. Coding sequential circuits using HDL (HDL software required)

INT 283	OPERATING SYSTEM LABORATORY	L	T	P	C
		0	0	3	2

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 Is, 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 turnaround 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 for example 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.

10. Implement some memory management schemes – II for example 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 fir, worst fit and best fit.

SEMESTER IV

MAT221	MATHEMATICS IV (Common to CSE and IT)	L	T	P	C
		3	0	0	3

PROBABILITY , RANDOM VARIABLES AND STANDARD DISTRIBUTIONS

Axioms of probability - Conditional probability - Total probability - Bayes theorem - Random variable - Probability mass function - Probability density functions - Properties- Mathematical expectation - Moments - Moment generating functions and their properties - Binomial, Poisson, Geometric, Negative Binomial, Uniform, Exponential, Gamma, Weibull and Normal distributions and their properties - Functions of a random variable.

TWO DIMENSIONAL RANDOM VARIABLES

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

TESTING OF HYPOTHESIS

Sampling distributions – Testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions - Tests for independence of attributes and Goodness of fit.

DESIGN OF EXPERIMENTS

Analysis of variance – One way classification – CRD - Two – way classification – RBD - Latin square.

GRAPH THEORY

Introduction of graphs - paths, cycles, and trails - vertex degrees and counting - Directed graphs - trees and distance basic properties - Spanning trees, enumeration, optimization and trees.

TEXT BOOKS

1. Gupta, S.C, and Kapur, J.N., Fundamentals of Mathematical Statistics, Sultan Chand, New Delhi, 11th Edn., 2006.
2. Ross, S., A first Course in Probability, Pearson Education, Delhi, 5th Edn., 2002.
3. Arumugam, S., Ramachandran, S., Invitation to Graph Theory, Scitech Publications (India) Pvt. Ltd., Chennai, 1st Edn., Reprint 2006, 2001.

REFERENCES

1. Johnson. R. A., Miller & Freund's Probability and Statistics for Engineers, Prentice Hall of India, New Delhi, 7th Edn., 2005.
2. Wilson, R.J., Graph Theory, Person Edition, New Delhi, 4th Edn., Reprint 2004, 2003.

INT 206	OBJECT ORIENTED PROGRAMMING SYSTEMS	L	T	P	C
		3	1	0	4

INTRODUCTION

Object-oriented paradigm - elements of object oriented programming – Merits and demerits of OO methodology – C++ fundamentals – data types, operators and expressions, control flow, arrays, strings, pointers and functions.

PROGRAMMING IN C++

Classes and objects – constructors and destructors, operator overloading – inheritance, virtual functions and polymorphism.

FILE HANDLING

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.

JAVA INTRODUCTION

An overview of Java - data types - variables and arrays, operators, control statements, classes, objects, methods – Inheritance.

JAVA PROGRAMMING

Packages and Interfaces- Exception handling - Multithreaded programming - Strings,
Input /Output

TEXT BOOKS

1. Venugopal, R.,Rajkumar Buyya, Ravishankar, T. Mastering C++, TMH, 2003
2. Herbert Schildt, The Java 2 : Complete Reference, Fourth edition, TMH, 2002

REFERENCES

1. Ira Pohl, Object oriented programming using C++, Pearson Education Asia, 2003

INT 207	DIGITAL SIGNAL PROCESSING	L	T	P	C
		3	1	0	4

SIGNALS AND SYSTEMS

Basic elements of digital signal Processing – Concept of frequency in continuous time and discrete time signals – Sampling theorem – Discrete time signals, Discrete time systems – Analysis of Linear time invariant systems – Z transform –Convolution and correlation - Matlab programs for signals and systems.

FAST FOURIER TRANSFORMS

Introduction to DFT – Efficient computation of DFT Properties of DFT – FFT algorithms – Radix-2 and Radix-4 FFT algorithms –

Decimation in Time – Decimation in Frequency algorithms –Use of FFT algorithms in Linear Filtering and correlation.

IIR FILTER DESIGN

Structure of IIR – System Design of Discrete time IIR filter from continuous time filter – IIR filter design by Impulse Invariance. Bilinear transformation – Approximation derivatives – Design of IIR filter in the Frequency domain.

FIR FILTER DESIGN

Symmetric & Antisymteric FIR filters – Linear phase filter – Windowing technique – Rectangular, Kaiser windows – Frequency sampling techniques – Structure for FIR systems.

APPLICATION OF DSP

Finite word length effects: Quantization noise – derivation for quantization noise power – Fixed point and binary floating point number representation – comparison – over flow error – truncation error – co-efficient quantization error - limit cycle oscillation – signal scaling – analytical model of sample and hold operations – Application of DSP: Model of Speech Wave Form – Vocoder – musical sound processing,digital music synthesis.

TEXT BOOKS

1. John Proakis, G., and Dimtris Manolakis, G .,Digital Signal Processing Principles,
2. Algorithms and Application", PHI/Pearson Education, 3rd Edition, 2000.

REFERENCES

1. Alan V Oppenheim, Ronald W Schafer and John R Buck, Discrete Time Signal Processing, PHI/Pearson Education, 2nd Edition, 2000.
2. SanjitMitra, K., Digital Signal Processing: A Computer – Based Approach, Tata McGraw-Hill, 2001, Second Edition.

3. Johny Johnson, R., Introduction to Digital Signal Processing, Prentice Hall of India/Pearson Education, 2002.

INT 208	MICROPROCESSOR AND MICROCONROLLER	L	T	P	C
		3	0	0	3

8085 CPU

8085 Architecture – Instruction set – Addressing modes – Timing diagrams – Assembly language programming – Counters – Time Delays – Interrupts – Memory interfacing – Interfacing, I/O devices.

PERIPHERALS INTERFACING

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

8086 CPU

Intel 8086 Internal Architecture – 8086 Addressing modes - Instruction set - 8086 Assembly language Programming – Interrupts.

8051 MICROCONTROLLER

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.

8051 PROGRAMMING AND APPLICATIONS

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.

TEXT BOOKS

1. Ramesh Gaonkar, S., Microprocessor Architecture, Programming and application with 8085, , Penram International Publishing, New Delhi, 4th Edition ,2000.
2. John Uffenbeck, The 80x86 Family, Design, Programming and Interfacing, Third Edition. Pearson Education, 2002.

REFERENCES

1. Mohammed Ali Mazidi and Janice Gillispie Mazidi, The 8051 Microcontroller and Embedded Systems, Pearson Education Asia, New Delhi, 2003.
2. Ray, A.K. , and.Burchandi, K.M, Intel Microprocessors Architecture Programming and Interfacing, McGraw Hill International Edition, 2000
3. Kenneth Ayala, J., The 8051 Microcontroller Architecture Programming and Application, Penram International Publishers (India), New Delhi, 2nd Edition, 1996.
4. Rafi Quazzaman, M., Microprocessors Theory and Applications: Intel and Motorola prentice Hall of India, Pvt. Ltd., New Delhi, 2003.

INT 209	COMPUTER ARCHITECTURE AND ORGANIZATION	L	T	P	C
		3	0	0	3

BASIC STRUCTURE OF COMPUTERS

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

ARITHMETIC UNIT

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers – Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

BASIC PROCESSING UNIT

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control – Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

MEMORY SYSTEM

Basic concepts – Semiconductor RAMs – ROMs – Speed – size and cost – Cache memories – Performance consideration – Virtual memory – Memory management requirements – Secondary storage

I/O ORGANIZATION

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

TEXT BOOK

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, Computer Organization, McGraw-Hill, 5th Edition ,2002.

REFERENCES

1. William Stallings, Computer Organization and Architecture – Designing for Performance, Pearson Education, 6th Edition, 2003.
2. David A. Patterson and John L.Hennessy, Computer Organization and Design: The hardware / software interface, Morgan Kaufmann2nd Edition, 2002.
3. John P.Hayes, Computer Architecture and Organization, McGraw Hill, 3rd Edition 1998.

INT 284	DSP LABORATORY	L	T	P	C
		0	0	3	2

1. Generation of i/p Signals.
2. Analysis of linear system [with convolution and deconvolution operation]
3. FIR filter design using MATLAB Programming. [any one Technique]
4. IIR filter design using MATLAB Programming [any one Technique]
5. Implementation of FFT, Interpolation and decimation
6. Estimation of power spectral density using MATLAB Programming
7. Spectral analysis using MATLAB Programming
8. FIR filter design using windows in the TMS 32050processor.
9. IIR filter design using windows in the TMS 32050processor.
10. Verification of linear phase characteristics of FIR filters using TMS 32050processor.
11. Wave generation using TMS 32050processor

INT 285	MICROPROCESSOR AND MICROCONROLLER LAB	L	T	P	C
		0	0	3	2

.

1. Programming with 8085 – 8-bit / 16-bit multiplication/division using repeated addition/subtraction
2. Programming with 8085-code conversion, decimal arithmetic, bit manipulations.
3. Programming with 8085-matrix multiplication, floating point operations
4. Programming with 8086 – String manipulation, search, find and replace, copy operations, sorting. (PC Required)
5. Using BIOS/DOS calls: Keyboard control, display, file manipulation. (PC Required)

6. Using BIOS/DOS calls: Disk operations. (PC Required)
7. Interfacing with 8085/8086 – 8255, 8253
8. Interfacing with 8085/8086 – 8279,8251
9. 8051 Microcontroller based experiments – Simple assembly language programs (cross assembler required).
10. 8051 Microcontroller based experiments – Simple control applications (cross assembler required).

INT 286	OBJECT ORIENTED PROGRAMMING LAB	L	T	P	C
		0	0	3	2

1. Programs Using Functions
   - Functions with default arguments
   - Implementation of Call by Value, Call by Address and Call by Reference
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

6. Simple Java applications
   - for understanding reference to an instance of a class (object), methods
   - Handling Strings in Java
7. Simple Package creation.
   - Developing user defined packages in Java
8. Interfaces
   - Developing user-defined interfaces and implementation
   - Use of predefined interfaces
9. Threading
   - Creation of thread in Java applications
   - Multithreading
10. Exception Handling Mechanism in Java
   - Handling pre-defined exceptions
   - Handling user-defined exceptions

SEMESTER V

INT 301	VISUAL PROGRAMMING	L	T	P	C
		3	1	0	4

WINDOWS PROGRAMMING

DOS Vs Windows programming model - GUI Concepts- Overview of Windows Programming- Windows environment - a simple windows program - windows and messages - creating the window - displaying the window- message loop - the window procedure - message passing - text output- painting and repainting - introduction to GDI - device context - basic drawing - child window controls

VISUAL BASIC PROGRAMMING

Visual Basic IDE- Simple Visual Basic program using Intrinsic Controls - ActiveX Controls - working with Files - Classes and objects- Accessing databases with data control - ADO Object Model.

VISUAL C++ PROGRAMMING

Application Framework - MFC Library - Visual C++ Components - Event Handling - Mapping Modes – colors - fonts-modal and modeless dialog - windows common controls – bitmaps – menus - keyboard accelerators - rich edit control – toolbars - 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.

ACTIVEX AND OBJECT LINKING AND EMBEDDING (OLE)

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

ADVANCED CONCEPTS

Database Management with Microsoft ODBC- Structured Query Language - MFC ODBC classes- sample database applications - DAO Concepts- displaying database records in scrolling view - VC++ networking issues – Winsock – WinInet - building a web client - Internet Information Server - ISAPI serer extension - Chat application- playing multimedia files (sound and video) files.

TEXT BOOKS

1. Charles Petzold, Windows Programming, Microsoft press, 1996
2. Francesco Balena, Programming Microsoft Visual Basic 6.0, Microsoft press, Indian Reprint, 2001.
3. 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. Deitel & Deitel, T.R.Nieto, Visual Basic 6, How to program, Prentice Hall of India, 1999.
3. Chris H. Pappas & William H. Murray, The Visual C++ 6 Complete Reference, Tata McGraw Hill, 2000.

INT 302	TELECOMMUNICATION SYSTEMS AND SWITCHING TECHNIQUES	L	T	P	C
		3	1	0	4

METHODS OF COMMUNICATION

Transmission lines – Types and Characteristics - Antenna Fundamentals – Different types of antennas & their Characteristics - Radio Frequency wave propagation - Microwave –Principles, Devices (Reflex Klystron, Magnetron, TWT) - Radar - Pulsed Radar - CW Radar(Principles and Block Diagram Only) - Cellular Radio - Citizen's band Radio- Cordless Telephone- Improved Mobile

Telephone service (IMTS)- Introduction to Advanced Mobile Phone Service (AMPS)

INTRODUCTION TO SATELLITE AND FIBER OPTIC COMMUNICATIONS

Satellite orbits- Satellite communication systems – Earth stations- Applications - Surveillance, Navigation, Mobile Communication, TV Broadcast, Satellite Radio, Satellite Telephone -The Internet - Light wave communication systems – Fiber structure and function types of Fiber – Optical Transmitter & Receiver –Fiber optic Data communication systems

TELEPHONE SYSTEM AND ITS APPLICATION

Telephones – Telephone system – Facsimile - Cellular telephone system - Paging system – Integrated services Digital Networks (ISDN)

TELECOMMUNICATION NETWORKS AND DIGITAL SWITCHING TECHNIQUES

Switching system functions - stronger switching system - cross bar exchange - SPC exchange - Message switching - circuits switching - PCM Coders - Modems and relays -Time switching-space switching - STS and TST switching - digital switching system hardware - principles of switching system software organizational processing software –DSL - ADSL

SIGNALING AND TRAFFIC

Channel associated signaling - common channel signaling - SS7 – protocol – traffic -grade of service - Modelling Switching system - Blocking models and relay system networks

TEXT BOOKS

1. Louis.E.Frenzel, Communication Electronics – Principles and Application, 3rdEditions, Tata McGraw-Hill, 2002
2. Roy Blake, Wireless Communication Technology, Thomson Delmar Learning, Second Reprint 2002
3. J.E.Flood, Telecommunication switching, Traffic and networks, Pearson education ltd ,Newdelhi,2001

REFERENCES

1. Syed R Ali, Digital Switching systems,McGraw – Hill, new York 1998
2. Wayne Tomasi,Electronic Communication systems, 4th Edition, Pearson Education, 2001
3. Marin Cole, Introduction to Telecommunications –Voice, Data and Internet, Pearson Education, 2001.
4. Viswanathan T, Telecommunication switching systems and networks PHI 1994.

INT 303	DATABASE MANAGEMENT SYSTEMS	L	T	P	C
		3	0	0	3

INTRODUCTION AND CONCEPTUAL MODELING

Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

RELATIONAL MODEL

SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependences and Normalization for Relational Databases (up to BCNF).

DATA STORAGE AND QUERY PROCESSING

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.

TRANSACTION MANAGEMENT

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.

CURRENT TRENDS

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.

TEXT BOOKS

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

REFERENCES

1. Ramez Elmasri and Shamkant B. Navathe, Fundamental Database Systems, Pearson Education, Third Edition 2003.
2. Raghu Ramakrishnan, Database Management System, Tata McGraw-Hill Publishing Company, 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", Thompson Learning Course Technology- Fifth edition, 2003.

INT 304	DATA COMMUNICATION AND NETWORKING	L	T	P	C
		3	1	0	4

DATA COMMUNICATIONS

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. 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.

NETWORK, TRANSPORT AND APPLICATIONLAYER

Internet works – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers. Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services- Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

CIRCUIT SWITCHED NETWORKS

ISO-OSI Model- TCP / IP Model –SONET- Introduction –layers – frame structure– SONET multiplexing – DWDM - Fiber to the Home – Passive optical networks- Passive Photonic loop-Hybrid

Scheme -DSL – ADSL - ISDN – BISDN- CATV- Layout-Layer network-Services

ATM

Main features of ATM –ATM protocols- Addressing Signaling & Routing –Meta signaling-ATM adaptation layer for signaling– Signaling Protocols for CS1-PNNI-Header Structure – ATM Adaptation layer –Type 0-Type 1-Type2-Type 3/4 –Type 5

MANAGEMENT AND CONTROL

Fault Management- ATM Traffic & Congestion control – Network status monitoring & Configuration- Flow control –error detection-error control Internetworking with ATM-LAN- IP over ATM – Multiprotocol over ATM – Frame Relay over ATM

TEXT BOOKS

1. Behrouz. Forouzan, A .,Data communication and Networking", Tata McGraw-Hill, 2004.
2. Walrand. Varaiya, J., "High Performance Communication Network", Morgan Kauffman-Harcourt Asia Pvt. , Ltd., 2nd Edition- 2000.
3. Bates & Donald W. Gregory ,Voice & Data Communications Handbook,
4. McGrawhill, 3rd edition – 2000.

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, Harcourt Asia Pvt. Ltd., Second Edition ,20002
3. Andrew S. Tanenbaum, Computer Networks, PHI, Fourth Edition, 2003.
4. William Stallings, Data and Computer Communication, Pearson Education, Sixth Edition 2000.

INT381	COMMUNICATION SYSTEM LABORATORY	L	T	P	C
		3	0	0	3

1. Generation and detection of Amplitude Modulation
2. Generation of Frequency modulation and its detection
3. Generation and detection of PAM
4. Generation and detection of PCM
5. Generation and detection of PTM
6. Generation of ASK Modulators and demodulators
7. Generation of FSK Modulators and demodulators
8. Generation of PSK Modulators and demodulators
9. Pseudo Random Noise sequence generation with digital IC's.
10. Generation of Line Code Encoding

INT 382	DATA BASE MANAGEMENT SYSTEMS LABORATORY	L	T	P	C
		0	0	3	2

1. Usage of DDL commands
2. Usage of DML and DCL commands
3. Usage of TCL commands
4. Multiple sub-queries
5. Correlated sub-queries
6. Usage of REF and OID
7. Object creation
8. Arrays manipulation
9. BFILE management
10. Usage of explicit cursors & implicit cursors
11. Usage of functions
12. Usage of procedures
13. Exception handling
14. Usage of database triggers
15. Packages (Oracle forms)
16. Personnel management system
17. Inventory control
18. Student Information System

INT 383	VISUAL PROGRAMMING LABORATORY	L	T	P	C
		0	0	3	2

Windows SDK

1. Simple Windows programs
2. Window creation
3. Using Controls
4. Using Colors
5. Keyboard and Mouse Events

Visual Basic

Simple programs with control structures
Adding menus to forms
Creating dialog boxes with various options
MDI application
OLE Container control
Simple Programs with classes and objects
Data Access through Data Control and DAO

Visual C++

Creating applications with App wizard
Working with MFC
Creating simple SDI and MDI applications
Exception handling
Loading-Editing-Adding-Linking resources to application
Multithreading
Creating DLLs and Using them
Creating ActiveX controls and using it
OLE Socket creation and binding using Winsock

SEMESTER VI

INT 305	SYSTEM SOFTWARE	L	T	P	C
		3	0	0	3

BACKGROUND

Introduction – System Software and Machine Architecture – The Simplified Instructional Computer (SIC) – Traditional (CISC) Machines – RISC Machines.

ASSEMBLERS

Basic Assembler Functions – Machine Dependent Assembler Features – Machine Independent Assembler Features – Assembler Design Options – Implementation Examples.

LOADERS AND LINKERS

Basic Loader Functions – Machine Dependent Loader Features – Machine Independent Loader Features – Loader Design Options – Implementation Examples.

MACRO PROCESSORS

Basic Macro Processor Functions – Machine Independent Macro Processor Features – Macro Processor Design Options – Implementation Examples

COMPILERS AND INTERPRETERS

Aspects of compilation – memory allocation – compilation of expressions- compilation of control structure code optimization – interpreters –Text editors.

TEXT BOOK

1. Beck, L. System Software, An Introduction to System Programming, Addison Wesley, 1999.

REFERENCES

1. Dhamdhere, D.M., Systems Programming and Operating Systems, Tata McGraw- Hill Company, 1999.
2. Donovan, J.J.System programming, Tata McGraw Hill , 1996

INT 306	SOFTWARE ENGINEERING	L	T	P	C
		3	0	0	3

SOFTWARE PROCESS

Introduction –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.

SOFTWARE REQUIREMENTS

Functional and non - functional - 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.

DESIGN CONCEPTS AND PRINCIPLES

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.

TESTING

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.

SOFTWARE PROJECT MANAGEMENT

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.

TEXT BOOKS

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, 5th edition, 2001

REFERENCES

1. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
2. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verilog, 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
5. University Press, New Delhi, 1996.

INT 384	NETWORK LABORATORY	L	T	P	C
		0	0	3	2

1. Write a program that takes a binary file as input and performs bit stuffing and CRC Computation.
2. Develop and application for transferring files over RS232.
3. Develop a Client – Server application for chat.
4. Develop a client that contacts a given DNS Server to resolve a given host name.
5. Write a Client to download a file from a HTTP Server.
6. Study of NS2.
7. File transfer using TCP/IP
8. Remote command execution
9. windows socket programming
10. Experiments based on LAN trainer KIT.

INT 385	SYSTEM SOFTWARE LABORATORY	L	T	P	C
		0	0	3	2

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement an op code generation
3. Implement Literal table
4. Implement Text editor
5. Implement Postfix expression conversion
6. Implement passes one of a two pass assembler.
7. Implement pass two of a two pass assembler.
8. Implement a single pass assembler.
9. Implement a macro processor.
10. Implement an absolute loader.

11. Implement a relocating loader.
12. Implement a direct-linking loader.
13. Implement a simple text editor with features like insertion / deletion of a character, word, sentence.
14. Debugging the program.

INT 386	SOFTWARE ENGINEERING LAB	L	T	P	C
		0	0	3	2

Program Analysis and Project Planning. Thorough study of the problem – Identify project scope, Objectives, Infrastructure.

Software requirement Analysis Describe the individual Phases / Modules of the
project, Identify deliverables.

Data Modeling Use work products – Data dictionary, Use diagrams and activity diagrams, build and test lass diagrams, Sequence diagrams and add interface to class diagrams.
Software Development and Debugging

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

Suggested List of Applications:

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System(Railway)
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance

9. Real-Time Scheduler
10. Remote Procedure Call Implementation

SEMESTER VII

INT 401	MULTIMEDIA AND COMPUTER GRAPHICS	L	T	P	C
		3	0	0	3

MULTIMEDIA SYSTEMS DESIGN

An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases

MULTIMEDIA FILE HANDLING

Compression & Decompression – Data & File Format standards – Multimedia I/O technologies - Digital voice and audio – video image and animation – Full motion video – Storage and retrieval Technologies.

HYPERMEDIA

Multimedia Authoring & User Interface – Hypermedia messaging - Mobile Messaging – Hypermedia message component – creating Hypermedia message – Integrated multimedia message standards – Integrated Document management – Distributed Multimedia Systems.

OUTPUT PRIMITIVES

Introduction - Line - Curve and Ellipse Algorithms – Attributes – Two-Dimensional Geometric Transformations – Two-Dimensional Viewing.

THREE-DIMENSIONAL CONCEPTS

Three-Dimensional Object Representations – Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing – Color models – Animation

TEXT BOOKS

1. Prabat K Andleigh and Kiran Thakrar, Multimedia Systems and Design, PHI, 2003.
2. 2. Donald Hearn and M.Pauline Baker, Computer Graphics C Version, Pearson Education, 2003.

REFERENCES

1. Judith Jeffcoate, Multimedia in practice technology and Applications, PHI, 1998.
2. Foley, Vandam, Feiner, Huges, Computer Graphics: Principles & Practice, Pearson Education, second edition 2003.

INT 402	COMPONENT BASED TECHNOLOGY	L	T	P	C
		3	1	0	4

INTRODUCTION

Software Components – objects – fundamental properties of Component technology – modules – interfaces – callbacks – directory services – component architecture – components and middleware

JAVA BASED COMPONENT TECHNOLOGIES

Threads – Java Beans – Events and connections – properties – introspection – JAR files – reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP

CORBA COMPONENT TECHNOLOGIES

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

. NET BASED COMPONENT TECHNOLOGIES

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

COMPONENT FRAMEWORKS AND DEVELOPMENT

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

TEXT BOOK

1. Clemens Szyperski, Component Software: Beyond Object-Oriented Programming, Pearson Education publishers, 2003

REFERENCES

1. Ed Roman, Mastering Enterprise Java Beans, John Wiley & Sons Inc., 1999.
2. Mowbray,Inside CORBA, Pearson Education, 2003.
3. Freeze, Visual Basic Development Guide for COM & COM+, BPB Publication, 2001.
4. Hortsamann, Cornell, CORE JAVA Vol-II Sun Press, 2002.

INT 481	SOFTWARE COMPONENTS LAB	L	T	P	C
		0	0	3	2

1. COM COMPONENT: Development of simple com components in VB and use them in applications.
2. ENTERPRISE JAVA BEANS: Deploying EJB for simple arithmetic operator.

3. RMI: Deploying RMI for client server applications. [2 Experiments].
4. Creation of DLL Using VB And Deploy. it in Java [2 Experiments].
5. Naming Services in CORBA
6. DSI, DII IN CORBA.
7. INTER ORB IN COMMUNICATION [IIOP,IOR] Jac ORB & VIsi broker ORB
8. STUDYING J2EE SERVER.
9. SIMPLE APPLICATION USING CORBA.
10. Using Active-X controls.
11. Deploying components for handling Multimedia files.
12. Deploying components for e-Business applications.
13. Applications using COM / DCOM.
14. Components in web applications.
15. Distributed objects deployment-EJB and CORBA.
16. Sample applications.

INT 482	MULTIMEDIA AND COMPUTER GRAPHICS LAB	L	T	P	C
		0	0	3	2

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-view port mapping
4. To perform 3D Transformations such as translation, rotation and scaling.
5. To visualize projections of 3D images.
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
11. Implementing a simple Domain Name System.
12. Designing web pages using static html.
13. Designing web pages using java applet.
14. Designing web pages using real video and audio.

MAJOR ELECTIVES

INT 307	INFORMATION CODING TECHNIQUES	L	T	P	C
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INFORMATION ENTROPY FUNDAMENTALS

Uncertainty- Information and Entropy – Source coding Theorem – Huffman coding –Shannon Fano coding – Discrete Memory less channels – channel capacity – channel coding Theorem – Channel capacity Theorem.

DATA AND VOICE CODING

Differential Pulse code Modulation – Adaptive Differential Pulse Code Modulation – Adaptive sub band coding – Delta Modulation – Adaptive Delta Modulation – Coding of speech signal at low bit rates (Vocoder, LPC).

ERROR CONTROL CODING

Linear Block codes – Syndrome Decoding – Minimum distance consideration – cyclic codes – Generator Polynomial – Parity check polynomial – Encoder for cyclic codes – calculation of syndrome – Convolutional codes.

COMPRESSION TECHNIQUES

Principles – Text compression – Static Huffman Coding – Dynamic Huffman coding – Arithmetic coding – Image Compression – Graphics Interchange format – Tagged Image File Format – Digitized documents – Introduction to JPEG standards.

AUDIO AND VIDEO CODING

Linear Predictive coding – code excited LPC – Perceptual coding, MPEG audio coders – Dolby audio coders – Video compression – Principles – Introduction to H.261 & MPEG Video standards.

TEXTBOOKS

1. Simon Haykin, Communication Systems, John Wiley and Sons, 4th Edition, 2001.
2. Fred Halsall,Multimedia Communications, Applications Networks Protocols and Standards, Pearson Education, Asia 2002.

REFERENCES

1. Mark Nelson,Data Compression Book, BPB Publication 1992.
2. Watkinson J, Compression in Video and Audio, Focal Press, London, 1995.

INT 308	OBJECT ORIENTED ANALYSIS AND DESIGN	L	T	P	C
		3	0	0	3

INTRODUCTION

An Overview of Object Oriented Systems Development - Object Basics – Object Oriented Systems Development Life Cycle.

OBJECT ORIENTED METHODOLOGIES

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.

OBJECT ORIENTED ANALYSIS

Identifying use cases - Object Analysis - Classification – Identifying Object relationships - Attributes and Methods.

OBJECT ORIENTED DESIGN

Design axioms - Designing Classes – Access Layer - Object Storage - Object Interoperability.

SOFTWARE QUALITY AND USABILITY

Designing Interface Objects – Software Quality Assurance – System Usability - Measuring User Satisfaction

TEXT BOOKS

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

REFERENCE

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

INT 309	WEB TECHNOLOGY	L	T	P	C
		3	0	0	3

INTRODUCTION

History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME, IMAP- Introduction to JAVA Scripts – Object Based Scripting for the web. Structures – Functions – Arrays – Objects.

DYNAMIC HTML

Introduction – Object refers, Collectors all and Children. Dynamic style, Dynamic position, frames, navigator, Event Model – On check – On load – Onenor – Mouse rel – Form process – Event Bubblers – Filters – Transport with the Filter – Creating Images – Adding shadows – Creating Gradients – Creating Motion with Blur – Data Binding – Simple Data Binding – Moving with a record set – Sorting table data – Binding of an Image and table.

MULTIMEDIA

Audio and video speech synthesis and recognition - Electronic Commerce – E-Business Model – E- Marketing – Online Payments and Security – Web Servers – HTTP request types – System Architecture – Client Side Scripting and Server side Scripting – Accessing Web servers – IIS – Apache web server.

DATABASE- ASP – XML

Database- Relational Database model – Overview, SQL – ASP – Working of ASP – Objects – File System Objects – Session tracking and cookies – ADO – Access a Database from ASP – Server side Active-X Components – Web Resources – XML – Structure in Data – Name spaces – DTD – Vocabularies – DOM methods.

SERVLETS AND JSP

Introduction – Servlet Overview Architecture – Handling HTTP Request – Get and post request – redirecting request – multi-tier

applications – JSP – Overview – Objects – scripting – Standard Actions – Directives.

TEXT BOOK

1. Deitel & Deitel, Goldberg, Internet and World Wide Web – How to Program, Pearson Education Asia, 2001.

REFERENCES

1. Eric Ladd, Jim O' Donnel, Using HTML 4, XML and JAVA, Prentice Hall of India, QUE, 1999.
2. Aferganatel, Web Programming: Desktop Management, PHI, 2004.
3. Rajkamal, Web Technology, Tata McGraw-Hill, 2001.

INT310	NETWORK DESIGN SECURITY AND MANAGEMENT	L	T	P	C
		3	0	0	3

PRINCIPLES OF NETWORK AND DESIGN

Design objectives – Understanding the network environment - Achieving the design goals – Importance of being predictable and fundamental design principles. – Designing the campus LAN – campus network design goals – Understanding the campus network – Designing the LAN topology – Campus hierarchical design.

DESIGNING THE WAN

Designing the WAN topology – flat versus hierarchical, flat WAN topology – limitations of a flat design – hierarchical WAN topology – PVC and leased line aggregation – Issues with hierarchical design – hierarchical layers – WAN design parameters- choosing the WAN technology – design considerations for serial links – designing IP over frame relay, and ISDN design issues with IP – fundamental IP routing design – designing an IP addressing plan – categorizing IP routing protocol and RIP.

SECURITY PROBLEM AND CRYPTOGRAPHY

Security attacks – services – and mechanism – Conventional encryption model – Steganography – classical encryption techniques – simplified DES – block Cipher principles – The DES standards – Principles of Public key cryptosystems – RSA algorithm – Key management – Hellman key exchange – Authentication requirements and functions – Authentication codes Hash functions Kerberos.

NETWORK SECURITY

D-mail security – pretty good privacy – S/MIME – IP security – overview and architecture – authentication header – encapsulating security payload – combing security associations – web security requirements SSL – TLS – secure electronic transactions – intruders – higher wall design principles – trusted systems.

NETWORK MANAGEMENT

Network management – requirements and systems – Network monitoring architecture – Performance monitoring – Fault monitoring – Account monitoring – Configuration control – Security control – SNMP background and concepts – structure of management information – SNMP protocol – Basic concepts – specifications – Transport level support Groups.

TEXT BOOKS

1. Cormac Long, IP network design, Tata McGraw Hill, 2001.
2. William Stallings, Cryptography and network security – Principles and practice, Pearson education Asia, Prentice Hall, 2000.
3. William Stallings, SNMP, SNMPv2, SNMPv3 and RMON 1 and 2, Pearson education Asia, 3rd edition, 2001.

REFERENCES

1. Charles P. Pfleeger. Security in Computing, Prentice Hall, 1989.
2. Bruce Schneier, Applied Cryptography", JohnWiley & Sons Inc, 2nd edition, 2001.

3. ED Taylor, Networking Handbook, TMH, 2000.
4. Main Subramanian, Network management – Principle and practice, Pearson education Asia, 2000.

INT 311	MOBILE COMMUNICATION AND COMPUTING	L	T	P	C
		3	0	0	3

WIRELESS COMMUNICATION FUNDAMENTALS

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

TELECOMMUNICATION NETWORKS

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT-2000 – Satellite Networks - Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

WIRLESS LAN

Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – HIPERLAN – Blue Tooth**.**

MOBILE NETWORK LAYER

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics.

TRANSPORT AND APPLICATION LAYERS

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

TEXT BOOKS

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

REFERENCES

1. Kaveh Pahlavan, 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, New York, 2003.
3. Hazysztof Wesolowshi, Mobile Communication Systems, John Wiley and Sons Ltd, 2002.

INT 312	SATELLITE COMMUNICATION	L	T	P	C
		3	0	0	3

ORBITAL PARAMETERS

Orbital parameters-Orbital perturbations-Geo stationary orbits-Low Earth and Medium orbits- Frequency selection-Frequency co-ordination and regulatory services-Sun transit outages-Limits of visibility-Attitude and orientation control-Spin stabilisation techniques-Gimbal platform

LINK CALCULATIONS

Space craft configuration-Payload and supporting subsystems-Satellite uplink -down link power budget-C/No-G/T-Noise temperature-System noise-Propagation actors- Polarization calculations

ACCESS TECHNIQUES

Modulation and Mltiplexing-Voice,Data,Video,Analog and Digital transmission systems-multiple access techniques-FDMA,TDMA,T1-T2 carrier systems-SPADE-SS-TDMA-CDMA-Assignment

Methods-Spread spectrum communication-Compression-Encryption and Decryption techniques.

EARTH STATION PARAMETERS

Earth station location-propagation effects of ground-High power transmitters-Klystron Crossed field devices-Cassegrania feeds-Measurements on G/T and Eb/No.

SATELITE APPLICATIONS

INTELSAT Series-INSAT-VSAT-Remotesensing-Moble satellite service SM,GPS, INMARSAT -Satellite Navigation System- Direct to Home service(DTH)-Special services-E-mail-Video conferencing and Internet connectivity.

TEXT BOOK

1. Bruce R.Elbert,The Satelite CommunicationApplications Hand Book,Artech House Boston,1997
2. Wilbur L.Pritchard,Hendri G.Suyderhood,Robert A.Nelson, Staelite Communication Systems Engineering, IIEdition, Prentice Hall,New Jersey.1993

REFERENCES

1. Dennis Rody, Satelite Communication, Regents/Prentice Hall,Eaglewood Cliff,New Jersey,1983
2. Tri T.Ha,Digital staelite communiocation,2nd Edition,McGraw Hill,New york.1990
3. K.Feher,Digital communication satelite / Earth Station Engineering, prentice Hall Inc,New Jersey,1983

INT 313	DATA WAREHOUSING AND MINING	L	T	P	C
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DATA WAREHOUSE

Overall Architecture of Data warehouse , Access tools, Data marts. Data warehouse administration & management. Mapping the Data warehouse to a multiprocessor architecture – relational database technology, database architecture for parallel processing

METADATA
Definition, repository, management and trends.From data warehousing to Data mining

OLAP
Need guidelines, categorization, OLAP tools and internet, Patterns and models. Statistics – Data counting and probability, hypothesis testing, contingency tables, Prediction

DATA MINING MODELS
Introduction – Decision trees – nearest neighbor and clustering, selecting and using right technique, Data visualization

APPLICATIONS
Applications of Data warehousing and Data Mining in Bioinformatics, Multimedia Data Base and world Web.

TEXT BOOK
Alex Berson, Stephen J.Smith, Data warehousing , data mining & OLAP, Tata McGraw Hill Publications,2004

REFERENCE BOOK
1. Sushmita Mitra, Tinku Acharya, Data mining – Multimedia, Soft computing and Bioinformatics, John Wiley & Sons,2003.

INT 314	**OPTICAL COMMUNICATION**	L	T	P	C
		3	0	0	3

INTRODUCTION
Historical perspective-Basic concepts-Light wave system components- Ray Theory –Mode theory-Three Windows- elements of Optical communication system Geometrical fiber Modes Optics Description of Optical fibers.

OPTICAL SIGNAL DEGRADATION

All types of Dispersion - Intermodal –Intramodal- waveguide – Material dispersion - fiber Losses - Nonlinear Optical effects

OPTICAL TRANSMITTERS

Basic concepts – Light Emitting Diodes – Semiconductor Lasers- Laser Characteristics -Transmitter Design

OPTICAL RECEIVERS

Basic concepts – Common Photo detectors – Receiver Design – Receiver Noise- Receiver Sensitivity – Sensitivity degradation

WAVELENGTH DIVISION MULTIPLEXING & PHOTONIC SWITCHING

WDM System configuration – DWDM - Applications of WDM based systems – Photonic Switching Architectures – Types of Photonic Switches – Fiber Optic Communication System Design – System Requirements – Link Analysis Ultimate System capacity

TEXT BOOKS

1. Govind P., Agrawal ,Fiber-Optic Communication Systems – , John Wiley , 2002
2. Selvarajan, A., Kar, S. & Srinivas ,T.,Optical fiber Communication – Principles and Systems –TMH , 2002

REFERENCES

1. Gerd Keiser, Optical fiber communication, McGraw Hill, 3 rd Edition 2000

INT 315	BLUE TOOTH TECHNOLOGY	L	T	P	C
		3	0	0	3

BASIC CONCEPTS

Origin- blue tooth SIG - Protocol stack - Security applications and profiles – management - test and qualification technology basics - RF and IR wireless communication.

BLUETOOTH MODULE

antennas patterns - gain and losses- types of antennas- on chip antennas radio interference - FH, modulation, symbol timing, power emission and control, performance parameters - RF architecture - Blur RF - Base band - Blue tooth device address system timing - Physical links - packet structuring types and construction - channel coding and time base synchronization.

LINK CONTROLLER AND MANAGEMENT

LCP- controller states - Pico net and scattered operations - Master / slave role switching LC Architectural overview - LMC<Link set up - Quality of service - LMP version - Name represent - Test mode.

BLUETOOTH HOST

LLC and adaptation protocol L2 cap signaling – connections- Blue tooth profiles- Version 1.0-Generic profiles-serial and object exchange.

SECURITY

Encryption and security Key generation - security Modes and architecture - Low power operation and QOS management.

TEXT BOOKS

1. Jennifer Bray and Stuntman, C.F, Blue tooths Connect without cables. Pearson education 2001.

REFERENCES

2. Brent A.Miller and Bisdikian C. ,Blue tooth reveeled, Pearson Education 2001.
3. Miller, J. ,Blue tooth Demystified, Nathan Tata Mc Graw Hill 2001.

INT 316	ADVANCED DBMS	L	T	P	C
		3	0	0	3

OVERVIEW OF TRANSACTION MANAGEMENT

The ACID Properties – Transactions and Schedules – Concurrent Execution of Transactions- Lock- Based Concurrency Control – Performance of Locking- Transaction Support in SQL – Introduction to Crash Recovery Concurrency Control: 2PL, Serializability and Recoverability – Introduction to Lock Management – Lock Conversions- Dealing with Deadlocks- Specialized Locking Techniques – Concurrency control without Locking. Crash Recovery- Introduction to ARIES – The Log – Other Recovery-Related Structures – The Write- ahead Log Protocol – Check pointing – Recovering from a System Crash – Media Recovery.

PHYSICAL DATABASE DESIGN AND TUNING

Introduction to Physical Database Design – Guidelines fro Index Selection – Clustering and Indexing – Tools to assist Index Selection – Overview of Database Tuning – Choices in tuning the Conceptual Schema – Choices in Tuning Queries and Views – Impact of Concurrency – Case Study: The Internet Shop. Security and Authorization: Introduction to database Security- Access Control-Discretionary and mandatory access control – Security for Internet applications – Additional Issues related to Security.

PARALLEL AND DISTRIBUTED DATABASES:

Architecture for parallel databases – Parallel Query Evaluation-Parallelizing Individual Operations - Parallel Query Optimization – Types of Distributed Databases – distributed DBMS Architecture – Storing data in Distributed DBMS – Distributed catalog management - Distributed Query Processing- updating Distributed Data-Distributed Transactions - Distributed Concurrency Control – Distributed recovery. Deductive Databases: Introduction to recursive queries- theoretical Foundations - recursive queries with negation.

INFORMATION RETRIEVAL AND XML DATA

Databases - IR and XML – Introduction to information retrieval- Indexing for text search – Web search engines – managing text in a DBMS- a data model for XML- X Queries: Querying XML data – Efficient evaluation of XML queries.

SPATIAL DATA MANAGEMENT

Types of spatial data and queries – Application involving Spatial data- Introduction to spatial Indexes – Indexing based on space filling curves- Grid files – R- trees- issues in High dimensional indexing- Advanced Transaction processing- Data Integration – Mobile databases- Main memory databases- Multimedia databases- Geographic Information System – Temporal Databases- Biological Databases- Information Visualizations

TEXT BOOK

1. Raghu Ramakrishna, Johannes Gehrke, Database Management Systems, Tata McGraw Hill, 2003.

REFERENCE

1. Elmasri, Navathae, Fundamentals of Database Systems, Third Edition, Pearson Education, 2000.
2. Suneel galgotia , Data base systems , Galgotia publications private limited ,1998
3. Raghu Ramakrishna, Database Management Systems, WCB/McGraw Hill, 1998.

INT 403	DIGITAL IMAGE PROCESSING	L	T	P	C
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CONTINUOUS AND DISCRETE IMAGES AND SYSTEMS

Light, - Luminance - Brightness and Contrast - Eye - The Monochrome Vision Model - Image Processing Problems and Applications - Vision Camera - Digital Processing System - 2-D Sampling Theory - Aliasing, Image Quantization - Lloyd Max

Quantizer - Dither - Color Images - Linear Systems And Shift Invariance - Fourier Transform - Z-Transform - Matrix Theory Results - Block Matrices and Kronecker Products.

IMAGE TRANSFORMS

2-D orthogonal and Unitary transforms - 1-D and 2-D DFT - Cosine, Sine, Walsh, Hadamard, Haar, Slant, Karhunen-loeve, - Singular value Decomposition transforms.

IMAGE ENHANCEMENT

Point operations - contrast stretching - clipping and thresholding density slicing, Histogram equalization - modification and specification - spatial operations –Filter - spatial averaging, low pass, high pass, band pass filtering, direction smoothing, medium filtering, generalized cepstrum and homomorphic filtering, edge enhancement using 2-D IIR and FIR filters, color image enhancement.

IMAGE RESTORATION

Image observation models - sources of degradation - inverse and Wiener filtering - geometric mean filter- non linear filters - smoothing splines and interpolation - constrained least squares restoration.

IMAGE DATA COMPRESSION AND IMAGE RECONSTRUCTION FROM PROJECTIONS

Image data rates - pixel coding - predictive techniques transform coding and vector DPCM - Block truncation coding - wavelet transform coding of images - color image coding - Random transform - back projection operator - inverse random transform - back projection algorithm - fan beam and algebraic restoration techniques.

TEXT BOOK

1. Gonzalaz R. and Wintz P., Digital Image Processing, Addison Wesley, 2nd Ed, 1987

REFERENCES

1. Anil K. Jain, Fundamentals of Digital Image Processing, PHI, 1995.
2. Sid Ahmed M.A., Image Processing, McGraw Hill Inc, 1995.
3. William. K. Pratt, Digital Image Processing, Wiley Interscience, 2nd Ed, 1991.

INT 404	INFORMATION SYSTEMS DESIGN	L	T	P	C
		3	0	0	3

MANAGING THE DIGITAL FIRM

Why information systems – contemporary approaches to information systems – new role of information systems- major types of systems in organizations – systems from a functional perspective – enterprise applications – organizations and information systems – managers decision making and information systems – information systems and business strategy.

DESIGNING INFORMATION SYSTEMS

Systems as planned organizational change – business process re-engineering and process improvement – overview of systems development – alternate system – Building approaches – Understanding the business value of Information Systems - The importance of change management in information system success and failure – Managing Implementation.

DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS

Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off-the shelf software packages – Outsourcing – Comparison of different methodologies.

KNOWLEDGE MANAGEMENT, ETHICS AND SECURITY

Knowledge Management in the organization – Information and Knowledge base systems – Decision -support systems – Understanding ethical and Social issues packed to systems – Ethics in an Information society – The moral dimensions of Information Systems – System vulnerability and abuse – Creating a control environment – Ensuring System Quality.

INFORMATION ARCHITECTURE

Defining Information Architecture – why Information Architecture matters – Practicing Information Architecture in the Real world – Information Ecologies – User needs and Behavior – The anatomy of Information Architecture – Organizing Systems – Search Systems.

TEXT BOOKS

1. Lauaon Kenneth & Landon Jane,Management Information Systems: Managing the Digital firm , Eighth edition, PHI, 2004.
2. Uma G. Gupta, Management Information Systems – A Management Prespective, Galgotia publications Pvt., Ltd., 1998.
3. Louis Rosenfel and Peter Morville, Information Architecture for the World wide Web, O'Reilly Associates, 2002.

REFERENCES

1. Steven Alter, Information Systems – A Management Perspective, Pearson Education, 2001.
2. Uma Gupta, Information Systems – Success in 21st Century, Prentice Hall of India, 2000.
3. Robert G. Murdick, Joel E. Ross and James R. Claggett, Information Systems for Modern Management, PHI, 1994.

INT 405	WIRELESS APPLICATION PROTOCOL	L	T	P	C
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MOBILE INTERNET

Introduction, Mobile Data – connectivity – Key services for mobile internet – Mobile Internet access and application service provides - Content provides and Developer.

MOBILE INTERNET STANDARD

Current Web technologies for wireless application - origin and overview of WAP components of wap standard - Network Infrastructure services supporting Wap clients Design Principles Tools and software editors and emulators.

IMPLEMENTING WAP SERVICES

WML Basic and Document model - content generation - Binary WML - enhanced WML - WML script - rules of script standard libraries - user interface design guidelines.

ADVANCED WAP

Tailoring content to client - Techniques using HTTP 1.1 - WAP Push - Push Access Protocol - Push Technology - MIME media types for push messages - Proxy gateway; Data base driven WAP - ASP and WAP - Object model - Activex data objects (ADO) - End-to-End WAP services - Security domains - linking WAP and internet.

WIRELESS TELEPHONY APPLICATIONS

WTA architecture - client Framework - Server and security - Design considerations Application creation Toolbox - WTA enhancements – Technology - Bluetooth and voice XML - Telematics inter connectivity.

TEXT BOOKS

1. Sandeep Signal et al, Writing Applications for mobile internet,. Pearson Education, 2001

REFERENCES

1. A beginner's Guide: Data BulBrook Tata McGraw Hill PCL, 2001.

INT 406	OPTICAL NETWORKS	L	T	P	C
		3	0	0	3

INTRODUCTION TO OPTICAL NETWORKS

Telecommunication Networks – First Generation Optical Networks – Multiplexing Techniques – Second Generation Optical Networks – System and Network Evolution

COMPONENTS

Couplers – Isolators and circulators – Multiplexers and Filters – Optical Amplifiers – Transmitters – Detectors – Switches – Wavelength Converters

FIRST GENERATION OPTICAL NETWORKS

SONET / SDH – MAN – FDDI – ATM- Test Beds

WAVELENGTH ROUTING NETWORKS

The Optical Layer – Node Designs- Network Design and Operation – Routing and Wavelength Assignment

ACCESS NETWORKS

Today's Access Networks – Future Access Netoworks - HFC – FTTC – FTTH – Deployment considerations – Photonic Packet Switching

TEXT BOOKS

1. Rajiv Ramasamy Kumar, Sivarajan Harcourt Asia Morgan Kaufmann, N., Optical Networks- A Practical Perspective –, 2000

REFERENCE

1. Uyles D.Blake, optical Networks: 3 rd generation Transport system

INT 407	ENTERPRISE JAVA PROGRAMMING	L	T	P	C
		3	0	0	3

J2EE and J2SE

The Birth of J2EE - Databases - The Maturing of Java - Java Beans and Java Message Service - Why J2EE? J2EE Multi-Tier Architecture - J2EE Best Practices - J2EE Design Patterns and Frameworks

J2EE FOUNDATION

Java servlets - Java Server Pages

ENTERPRISE JAVABEANS

JavaMail API - Java Interface Definition Language and CORBA.

JAVA REMOTE METHOD INVOCATION

Java Message Service – Security - Java Naming and Directory Interface API

WEB SERVICES

SOAP - Universal Description, Discovery, and Integration (UDDI) - Electronic Business XML - The Java API for XML Registries (JAXR) - Web Services Description Language (WSDL)

TEXT BOOK

1. James Keogh, J2EE - The complete Reference, Mc-Graw Hill, 2002.

REFERENCE

1. Harvey M.Deital ,Paul J.Deitel ,Sean E.Santry ,Advanced JAVA platform how to program,Pearson Education ,2002.

INT 408	ENTERPRISE RESOURCE PLANNING	L	T	P	C
		3	0	0	3

INTRODUCTION

ERP: An Overview, Enterprise – An Overview, Benefits of ERP- ERP and Related Technologies- Business Process Reengineering (BPR)- Data Warehousing- Data Mining - OLAP - SCM

ERP IMPLEMENTATION

ERP Implementation Lifecycle - Implementation Methodology - Hidden Costs - Organizing the Implementation – Vendors - Consultants and Users - Contracts with Vendors - Consultants and Employees - Project Management and Monitoring

THE BUSINESS MODULES

Business modules in an ERP Package - Finance – Manufacturing - Human Resources - Plant Maintenance - Materials Management - Quality Management - Sales and Distribution

THE ERP MARKET

ERP Market Place - SAP AG - People soft – Baan - JD Edwards- Oracle – QAD - SSA

ERP – PRESENT AND FUTURE

Turbo Charge the ERP System – EIA - ERP and e-Commerce - ERP and Internet - Future Directions

TEXT BOOK

1. Alexis Leon,ERP Demystified, Tata McGraw Hill, New Delhi, 2003

REFERENCES

1. Joseph A Brady, Ellen F Monk, Bret Wagner,Concepts in Enterprise Resource
Planning, Thompson Course Technology, USA, 2001.
2. Vinod Kumar Garg and Venkitakrishnan N K, Enterprise Resource Planning –
Concepts and Practice, PHI, New Delhi, 2003

INT 409	DISTRIBUTED SYSTEMS	L	T	P	C
		3	0	0	3

INTRODUCTION

Introduction to Distributed systems-examples of distributed systems - challenges-architectural models - fundamental models - Introduction to interprocess communications-external data representation and marshalling- client server communication-group communication – Case study: IPC in UNIX

DISTRIBUTED OBJECTS AND FILE SYSTEM

Introduction - Communication between distributed objects - Remote procedure call - Events and notifications - Java RMI case Study - Introduction to DFS - File service architecture - Sun network file system - Introduction to Name Services- Name services and DNS - Directory and directory services

DISTRIBUTED OPERATING SYSTEM SUPPORT

The operating system layer – Protection - Process and threads - Communication and invocation - Operating system architecture - Introduction to time and global states - Clocks, Events and Process states - Synchronizing physical clocks - Logical time and logical

clocks - Global states - Distributed debugging – Distributed mutual exclusion.

TRANSACTION AND CONCURRENCY

CONTROL – DISTRIBUTED TRANSACTIONS

Transactions – Nested transaction – Locks - Optimistic concurrency control - Timestamp ordering - Comparison of methods for concurrency control - Introduction to distributed transactions - Flat and nested distributed transactions - Atomic commit protocols - Concurrency control in distributed transactions - Distributed deadlocks - Transaction recovery

SECURITY AND REPLICATION

Overview of security techniques - Cryptographic algorithms – Digital signatures - Cryptography pragmatics – Replication - System model and group communications – Fault tolerant services – Highly available services – Transactions with replicated data

TEXT BOOK

1. George Coulouris, Jean Dollimore, Tim Kindberg,Distributed Systems Concepts and Design,Third Edition – 2002- Pearson Education Asia.

REFERENCES

1. A.S.Tanenbaum, M.Van Steen, Distributed Systems, Pearson Education 2004
2. Mukesh Singhal, ,Advanced Concepts In Operating Systems, McGraw-Hill Series in Computer Science, Ohio State University, Columbus 1994.

INT 410	WEB SERVICES	L	T	P	C
		3	0	0	3

XML TECHNOLOGY FAMILY

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

ARCHITECTING WEB SERVICES

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

WEB SERVICES BUILDING BLOCKS

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

IMPLEMENTING XML IN E-BUSINESS

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.

XML CONTENT MANAGEMENT AND SECURITY

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

TEXT BOOK

1. Ron Schmelzer et al. XML and Web Services, Pearson Education, 2002.

REFERENCES

1. Ron Schmelzer et al. XML and Web Services, Pearson Education, 2002.
2. Keith Ballinger, . NET Web Services Architecture and Implementation, Pearson Education, 2003.
3. David Chappell,Understanding .NET A Tutorial and Analysis, Addison Wesley, 2002.
4. Kennard Scibner and Mark Costive, Understanding SOAP, SAMS publishing.
5. Alexander Nakhimovsky and Tom Myers, XML Programming: Web Applications and Web Services with JSP and ASP, Apress, 2002.

INT 411	MOBILE NETWORKS	L	T	P	C
		3	0	0	3

AD HOC NETWORKS

Characteristics and Applications of Ad hoc Networks - Routing – Need for routing and routing classifications - Table Driven Routing Protocols - Source Initiated On-Demand Routing Protocols - Hybrid Protocols – Zone Routing - Fisheye Routing - LANMAR for MANET with group mobility - Location Added Routing, Distance Routing Effects - Micro discovery and Power Aware Routing

SENSOR NETWORKS

Wireless Sensor Networks - DARPA Efforts –Classification - Fundamentals of MAC - Flat routing – Directed Diffusion-SPIN - COGUR - Hierarchical Routing - Cluster base routing - Scalable Coordination – LEACH – TEEN - APTEEN and Adapting to the dynamic nature of Wireless Sensor Networks.

WIRELESS BROADBAND NETWORKS TECHNOLOGY AND PLATFORMS

Wireless broadband fundamentals and Fixed Wireless Broadband Systems - Platforms- Enhanced Copper- Fibre Optic and HFC - 3G Cellular- Satellites - ATM and Relay Technologies.

MANAGING WIRELESS NETWORKS AND TESTING

Managing Wireless Broadband Operations Management of LMDS Systems and their Application - Principles of operations Management - LMDS Versus Other Access technologies – Applications -Testing Wireless Satellite Networks and Fixed Wireless Broadband Networks

ADVANCED WIRELESS NETWORKS

Wireless. Broadband Network Applications - Teleservices Model and Adaptive QoS Parameters - Modeling of Wireless - Broadband Applications - Multicomponent Model - Residential High speed Internet Wireless Broadband Satellite Systems - Next Generation Wireless Broadband Networks – 3G, Harmonized 3G, 3G CDMA, Smart Phones and 3G Evolution

TEXT BOOK

1. John R. Vacca, Wireless Broadband Networks Handbook 3G, LMDS and Wireless Internet, Tata McGraw-Hill, 2001

REFERENCES

2. John R. Vacca, Wireless Broadband Networks Handbook 3G, LMDS and Wireless Internet, Tata McGraw-Hill, 2001
3. Agrawal D.P., and Qing-An zeng, Introduction to Wireless and Mobile Systems Thomson Learning, 2003
4. Martyn Mallick, Mobile and Wireless Design Essentials, Wiley, 2003
5. Kavesh Pahlavan and Prashant Krishnamurty - Principles of Wireless Networks – A unified Approach, Pearson Education, 2002

INT412	THEORY OF COMPUTATION	L	T	P	C
		3	0	0	3

AUTOMATA

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.

REGULAR EXPRESSIONS AND LANGUAGES

Regular Expression – Regular Grammars– properties of regular languages-pumping Lemma and application

CONTEXT-FREE GRAMMAR AND LANGUAGES

Context-Free Grammar (CFG) – Application- Parse Trees – Ambiguity in grammars and languages – Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG, Deterministic Pushdown Automata.

PROPERTIES OF CONTEXT-FREE LANGUAGES

Normal forms for CFG – Pumping Lemma for CFL –Applications properties of CFL – Turing Machines – Programming Techniques for TM-Extensions-Restricted TM

UNDECIDABILITY

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-NP complete-complements of languages in NP

TEXT BOOK

1. J.E.Hopcroft,Motwani ,R., and Ullman, J.D., Introduction to Automata Theory, Languages and Computations, 3 Edition, 2006.

REFERENCES

1. Martin, J., Introduction to Languages and the Theory of Computation, Third Edition, TMH, 2003
2. Lewis, H.R and Papadimitriou, C.H, Elements of The theory of Computation, Second Edition, Pearson Education/PHI, 2003

MINOR ELECTIVES

CSE403	SOFT COMPUTING	L	T	P	C
		3	0	0	3

AIMS OF SOFT COMPUTING

Aims of Soft Computing-Foundations of Fuzzy Sets Theory-Basic Concepts And Properties Of Fuzzy Sets- Elements Of Fuzzy Mathematics-Fuzzy Relations-Fuzzy Logic

APPLICATION OF FUZZY SETS

Application of Fuzzy Sets-Fuzzy Modeling – Fuzzy Decision Making-Pattern Analysis And Classification-Fuzzy Control Systems-Fuzzy Information Processing-Fuzzy Robotics.

ARTIFICIAL NEURAL NETWORKS

Artificial Neural Networks-Models Of Neuron-Feed Forward Neural Networks-Recurrent Neural Networks-Time Delay Neural Networks-Radial Basis Function Neural Networks-Cerebellar Model Articulation Controller-Adaptive Resonance Theory (ART) NN-Associative Neural Memory Models-Supervised Learning Of Neural Networks -Unsupervised Learning-Reinformation Learning-Application Of ANN- Probabilistic Reasoning

GENETIC ALGORITHM

Genetic Algorithm Main Operators- Genetic Algorithm Based Optimization-Genetic Algorithm With Group Principle-Group Genetic Algorithm With Directed Mutation-Comparison Of Conventional And Genetic Search Algorithms-Applications-Elements Of Chaos System-Basic Concepts-Identification Of Chaotic Movement System-Bifurcation And Handling Of Development Of Chaos-Empirical Chaos

NEURO-FUZZY TECHNOLOGY

Fuzzy Neural Networks And Their Learning-Architecture Of Neuro-Fuzzy Systems-Generation Of Fuzzy Rules And Membership Functions - Fuzzification And Defzzyfication In Neuro-Fuzzy Systems- Neuro - Fuzzy Identification - Neuro Fuzzy Control- Neuro Fuzzy Navigation System For Intelligent Robot-Combination Of Genetic Algorithm With Neural Networks-Combination Of Genetic Algorithms And Fuzzy Logic-Neuro-Fuzzy-Genetic Approach.

TEXT BOOK

1. Aliev,R.A, Aliev,R.R., Soft Computing and its Application, World Scientific Publishing Co. Pvt. Ltd., 2001.

REFERENCE BOOKS

1. Cordón O., Herrera F., Hoffman F., Magdalena L, Genetic Fuzzy systems, World Scientific Publishing Co. Pvt. Ltd., 2001.

2. Mehrotra K., Mohan C., K., Ranka S., Elements of Artificial Neural Networks, The MIT Press, 1997.
3. Zaknih A., Neural Networks for Intelligent Signal Processing, World Scientific Publishing Pvt. Ltd., 2003.

ECE 321	DIGITAL MOS CIRCUITS	L	T	P	C
		3	1	0	3

CHARACTERISTICS OF MOS TRANSISTORS

Review of the basics physics –I-V & C-V characteristics - Short channel and narrow channel effects in MOSFETs – sub threshold conduction - channel length modulation - drain induced barrier lowering - hot carrier effects -velocity saturation of charge carriers

SCALING IN MOSFETS

Constant voltage and constant field scaling - digital MOSFET model - series connection of MOSFETs – body effect. Scaling issues in interconnects. Latch up in CMOS and methods for preventing latch up.

MOS INVERTERS

Resistive load - NMOS load - pseudo NMOS and CMOS inverters - calculation of input high and low and output high and low levels - power dissipation - calculation of delay times for CMOS inverter - CMOS ring oscillator - design of super buffer - estimation of interconnect parasitics and calculation of interconnect delay. Static CMOS logic circuits - CMOS NOR, NAND, AOI and OAI gates - full adder - SR and JK latches - C²MOS latch - Pass transistors and Transmission gates - simple circuits using TG – basic principles of pass transistor logic - voltage bootstrapping

PSEUDO NMOS

Tri-state circuits – clocked CMOS – Dynamic CMOS circuits – solutions for charge sharing - DOMINO Logic- NORA – TSPC logic styles – Dual rail logic networks – Implementation of general VLSI

system components such as decoders, encoders, Flip Flops and Registers- Method of Logical Effort for high speed CMOS design - BiCMOS logic circuits - BiCMOS inverter with resistive base pull down and active base pull down - BiCMOS switching transients - simple gates using BiCMOS – Advanced CMOS logic styles

CMOS CLOCKING STYLES

Clock generation and distribution - Arithmetic Circuits in CMOS VLSI - high speed adders, subtractors and multipliers – CMOS Memory structures – RAM and DRAM design –Sense amplifier design - Low power design techniques –MT CMOS – VTCMOS basic ideas of adiabatic logic. Floor planning and Routing – Input and Output circuits – special CMOS device structures such as SOI, DTMOS, Radiation Hard CMOS, Fin FETs.

TEXT BOOKS

1. Sung-Mo Kang & Yusuf Leblebici, CMOS Digital Integrated Circuits - Analysis & Design, 2nd Edition, McGraw Hill, 2001.
2. Jan M Rabaey, Digital Integrated Circuits - A Design Perspective, Prentice Hall, 2001.

REFERENCES

1. Yuan Taur & Tak H Ning, Fundamentals of Modern VLSI Devices, Cambridge Univ.Press, 2004.
2. Ken Martin, Digital Integrated Circuit Design, Oxford Univ. Press, 2003.

CSE307	ARTIFICIAL INTELLIGENCE	L	T	P	C
		3	0	0	3

INTRODUCTION AND INTELLIGENT AGENTS

Introduction to Artificial Intelligence: What is AI ? Intelligent Agents: Rationality – Nature of the Environments – Structure of Agents – Problem Solving Agents – Example Problems – Searching

for Solutions - Uniformed search strategies – Avoiding repeated search

SEARCHING TECHNIQUES

Informed search strategies – Heuristic Functions – Local Search Algorithms and Optimization problems : Hill Climbing, Simulated Annealing, Local Beam searches and Genetic Algorithm – Constraint Satisfaction Problems (CSP) : Backtracking – Local Search for CSPs – Adversarial Search : Games – Alpha-Beta Pruning

KNOWLEDGE REPRESENTATION AND REASONING

Logical Agents: Knowledge Based Agents – The Wumpus World – Propositional Logic - First Order Logic: Representation revisited – Syntax and Semantics – Using First Order Logic- Inference in First Order Logic: Propositional Vs FOL – Forward and Backward Chaining - Knowledge Representation: Ontological Engineering – Actions, Situations and Events

PLANNING AND LEARNING

Planning: The Planning Problem –Planning as search, partial order planning, construction and use of planning graphs – Conditional Planning - Learning: Forms of learning – Inductive Learning – Learning Decision Trees – Ensemble Learning – Statistical Learning Methods

COMMUNICATION, PERCEPTION AND ACTION

Communication: Communication as action – A Formal Grammar for a Fragment of English – Syntactic Analysis – Augmented Grammars – Semantic Representation – Ambiguity and Disambiguation – Perception: Introduction – Image formation – Extracting Three-Dimensional Information – Object Recognition – Robotics: Hardware – Perception – Planning – Moving – Software Architectures

TEXT BOOK

1. Stuart Russell, Peter Norvig, Artificial Intelligence – A Modern Approach, Pearson Education / Prentice Hall of India , 2nd Edition, 2005

REFERENCES

1. Nils J. Nilsson, Artificial Intelligence: A new Synthesis, Harcourt Asia Pvt. Ltd., 2000.
2. Elaine Rich and Kevin Knight, Artificial Intelligence, Tata McGraw-Hill, 2nd Edition, 2003
3. George F. Luger, Artificial Intelligence-Structures And Strategies For Complex Problem Solving, Pearson Education / PHI, 2002

EIE 365	MEDICAL ELECTRONICS	L	T	P	C
		3	0	0	3

BIO-ELECTRIC CONCEPTS

Cell and its Structure -Origin of resting and action potential – Bioelectric Potentials – Electrode Theory – Types of pre amplifiers - Isolation amplifier - Differential amplifier - Instrumentation amplifier - bridge amplifier - chopper amplifier

PHYSIOLOGY

Electro Physiology of Heart – ECG – Physiology of Central Nervous System – EEG – Evoked Potential – Physiology of Eye – ERG – EMG, Analysis of ECG and EEG – Patient monitoring system.

HEART-LUNG MACHINE

Kidney Machine – Nerve Stimulators –Short wave Diathermy - Microwave Diathermy - Ultrasonic diathermy - Surgical diathermy - anesthetic monitor

MEDICAL IMAGING

Ultrasonic imaging – Radiology- X-rays in tissue- Nuclear medicine, tracing techniques, gamma camera - Nuclear magnetic imaging- Magnetic Resonance Imaging - Smoothing medical images - Positron Emission Tomography

MEASURING DEVICES

Measurement of Blood flow – Lung Volume – Cardiac output – Oxygen Saturation of Blood – Blood Cell Counters – Flame photometer.

TEXTBOOK

1. Joseph J. Carr and John M. Brown, Introduction to Biomedical Equipment Technology, Pearson Education, 2001.

REFERENCES

1. Myer Kutz, Standard Handbook of Biomedical Engineering & Design, McGraw-Hill,6th edition, 2000.
2. John G. Webstar, Medical Instrumentation Application and Design, John Wiley & Sons, 1999.
3. Khandpur R.S.,Hand book of Biomedical Instrumentation", TMH, 2000.

CSE 365	ADVANCED COMPUTER ARCHITECTURE	L	T	P	C
		3	0	0	3

FUNDAMENTALS OF COMPUTER DESIGN

Review of fundamentals of CPU, Memory and IO – Performance evaluation – Instruction set principles – Design issues – Example Architectures.

INSTRUCTION LEVEL PARALLELISM

Pipelining and handling hazards – Dynamic Scheduling – Dynamic hardware prediction – Multiple issue – Hardware based speculation – Limitations of ILP – Case studies.

INSTRUCTION LEVEL PARALLELISM

Compiler techniques for exposing ILP – Static branch prediction – VLIW & EPIC – Advanced compiler support – Hardware support for exposing parallelism - Hardware versus software speculation mechanisms – IA 64 and ltanium processor.

MEMORY AND I/O

Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time – Main memory and performance – Memory technology. Types of storage devices – Buses – RAID – Reliability, availability and dependability – I/O performance measures – Designing an I/O system.

MULTIPROCESSORS AND PARALLELISM

Symmetric and distributed shared memory architectures – Performance issues – Synchronization – Models of memory consistency – Multithreading.

TEXT BOOK

1. John L.Hennessey and David A.Patterson, Computer Architecture: A Quantitative Approach, Morgan Kaufmann, 3rd Edition, 2003.

REFERENCE

1. D.Sia, et. al, Advanced computer Architectures: A Design Space Approach, Addison Wesley, 2000.

CSE408	GRID COMPUTING	L	T	P	C
		3	0	0	3

COMPUTING TECHNOLOGY

Cluster Computing – Peer to Peer Computing – Grid Computing – Grid Protocols – Types of Grids – Desktop Grids

TYPES OF GRIDS

Cluster Grids – Data Grids – Data Grid Architecture – Open Grid Services Architecture – Implementing OGSA based Grids

GRID SERVICES

Creating and Managing Grid Services – Service discovery – Operational requirements – Tools and Toolkits – Grid Enabling software applications

GRID MANAGEMENT

Managing Grid Environments – Managing Grids – Management reporting – Monitoring – Service level Monitoring – Data catalogs and Replica management – Portals – Grid Enabling Network Services

RESOURCE MANAGEMENT IN GRID

Resource and Service Management – Resource Management on the Grid – Requirement – Resource Management Framework – Grid Resource Management System – Service negotiation and acquisition protocols – Building reliable Clients and Services – Layers of Grid Computing

TEXT BOOK

1. Ahmar Abbas, Grid Computing: A Practical Guide to technology and Applications, Charles River media, 2003

REFERENCES

1. Joshy Joseph and Craig Fellenstein, Grid Computing, PHI, PTR-2003
2. Ian Foster, Carl Kesselman, The Grid: Blueprint for a New Computing Infrastructure, Morgan Kaufmann, 2nd Edition, 2004
3. Daniel Minoli, A Networking Approach to Grid Computing, Wiley-Inter science, 2004.

CSE313	NATURAL LANGUAGE PROCESSING	L	T	P	C
		3	0	0	3

INTRODUCTION

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

SYNTAX

Constituency – Context-Free rules and trees – Sentence-level constructions – The noun phrase – Coordination – Agreement – The 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 – A basic Top-Down parser – Problems with the basic Top-Down parser – The early algorithm – Finite-State parsing methods

SEMANTIC

Syntax-Driven semantic analysis – Attachments for a fragment of English – Integrating semantic analysis into the early parser – Idioms and compositionality – Robust semantic analysis. Lexical semantics: relational among lexemes and their senses – WordNet: A database of lexical relations – The Internal structure of words – Creativity and the lexicon.

NATURAL LANGUAGE GENERATION

Introduction to language generation – Architecture for generation – Surface realization – Discourse planning – Other issues

MACHINE TRANSLATION

Language similarities and differences – The transfer metaphor – The interlingua idea: Using meaning – Direct translation – Using statistical techniques – Usability and system development.

TEXT BOOK

1. Daniel Jurafsky and James Martin H., Speech and Language Processing, Pearson Education, Singapore Pvt. Ltd., 2003.

REFERENCS

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

CSE412	PERVASIVE COMPUTING	L	T	P	C
		3	0	0	3

INTRODUCTION

Introductory concepts, Pervasive Computing, market, m-Business Application examples, devices and interfaces, human machine interfaces, Biometrics, operating systems issues, Java in Pervasive Computing,

DEVICE TECHNOLOGY

Device Technology, Connectivity Issues and Protocols, Management Issues and Mechanisms, Web-based Applications, Protocols, Trans coding, Authentication of Clients over Web,

PERVASIVE DEVICES

WAP, WML, Voice Standards, Speech Applications and Security, PDA

WEB APPLICAION

Operating Systems, Software Components, Standards, Applications, Emerging Trends, Pervasive Web Application Architectures-Issues and Choices

ACCESS TECHNOLOGIES (WAP, PDA, VOICE)

User Interface, Implementation of User Interface - Architectures, Smart Card-based Authentication Mechanisms over the Internet, Applications, and Wearable Computing Architectures.

TEXT BOOK

1. Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaec & Klaus Rindtorff Pervasive Computing: Technology and Architecture of Mobile Internet Applications, Addison Wesley, Reading, 2002.

REFERENCS

1. Uwe Hansman, Lothar Merk, Martin S. Nicklous & Thomas Stober, Principles of Mobile Computing, Springer-Verlag, New Delhi, Second Edition, , 2003.
2. Rahul Banerjee, Internetworking Technologies: An Engineering Perspective, Prentice-Hall of India, New Delhi, 2003.
3. Yi-Bing Lin & Imrich Chlamtac, Wireless and Mobile Network Architectures, John Wiley and Sons, New Delhi, 2004.

HUMANITIES ELECTIVIES

HSS001	TOTAL QUALITY MANAGEMENT	L	T	P	C
		3	0	0	3

INTRODUCTION TO QUALITY MANAGEMENT

Definitions – TOM framework, benefits, awareness and obstacles - Quality – vision, mission and policy statements - Customer Focus – customer perception of quality, Translating needs into requirements, customer retention. Dimensions of product and service quality. Cost of quality.

PRINCIPLES AND PHILOSOPHIES OF QUALITY MANAGEMENT

Overview of the contributions of Deming, Juran Crosby, Masaaki Imai, Feigenbaum, Ishikawa, Taguchi, Shingeo and Walter Shewhart - Concepts of Quality circle, Japanese 5S principles and 8D methodology.

STATISTICAL PROCESS CONTROL AND PROCESS CAPABILITY

Meaning and significance of statistical process control (SPC) – construction of control charts for variables and attributed - Process capability – meaning, significance and measurement – Six sigma concepts of process capability - Reliability concepts – definitions, reliability in series and parallel, product life characteristics curve - Business process re-engineering (BPR) – principles, applications, reengineering process, benefits and limitations.

TOOLS AND TECHNIQUES FOR QUALITY MANAGEMENT

Quality functions development (QFD) – Benefits, Voice of customer, information organization, House of quality (HOQ), building a HOQ,

QFD process. Failure mode effect analysis (FMEA) – requirements of reliability, failure rate, FMEA stages, design, process and documentation.

TAGUCHI TECHNIQUES

Taguchi techniques – introduction, loss function, parameter and tolerance design, signal to noise ratio - Seven old (statistical) tools - Seven new management tools - Bench marking and POKA YOKE.

REFERENCES

1. Dale H.Besterfield et al, Total Quality Management, Perarson
2. Education, Thrid edition, (First Indian Reprints 2004).
3. Shridhara Bhat K, Total Quality Management – Text and Cases, Himalaya Publishing House, First Edition, 2002.
4. William J.Kolarii, Creating quality, Mcgraw Hill, 1995
5. Poornima M.Charantimath., Total quality management, Pearson Education, First Indian Reprint, 2003.

HSS002	ENGINEERING MANAGEMENT	L	T	P	C
		3	0	0	3

INTRODUCTION

Demand and Revenue Analysis - Demand Forecasting - Production Analysis - Cost and Supply Analysis, Price and output Determination - Investment Analysis - Plant Location - Economic Optimization.

FORMS OF BUSINESS AND FUNCTIONS

Types of Business Organisation, Forms - Planning - Organizing - Designing effective organisations - Coordination

HUMAN RESOURCE DEVELOPMENT

Motivating individuals and workgroups - Leadership for Managerial Effectiveness - Team working and Creativity - Managerial Communication - Personal Management – Time Management - Stores Management - Career Planning.

FINANCIAL MANAGEMENT

Product development - Management techniques in product development - Nature of controlling - Operations Management - Just-in-Time.

GLOBAL ENVIRONMENT

Managing World Economic Change - The global environment - Multinational Strategies - Economic Cycles and Director Investment - Change and Organisation Development - Managerial Ethics and Social responsibilities.

REFERENCES

1. Harold Koontz& Heinz Weihrich, Essentials of Management, Tata McGraw Hill publishing company Ltd.
2. Koontz, Weihrich& Aryasri, Principles of Management, Tata McGraw Hill publishing company Ltd.
3. Tripathi& Reddy, Principles of Management, Tata McGraw Hill publishing company Ltd.
4. Hampton, Management, Tata McGraw Hill publishing company Ltd.
5. L.M.Prasad, Principles of Management.

HSS003	**INDIAN ECONOMIC DEVELOPMENT**	L	T	P	C
		3	0	0	3

INDIAN ECONOMIC SCENARIO

Indian economy before and after Independence - National income trends and compositions. Sources of capital formation and savings - Sectoral growth. Demographic trends in India and its effect on economic development - Occupational structure of the labour force.

ECONOMIC PLANNING AND POLICY

Indian Economic Planning, fiscal policy, Monetary Policy, Unemployment in India and other economic policies

INDUSTRIAL DEVELOPMENT

Industry: Industrial development during the planning period - Industrial policies Industrial licensing policy – MRTP Act, FERA and FEMA - Growth and problems of small-scale industries - Role of Public sector enterprises in India's industrialization. Impact of economic reforms on Indian industrial sector after 1991.

FOREIGN TRADE

External Sector - Role of foreign trade. Trends in exports and imports - Composition and direction of India's foreign trade - Balance of payments crisis and the New Economic Reforms – Export promotion measures and the new trade policies - Foreign capital – FDI, aid: Multinational corporations in India

ISSUES

Important Areas of Concern - Poverty and inequality. Unemployment. Rising prices. Industrial relations. Industrial structure and causes of industrial backwardness.

REFERENCES

1. Agrawal, A.N. Indian Economy. Problems of Developmental Planning, Wiley Eastern Ltd., Calcutta, latest edition.
2. Ahluwalia, I.J. and I.M.D. Little (eds.), India's Economic Reforms and Development, Essays in honour of Manmohan Singh, Oxford University Press, New Delhi, 1999.
3. Alam, K., Agricultural Development in North East India: Constraints and Prospects, Deep & Deep Publications, New Delhi, 1993.
4. Choudhuri, Pramit. Aspects of Indian Economic Development, Lord George Allen & Unwin Ltd., London, 1975.
5. Dutt, R.C., The Economic History of India Under Early British Rule, Low Price Publications, Delhi, 1950.
6. Dutt, Ruddar and K.P.M. Sundaram, Indian Economy, S. Chand & Co. Ltd., New Delhi, 2001.

HSS006	PROFESSIONAL ETHICS	L	T	P	C
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ENGINEERING ETHICS

Functions of Being a Manager – Stock holder and stakeholder management - Ethical treatment of employees - ethical treatment of customers- supply chain management and other issues.

ENGINEERING AS SOCIAL EXPERIMENTATION

Senses of Ethics – Variety of moral issues – Types of inquiry – Moral dilemmas - Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional ideals and virtues – Theories about right action – Self-interest – Customs and religion – Use of Ethical Theories.

ENGINEER RESPONSIBILTY FOR SAFETY

Corporate social responsibility - Collegiality and loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Discrimination.

RESPONSIBILITY AND RIGHTS

Moral imagination, stake holder theory and systems thinking - One approach to management Decision – making Leadership.

GLOBAL ISSUES

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Sample code of conduct.

REFERENCES

1. Mike Martin and Roland Schinzinger, Ethics in Engineering, McGraw Hill, New York, 1996.

2. Charles D Fledderman, Engineering Ethics, Prentice Hall, New Mexico, 1999.
3. Laura Schlesinger, How Could You Do That: The Abdication of Character, Courage, and Conscience, Harper Collins, New York, 1996.
4. Stephen Carter, Integrity, Basic Books, New York, 1996.
5. Tom Rusk, The Power of Ethical Persuasion: From Conflict to Partnership at Work and in Private Life, Viking, New York, 1993.

HSS007	OPERATIONS MANAGEMENT	L	T	P	C
		3	0	0	3

INTRODUCTION TO PRODUCTION AND OPERATION MANAGEMENT

Production and Operations Management (POM) – Need, History, System, Types, functions and communication in POM.

MATERIAL AND INVENTORY MANAGEMENT

Material Management (MM) – Handling Technology (Robots, Automated storage and retrieval systems (ASRS) and methods (JIT, / Kanban, ABC Systems) - Independent Demand Inventory Models – Fixed order system, Basic EOQ, EBQ Models, Quantity discount models - Dependent Demand Inventory models – MRP and MRP II systems Introduction to ERP, e-business and e-operations strategies.

PLANNING AND FORECASTING

Introduction to Strategic, Tactical, Operational, Aggregate and Capacity Planning - Planning Product design and development – Applications of CAD, CAM, Computer Integrated Manufacturing

FORECASTING AND SCHEDULING:

Forecasting – Types, Methods (Qualitative and Quantitative), Types of variation in data, Minimizing forecasting errors and selection of forecasting methods. Johnson's Algorithm for job sequencing (n job thro' 2 machines, n jobs thro' 3 machines, n jobs thro' m machines

and 2 jobs thro' m machines) Use of Gantt charts, Queuing analysis and Critical Ratios as methods for job scheduling.

FACILITY, LAYOUT LOCATION AND WORK MEASUREMENT

Facility Location Decisions (FLcD) – Facility Layout Decision (FlyD) – Types (Fixed Position, and Production, Process, Flexible), Methodologies (Distance Minimising, Computer software systems (CRAFT, CORELAP, ALDEP), Line Balancing and performance ratios, work measurement methods (WM) - Time study, methods-time measurement,

REFERENCES

1. R.Paneer Selvam, Production and Operations Management, Prentice Hall of India, 2002.
2. Sang M Lee and Marc J Schniederjans, Operation Management, All India Publishers and Distributors, First Indian edition, 1997.
3. Robert H. Lowson, Strategic operations Management (The new competitive advantage), Vikas Publishing House, First Indian reprint, 2003.

HSS008	BASICS OF ECONOMICS	L	T	P	C
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DEFINITION AND SCOPE OF ECONOMICS

Definitions by A. Smith, A. Marshal and L. Robbins, P.Samuelson and their critical examination - Nature and scope of Economics - Micro-economics in relation to other branches of Economics.

LAW OF DEMAND

Elasticity of demand - price, income and cross, concepts and measurement - Marshallian theory of consumers' behaviour and its critical examination - Indifference curve analysis - Price, income and substitution effects - Giffen goods- Engel curve.

MARKET STRUCTURE

Definition of market. Concepts of product and factor markets. Different types of market: perfect competition, monopoly, imperfect competition, monopolistic, competition and oligopoly. Demand and Supply schedules. Price determination under perfect competition in long and short run. Price determination under monopoly. Discriminating monopoly.

MACRO-ECONOMICS

Meaning, Macro-economic Policy and Its Objectives and Instruments - National Income and Social Accounting - Concepts, components, and measurement - Basic circular flow of income model, Unemployment, trade cycle, Inflation - causes, types, effects and control.

COMMERCIAL AND CENTRAL BANKS

Credit creation, monetary policy and tools - Balance of payments - Items in the balance of payments account, equilibrium in the balance of payments.

REFERENCES

1. Ackley, G., Macroeconomics: Theory and Policy, Macmillan Publishing Company, New York, 1978.
2. Gupta, S.B., Monetary Economics, S. Chand & Co., New Delhi, 1994.
3. Ruddar Datt and K.P.M.Sundharam, Indian Economy, S.Chand & Company Ltd., New Delhi, 2003.
4. Kindleberger, C.P., R.D. Irwin, International Economics, Home Wood, 1973.
5. Lewis, M.K. and P.D. Mizan, Monetary Economics, Oxford University Press, New Delhi, 2000.
6. Ahuja H.L., Economic Environment of Business, Macroeconomic analysis, S.Chand & Company Ltd., New Delhi, 2005.
7. Gupta, G.S. Macroeconomics, Theory and Applications, Tata McGraw-Hill publishing company Ltd., New Delhi, 2001.

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HSS011	INFORMATION SYSTEMS FOR MANAGERIAL DECISION MAKING	L	T	P	C
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INTRODUCTION

Information system – establishing the framework – business model – information system architecture – evolution of information systems.

INFORMATION SYSTEM

Functional areas, Finance, marketing, production, personnel – levels, Concepts of DSS, EIS, ES – comparison, concepts and knowledge representation – managing international information system.

SYSTEM DEVELOPMENT

Modern information system – system development life cycle – structured methodologies – designing computer based method, procedures control, designing structured programs.

IMPLEMENTATION AND CONTROL

Testing security – coding techniques – detection of error – validation – cost benefits analysis – assessing the value and risk information systems.

SOFTWARE ENGINEERING

Software engineering qualities – design, production, service, software specification, software metrics, and software quality assurance – software life cycle models – verification and validation.

REFERENCES

1. Kenneth C. Laudon and Jane Price Laudon, Management Information systems Managing the digital firm, Pearson Education, Asia.

2. Gordon B.Davis, Management Information system: Conceptual Foundations, Structure and Development, McGraw Hill, 1974.
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4. Steven Alter, Information system – A Management Perspective, AddisonWesley, 1999.
5. James AN O' Brein, Management Information Systems, Tata McGraw Hill, New Delhi, 1999.
6. Turban Mc Lean, Wetherbe, Information Technology Management making connection for strategic advantage, John Wiley, 1999.
7. Ralph M.Stair and George W.Reynolds, Principles of Information Systems – A Managerial Approach Learning, 2001.

HSS012	ADVERTISING AND MEDIA SERVICES	L	T	P	C
		3	0	0	3

INTRODUCTION

Advertising management – advertiser – facilitating institutions – perspectives on advertising

ADVERTISING PROCESS

Advertising planning and decision-making – situation analysis – marketing program – segmentation strategies – social and legal factors Advertising objectives – image and competitive position – Attitude and market structure – behavioural objectives Communications – persuasion and market processes

BUDGET & MEDIA PLANNING

Budget decision - copy decisions – copy testing

Media decisions – media planning, Economic, social and legal constraints - Media Research

MEASURING EFFECTIVENESS

Ad testing validity and reliability of ads – measuring impact of advertisements

OTHER COMMUNICATION TECHNIQUES

Sales Promotion – personal Selling – Product Management

REFERENCES

1. Kenneth Clow. Donald Baack, "Integrated Advertisements, Promotion and Marketing communication", Prentice Hall of India, New Delhi, 2003.
2. S.H.H.Kazmi, Satish K Batra, "Advertising & Sales Promotion", Excel Books, New Delhi, 2001.
3. George E Belch, Michel A Belch, "Advertising & Promotion", McGraw Hill, Singapore, 1998.

HSS014	MARKETING MANAGEMENT	L	T	P	C
		3	0	0	3

MARKETING

Meaning - concept - functions - marketing Planning & implementation marketing Programmes - Marketing environment – Market Segmentation and consumer behaviour – Influencing factors, Decision process – Marketing mix – Marketing department.

PRODUCT

Meaning - Product planning - policies - positioning - New product development Product life cycle – BCG Matrix-branding. Packing, labeling.

PRICING

Pricing objectives – Setting and modifying the price – Different pricing method Product line pricing and new product pricing

DISTRIBUTION

Nature of Marketing channels - Types of Channel flows - Channel functions - Channel co-operation, conflict and competition - Direct Marketing Telemarketing, Internet shopping.

PROMOTION

Promotion Mix - Advertisement - Message - copy writing - Advertisement
budgeting - Measuring advertisement effectiveness - Media strategy - sales promotion -
Personal selling, publicity and direct marketing

REFERENCES

1. Philip Kotler, Marketing Management- Analysis Planning and Control, Prentice Hall of India, New Delhi.
2. Cundiff, Still & Govoni, Fundamentals of Modern Marketing, Prentice Hall of India, New Delhi.
3. Ramaswamy. V S & Namakumari. S, Marketing Management- Planning Implementation and Control, Macmillan Business Books, 2002.
4. Jobber, Principles and Practice of Marketing, McGraw-Hill.

		L	T	P	C
HSS015	**MANAGEMENT CONCEPTS AND TECHNIQUES**	3	0	0	3

DEVELOPMENT OF MANAGEMENT THOUGHT

Scientific Management Movement, Administrative Movement, Human- Relations Movement, Decision-Science Movement, Behavioral Movement, Systems Movement, Contingency Movement

ESSENTIALS OF PLANNING

Objectives, goals, Programmed Decisions and Un programmed Decisions; Decision-Making, Creativity in Decision-Making, Forecasting and Strategy to Formulation.

EFFECTIVE ORGANIZING
Span of Control, Departmentation, Authority; Responsibility, Bureaucracy and Adhocracy; Group Dynamics

REALITIES OF ORGANIZATIONAL LIFE
Organizational Politics, Organizational Power, Organizational Conflict

COMMUNICATION & CONTROL
Communication Process Evaluation, Control Process, Qualities of a Good Control System, Management Audit, Human – Offset Accounting, Cost Benefit Analysis.

REFERENCES

1. Harold Koontz & Heinz Weihrich, Essentials of Management, Tata McGraw Hill publishing company Ltd.
2. Koontz, Weihrich & Aryasri, Principles of Management, Tata McGraw Hill publishing company Ltd.
3. Tripathi & Reddy, Principles of Management, Tata McGraw Hill publishing company Ltd.
4. Hampton, Management, Tata McGraw Hill publishing company Ltd

HSS016	ORGANIZATIONAL PSYCHOLOGY	L	T	P	C
		3	0	0	3

FOCUS AND PURPOSE
Definition, need and importance of organizational Behaviour – nature and scope – frame work.

INDIVIDUAL BEHAVIOUR
Personality – types – factors influencing personality – theories – learning – types of learners – learning theories – organizational Behaviour modification. Attitudes – characteristics – components –

formation – measurement. Perceptions – importance – factors influencing perception – interpersonal perception.

GROUP BEHAVIOUR

Organization structure – formation – groups in organizations – influence – group dynamics – emergence of informal leaders and working norms – group decision making techniques – interpersonal relations – communication – control.

POWER

Leadership styles – theories – leaders Vs managers – sources of power – power centers – power and politics.

DYNAMICS OF ORGANIZATIONAL BEHAVIOURS

Organizational climate – factors affecting organizational climate – importance. Job satisfaction – determinants – measurements – influence on behavior. Organizational change – importance – stability Vs change – proactive Vs reaction change – the change process – resistance to change – managing change. Organizational development – characteristics – objectives – team building. Organizational effectiveness – perspective – effectiveness Vs efficiency – approaches – the time dimension – achieving organizational effectiveness.

REFERENCES

1. Stephen P.Robins, Organisational Behavior, Prentice Hall of India, 9th edition, 2001.
2. Hellriegel, Slocum and Woodman, Organisational Behavior, South-Western, Thomson Learning, 9th edition, 2001.
3. Schermerhorn, hunt and Osborn, Organisational behavior, John Wiley, 7th edition, 2001.
4. Jit S.Chand, Organisational Behavior, Vikas publishing House Pvt. Ltd. 2nd edition, 2001.
5. Fred Luthans, Organisational Behavior, McGraw Hill Book Co., 1998.

6. New Strom & Davis, Organisational behaviour, McGraw Hill, 2001.
7. Jaffa Harris and Sandra Hartman, Organisational Behaviour, Jaico, 2002.

HSS017	INTERNATIONAL ECONOMICS	L	T	P	C
		3	0	0	3

INTRODUCTION

The Traditional Theory of International Trade, The Basic Trade Model, Heckscher-Ohlin-Samuelson Model, Effects of Tariffs & Quotas, Theory of Factor Movements - New Theories of International Trade and Industrial Policies.

EXCHANGE RATE & BALANCE OF PAYMENT

The Balance of Payments and National Accounts, Determinants of Exchange Rates The Exchange-Rate Regime Choice and a Common Currency Area, International Debt and Currency Crises.

INTERNATIONAL REGULATORY AUTHORITY

Political Economy of Trade Disputes, the FTA and the WTO - The role of the IMF and other International Financial Organizations.
Reasons for Protection World Trade, International Movements of Capital - The Balance of Trade and Other Measures of International Transactions. Export and import policies.

INTERNATIONAL MACROECONOMICS

European Monetary Unification and the Euro - Preferential Trading Arrangements and the NAFTA International Policies for Economic Development, Trade Outsourcing and Off shoring

REFERENCES

1. N. Bhagwati, A. Panagariya and T. N. Srinivasan, Lectures on International Trade, MIT Press, 2nd edition, 1998.
2. M. Obstfeld and K. Rogoff, Foundation of International Macroeconomics, McGraw-Hill, 1996.

3. Romer, D., Advanced Macroeconomics, McGraw Hill, 1996.

HSS018	COMMUNICATION SKILLS	L	T	P	C
		3	0	0	3

COMMUNICATION IN BUSINESS

Systems approach, forms of business communication, management and communication, factors facilitating communication.

COMMUNICATION PROCESS

Interpersonal perception, selective attention, feedback, variables, listening barriers to listening, persuasion, attending and conducting interviews, participating in discussions, debates and conferences, presentation skills, paralinguistic features, oral fluency development.

BUSINESS CORRESPONDENCE

Business letter. Memos, minutes, agendas, enquiries, orders, sales letters, notice, tenders, letters of application, letter of complaints.

TECHNICAL REPORTS

Format, Choice of vocabulary, coherence and cohesion, paragraph writing, organization.

PROJECT REPORTS

Project proposal, project reports, and appraisal reports.

REFERENCES

1. Sharan J.Genrson and Steven M.Gerson, Technical Writing - Process and Product, Pearson Education, 2000.
2. Raymond V.Lesikar, John D. Pettit and Mary E.Flatley, Lesikass Basic Communication, Tata McGraw Will, 8th Edition, 1999.
3. Stevel. E. Pauley, Daniel G.Riordan, Technical Report Writing Today, AITBS Publishing & Distributors, India 5th edition, 2000.

4. Robert L.Shurter, Effective letters in business, Third Ed., 1983.
5. McGraith, Basic Managerial Skills for all Prentice Hall of India, 6th Edition, 2002.
6. Halliday, M.A.Ky R.Hasan, Cohesion in English, Longman, London, 1976.

HSS019	OPERATIONS RESEARCH	L	T	P	C
		3	0	0	3

INTRODUCTION TO LINEAR PROGRAMMING

Introduction to applications of operations research in functional areas of management - Linear Programming - formulation, solution by graphical and simplex methods (Primal - Penalty, Two Phase), Special cases - Dual simplex method.

TRANSPORTATION MODELS AND ASSIGNMENT MODELS

Transportation Models (Minimising and Maximising Cases) – Balanced and unbalanced cases – Initial Basic feasible solution by N-W Corner Rule, Least cost and Vogel's approximation methods - Check for optimality - Solution by MODI / Stepping Stone method - Cases of degeneracy - Transshipment Models - Assignment Models (Minimising and Maximising Cases) – Balanced and Unbalanced Cases - Solution by Hungarian and Branch and Bound Algorithms - Travelling Salesman problem - Crew Assignment Models.

INTEGER LINEAR PROGRAMMING AND GAME THEORY

Solution to pure and mixed integer programming problem by Branch and Bound and cutting plane algorithms - Game Theory - Two person Zero sum games - Saddle point, Dominance Rule, graphical and LP solutions.

REPLACEMENT MODELS AND DECISION THEORY

Replacement Models-Individuals replacement Models (With and without time value of money) – Group Replacement Models - Decision making under risk – Decision trees – Decision making under uncertainty.

PROJECT MANAGEMENT METHOD AND SIMULATION

PERT / CPM – Drawing the network, computation of processing time, floats and critical path. Resource leveling techniques - Application of simulation techniques for decision making.

REFERENCES

1. Kalavathy S, Operations Research, Vikas Publishing House, Second Edition, third Reprint 2004.
2. Paneerselvam R., Operations Research, Prentice Hall of India, Fourth Print, August 2003.
3. Tulsian P.C, Vishal Pandey, Quantitative Techniques (Theory and Problems), Pearson Education, Asia, First Indian Reprint 2002.

HSS020	**HUMAN RESOURCE MANAGEMENT**	L	T	P	C
		3	0	0	3

INTRODUCTION

Functions of a human resources manager - recruitment and selection processes interview methods.

HR- EVALUATION AND DEVELOPMENT

Performance appraisal, Training and development, disciplinary procedures, collective bargaining and employee welfare.

TRENDS IN HRM

The recent methods and trends in HRM with a few case studies in the context of globalization.

STRATEGIC ROLE OF HUMAN RESOURCE MANAGEMENT

Job analysis Personnel planning and recruiting Employee testing and selection, interviewing candidates, Appraising performance.

CAREER AND COMPENSATION

Managing careers Compensation Benefits and services Labor relations and collective bargaining Employee safety and health

REFERENCES

1. Decenzo and Robbins, Human Resource Management, Wiley, 6th edition, 2001.
2. Biswajeet Pattanayak, Human Resource Management, Prentice Hall of India, 2001.
3. Eugene McKenna and Nic Beach, Human Resource Management, Pearson Education.
4. Dessler, Human Resource Management, Pearson Education Limited, 2002.
5. Mamoria C.B and Mamoria S., Personnel Management, Himalaya Publishing.
6. Wayne Cascio, Managing Human Resources, McGraw-Hill, 1998.
7. Ivancevich, Human Resource Management, McGraw-Hill, 2002.

HSS023	ENTREPRENEURSHIP DEVELOPMENT	L	T	P	C
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ENTREPRENEURIAL COMPETENCE

Entrepreneurship concept – Entrepreneurship as a Career – Entrepreneur – Personality Characteristics of Successful. Entrepreneur – Knowledge and Skills Required for an Entrepreneur.

ENTREPRENEURIAL ENVIRONMENT

Business Environment - Role of Family and Society - Entrepreneurship Development Training and Other Support Organisational Services - Central and State Government Industrial Policies and Regulations - International Business.

BUSINESS PLAN PREPARATION

Sources of Product for Business – Pre-feasibility Study - Criteria for Selection of Product - Ownership - Capital - Budgeting Project Profile Preparation - Matching Entrepreneur with the Project - Feasibility Report Preparation and Evaluation Criteria.

LAUNCHING OF SMALL BUSINESS

Finance and Human Resource Mobilization Operations Planning - Market and Channel Selection - Growth Strategies - Product Launching.

MANAGEMENT OF SMALL BUSINESS

Monitoring and Evaluation of Business - Preventing Sickness and Rehabilitation of Business Units - Effective Management of small Business.

REFERENCES

1. Hisrich, Entrepreneurship, Tata McGraw Hill, New Delhi, 2001.
2. P. Saravanavel, Entrepreneurial Development, Ess Pee kay Publishing House, Chennai,1997.
3. S.S.Khanka, Entrepreneurial Development, S.Chand and Company Limited, New Delhi, 2001.
4. Prasama Chandra, Projects – Planning, Analysis, Selection, Implementation and Reviews, Tata McGraw-Hill Publishing Company Limited, 1996.
5. P.C.Jain (ed.), Handbook for New Entrepreneurs, EDII, Oxford University Press, New Delhi, 1999.
6. Staff College for Technical Education, Manila and Centre for Research and Industrial Staff Performance, Bhopal,

Entrepreneurship Development, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 1998.