REGULATIONS, CURRICULUM AND SYLLABUS

for

B. TECH

INFORMATION TECHNOLOGY

PONDICHERRY UNIVERSITY
PONDICHERRY-605 014

PONDICHERRY UNIVERSITY
BACHELOR OF TECHNOLOGY PROGRAMMES
(EIGHT SEMESTERS)
REGULATIONS

1. Conditions for Admission:

(a) Candidates for admission to the first semester of the 8 semester B.Tech Degree programme should be required to have passed :

The Higher Secondary Examination of the (10+2) curriculum (Academic Stream) prescribed by the Government of Tamil Nadu or any other examination equivalent there to with minimum of 45% marks (a mere pass for OBC and SC/ST candidates) in aggregate of subjects – Mathematics, Physics and any one of the following optional subjects: Chemistry / Biotechnology/ Computer Science / Biology (Botany & Zoology) or an Examination of any University or Authority recognized by the Executive Council of the Pondicherry University as equivalent thereto.

(b) For Lateral entry in to third semester of the eight semester B.Tech programme :

The minimum qualification for admission is a pass in three year diploma or four year sandwich diploma course in engineering / technology with a minimum of 60 % marks (50% marks for OBC and a mere pass for SC/ST candidates) in aggregate in the subjects covered from 3rd to final semester or a pass in any B.Sc. course with mathematics as one of the subjects of study with a minimum of 60 % marks (50% marks for OBC and a mere pass for SC/ST candidates) in aggregate in main and ancillary subjects excluding language subjects. The list of diploma programs approved for admission for each of the degree programs is given in **Annexure A**.

2. Age Limit :

The candidate should not have completed 21 years of age as on 1st July of the academic year under consideration. For Lateral Entry admission to second year of degree programme , candidates should not have completed 24 years as on 1st July of the academic year under consideration. In the case of SC/ST candidates, the age limit is relaxable by 3 years for both the cases.

3. Duration of Programme :

The Bachelor of Technology degree programme shall extend over a period of 8 consecutive semesters spread over 4 academic years – two semesters constituting one academic year. The duration of each semester shall normally be 15 weeks excluding examinations.

4. Eligibility for the award of Degree:

No candidate shall be eligible for the award of the degree of Bachelor of Technology, unless he/she has undergone the course for a period of 8 semesters (4 academic years) / 6 semesters (3 academic years for Lateral Entry candidates) in the faculty of Engineering and has passed the prescribed examinations in all the semesters.

5. Branches of Study:

Branch I - Civil Engineering
Branch II - Mechanical Engineering
Branch III - Electronics & Communication Engineering
Branch IV - Computer Science & Engineering
Branch V - Electrical & Electronics Engineering
Branch VI - Chemical Engineering
Branch VII - Electronics & Instrumentation Engineering
Branch VIII - Information Technology
Branch IX - Instrumentation & Control Engineering
Branch X - Biomedical Engineering

or any other branches of study as and when offered. The branch allocation shall be ordinarily done at the time of admission of the candidate to the first semester.

6. Subjects of Study:

The subjects of study shall include theory and practical courses as given in the curriculum and shall be in accordance with the prescribed syllabus. The subjects of study for the first two semesters shall be common for all branches of study.

7. Examinations:

The theory and practical examinations shall comprise continuous assessment throughout the semester in all subjects as well as university examinations conducted by Pondicherry University at the end of the semester (November / December or April / May).

(a) Theory courses for which there is a written paper of 75 marks in the university examination**.**

The Internal Assessment marks of 25 has to be distributed as 10 marks each for two class tests and 5 marks for class attendance in the particular subject. The distribution of marks for attendance is as follows.

5 marks for 95% and above
4 marks for 90% and above but below 95%
3 marks for 85% and above but below 90%
2 marks for 80% and above but below 85%
1 mark for 75% and above but below 80%

In total, three tests are to be conducted and the better two are to be considered for assessment.

(b) Practical courses for which there is a university practical examination of 50 marks**:**

The internal assessment marks of 50 has to be distributed as 20 marks for the periodic practical works and records submitted thereof, 15 marks for an internal practical examination, 5 marks for an internal viva voce, and 10 marks for class attendance in the particular subject. The distribution of marks is as given below.

10 marks for 95% and above
8 marks for 90% and above but below 95%
6 marks for 85% and above but below 90%
4 marks for 80% and above but below 85%
2 marks for 75% and above but below 80%

8. Requirement for appearing for University Examination:

A candidate shall be permitted to appear for university examinations at the end of any semester only if:

(i) He / She secures not less than 75% overall attendance arrived at by taking into account the total number of periods in all subjects put together offered by the institution for the semester under consideration.

(Candidates who secure overall attendance greater than 60% and less than 75% have to pay a condonation fee as prescribed by University along with a medical certificate obtained from a medical officer not below the rank of Asst. Director)

(ii) He / She earns a progress certificate from the Head of the institution for having satisfactorily completed the course of study in all the subjects pertaining to that semester.

(iii) His / Her conduct is found to be satisfactory as certified by the Head of the institution.

A candidate who has satisfied the requirement (i) to (iii) shall be deemed to have satisfied the course requirements for the semester.

9. Procedure for completing the course:

A candidate can join the course of study of any semester only at the time of its normal commencement and only if he/she has satisfied the course requirements for the previous semester and further has registered for the university examinations of the previous semester in all the subjects as well as all arrear subjects if any.

However, the entire course should be completed within 14 consecutive semesters (12 consecutive semesters for students admitted under lateral entry).

10. Passing Minimum:

(i) A candidate shall be declared to have passed the examination in a subject of study only if he/she secures not less than 50% of the total marks (Internal Assessment plus University examination marks) and not less than 40% of the marks in University examination.

(ii) A candidate who has been declared "Failed" in a particular subject may reappear for that subject during the subsequent semesters and secure a pass. However, there is a provision for revaluation of failed or passed subjects provided he/she fulfills the following norms for revaluation.

(a) Applications for revaluation should be filed within 4 weeks from the date of declaration of results or 15 days from the date of receipt of marks card whichever is earlier.

(b) The candidate should have attended all the college examinations as well as university examinations.

(c) If a candidate has failed in more than two papers in the current university examination, his/her representation for revaluation will not be considered.

(d) The request for revaluation must be made in the format prescribed duly recommended by the Head of the Institution along with the revaluation fee prescribed by the University.

The internal assessment marks obtained by the candidate shall be considered only in the first attempt for theory subjects alone. For the subsequent attempts, University examination marks will be made up to the total marks. Further the University examination marks obtained in the latest attempt shall alone remain valid in total suppression of the University examination marks obtained by the candidate in earlier attempts.

11 Award of Letter Grades:

The assessment of a course will be done on absolute marks basis. However, for the purpose of reporting the performance of a candidate, letter grades, each carrying certain points, will be awarded as per the range of total marks (out of 100) obtained by the candidate, as detailed below:

Range of Total Marks	Letter Grade	Grade Points
90 to 100	S	10
80 to 89	A	9
70 to 79	B	8
60 to 69	C	7
55 to 59	D	6
50 to 54	E	5
0 to 49	F	0
Incomplete	FA	

'F' denotes failure in the course. 'FA' denotes absent / detained as per clause 8.

After results are declared, grade sheets will be issued to the students. The grade sheets will contain the following details:

(a) The college in which the candidate has studied.

(b) The list of courses enrolled during the semester and the grades scored.

(c) The Grade Point Average (GPA) for the semester and The Cumulative Grade Point Average (CGPA) of all enrolled subjects from first semester onwards.

(d) GPA is the ratio of sum of the products of the number of credits (C) of courses registered and the corresponding grades points (GP) scored in those courses, taken for all the courses and sum of the number of credits of all the courses

$$GPA = \left(Sum\ of\ \ (C \times GP) / Sum\ of\ \ C \right)$$

CGPA will be calculated in a similar manner, considering all the courses enrolled from first semester. FA grades are to be excluded for calculating GPA and CGPA.

The conversion of CGPA into percentage marks is as given below

$$\%\, Marks = (CGPA - 0.5) \times 10$$

12 Award of Class and Rank:

(i) A candidate who satisfies the course requirements for all semesters and who passes all the examinations prescribed for all the eight semesters (six semesters for lateral entry candidates) within a maximum period of 7 years (6 years for lateral entry candidates) reckoned from the commencement of the first semester to which the candidate was admitted shall be declared to have qualified for the award of degree.

(ii) A candidate who qualifies for the award of the degree passing in all subjects pertaining to semesters 3 to 8 in his/her first appearance within 6 consecutive semesters (3 academic years) and in addition secures a CGPA of 8.50 and above for the semesters 3 to 8 shall be declared to have passed the examination in **FIRST CLASS** with **DISTINCTION**.

(iii) A candidate who qualifies for the award of the degree by passing in all subjects relating to semesters 3 to 8 within a maximum period of eight semesters after his/her commencement of study in the third semester and in addition secures CGPA not less than 6.5 shall declared to have passed the examination in **FIRST CLASS**.

(iv) All other candidates who qualify for the award of degree shall be declared to have passed the examination in **SECOND CLASS**.

(v) For the Award of University ranks and Gold Medal for each branch of study, the CGPA secured from 1st to 8th semester alone should be considered and it is mandatory that the candidate should have passed all the subjects from 1st to 8th semester in the first attempt. Rank certificates would be issued to the first ten candidates in each branch of study.

13. Provision for withdrawal:

A candidate may, for valid reasons, and on the recommendation of the Head of the Institution be granted permission by the University to withdraw from writing the entire semester examination as one Unit. The withdrawal application shall be valid only if it is made earlier than the commencement of the last theory examination pertaining to that semester. Withdrawal shall be permitted only once during the entire course. Other conditions being satisfactory, candidates who withdraw are also eligible to be awarded DISTINCTION whereas they are not eligible to be awarded a rank.

14. Discontinuation of Course:

If a candidate wishes to temporarily discontinue the course for valid reasons, he/she shall apply through the Head of the Institution in advance and obtain a written order from the University permitting discontinuance. A candidate after temporary discontinuance may rejoin the course only at the commencement of the semester at which he/she discontinued, provided he/she pays the prescribed fees to the University. The total period of completion of the course reckoned from the commencement of the first semester to which the candidate was admitted shall not in any case exceed 7 years, including of the period of discontinuance.

15. Revision of Regulations and Curriculum:

The University may from time to time revise, amend or change the regulations of curriculum and syllabus as and when found necessary.

ANNEXURE – A

B.Tech courses in which admission is sought	Diploma courses eligible for admission
Civil Engineering	Civil Engineering Civil and Rural Engineering Architectural Assistantship Architecture Agricultural Engineering
Mechanical Engineering	Mechanical Engineering Automobile Engineering Agricultural Engineering Mechanical and Rural Engineering Refrigeration and Air-conditioning Agricultural Engineering & Farm Equipment Technology Metallurgy Production Engineering Machine Design & Drafting Machine tool maintenance and Repairs Printing Technology / Engineering Textile Engineering / Technology Tool Engineering
Electrical and Electronics Engineering Electronics & Communication Engineering Electronic and Instrumentation Engineering Instrumentation and Control Engineering Bio Medical Engineering	Electrical Engineering Electrical and Electronics Engineering Electronics and Instrumentation Engineering Instrumentation Engineering / Technology Electronics and Communication Engg. Electronics Engineering Medical Electronics Instrumentation and Control Engineering Applied Electronics
Chemical Engineering	Chemical Engineering Chemical Technology Petrochemical Technology Petroleum Engineering Ceramic Technology Plastic Engineering Paper & Pulp Technology Polymer Technology
Information Technology Computer Science & Engineering	Computer Science and Engineering Computer Technology Electrical and Electronics Engineering Electronics & Communication Engineering Electronics & Instrumentation Engineering Instrumentation Engineering / Technology

B.Tech - INFORMATION TECHNOLOGY
CURRICULUM

I Semester

Code No.	Name of the Subjects	Periods			Credits	Marks		
		L	T	P		IA	UE	TM
	Theory							
T101	Mathematics – I	3	1	-	4	25	75	100
T102	Physics	4	-	-	4	25	75	100
T103	Chemistry	4	-	-	4	25	75	100
T104	Basic Electrical and Electronics Engineering	3	1	-	4	25	75	100
T105	Engineering Thermodynamics	3	1	-	4	25	75	100
T106	Computer Programming	3	1	-	3	25	75	100
	Practicals							
P101	Computer Programming Lab	-	-	3	2	50	50	100
P102	Engineering Graphics	2	-	3	2	50	50	100
P103	Basic Electrical and Electronics Lab	-	-	3	2	50	50	100
	Total	22	4	9	29	300	600	900

II Semester

Code No.	Name of the Subjects	Periods			Credits	Marks		
		L	T	P		IA	UE	TM
	Theory							
T107	Mathematics – II	3	1	-	4	25	75	100
T108	Material Science	4	-	-	3	25	75	100
T109	Environmental Science	4	-	-	3	25	75	100
T110	Basic Civil and Mechanical Engineering	4	-	-	4	25	75	100
T111	Engineering Mechanics	3	1	-	4	25	75	100
T112	Communicative English	4	-	-	3	25	75	100
	Practicals							
P104	Physics lab	-	-	3	2	50	50	100
P105	Chemistry lab	-	-	3	2	50	50	100
P106	Workshop Practice	-	-	3	2	50	50	100
P107	NSS / NCC *	-	-	-	-	-	-	-
	Total	22	2	9	27	300	600	900

* To be completed in I and II semesters, under Pass / Fail option only and not counted for CGPA calculation.

III Semester

Code No	Name of the Subjects	Periods			Credits	Marks		
		L	T	P		IA	UE	TM
	Theory							
MA T31	Mathematics III	3	1	-	4	25	75	100
IT T32	Electronic Devices and circuits	4	-	-	4	25	75	100
IT T33	Principles of Programming Languages	3	1	-	3	25	75	100
IT T34	Digital System Design	3	1	-	4	25	75	100
IT T35	Data Structures	3	1	-	4	25	75	100
IT T36	Computer Organization and Architecture	3	1	-	3	25	75	100
	Practicals							
IT P31	Electronic circuits lab	-	-	3	2	50	50	100
IT P32	Digital lab	-	-	3	2	50	50	100
IT P33	Data Structures lab	-	-	3	2	50	50	100
	Total	19	5	9	28	300	600	900

IV Semester

Code No	Name of the Subjects	Periods			Credits	Marks		
		L	T	P		IA	UE	TM
	Theory							
MA T41	Discrete Mathematics and Graph Theory	3	1	-	4	25	75	100
IT T42	Communication Engineering I	4	-	-	3	25	75	100
IT T43	Microprocessors and Applications	3	1	-	4	25	75	100
IT T44	Design and analysis of algorithms	3	1	-	4	25	75	100
IT T45	Operating systems	3	1	-	4	25	75	100
IT T46	Object Oriented design and Programming	3	1	-	4	25	75	100
	Practicals							
IT P41	Object Oriented Programming and Algorithms lab	-	-	3	2	50	50	100
IT P42	Microprocessor lab	-	-	3	2	50	50	100
IT P43	Operating Systems lab	-	-	3	2	50	50	100
PE P44	Physical Education *	-	-	-	-	-	-	-
	Total	19	5	9	29	300	600	900

* Under Pass / Fail option only and not accounted for CGPA calculation

V Semester

Code No	Name of the Subjects	Periods			Credits	Marks		
		L	T	P		IA	UE	TM
	Theory							
IT T51	Communication Engineering II	4	-	-	4	25	75	100
IT T52	Software Engineering	4	-	-	3	25	75	100
IT T53	Automata Languages and computation	3	1	-	4	25	75	100
IT T54	Java and Internet Programming	3	1	-	4	25	75	100
IT T55	System software and compilers	3	1	-	3	25	75	100
IT T56	Information Coding Techniques	3	1	-	3	25	75	100
	Practicals							
IT P51	Communication Engineering lab	-	-	3	2	50	50	100
IT P52	Visual Programming lab	-	-	3	2	50	50	100
IT P53	Java and Internet Programming lab	-	-	3	2	50	50	100
HS P54	General Proficiency-I	-	-	3	2	100	-	100
	TOTAL	20	4	12	29	400	600	1000

VI Semester

Code No	Name of the Subjects	Periods			Credits	Marks		
		L	T	P		IA	IE	TM
	Theory							
IT T61	Information Security	3	1	-	4	25	75	100
IT T62	Intelligent Computing	3	1	-	3	25	75	100
IT T63	Data Base Management Systems	3	1	-	4	25	75	100
IT T64	Computer networks	3	1	-	4	25	75	100
	Elective 1	4	-	-	3	25	75	100
	Elective 2	4	-	-	3	25	75	100
	Practicals							
IT P61	DBMS Lab	-	-	3	2	50	50	100
IT P62	Mini Project	-	-	3	2	50	50	100
IT P63	Computer networks lab	-	-	3	2	50	50	100
HS P64	General Proficiency-II	-	-	3	2	100	-	100
	TOTAL	20	4	12	29	400	600	1000

VII Semester

Code No	Name of the Subjects	Periods			Credits	Marks		
		L	T	P		IA	IE	TM
	Theory							
IT T71	Multimedia Systems	3	1	-	4	25	75	100
IT T72	Embedded systems	3	1	-	4	25	75	100
IT T73	Component Technology	3	1	-	3	25	75	100
	Elective 3	4	-	-	3	25	75	100
	Elective 4	4	-	-	3	25	75	100
	Practicals							
IT P71	Advanced Software Lab (Multimedia and Embedded)	-	-	3	2	50	50	100
IT P72	Component Technology Lab	-	-	3	2	50	50	100
IT P73	Project work (Phase I)	-	-	3	2	100	-	100
IT P74	Seminar	-	-	3	1	100	-	100
IT P75	Industrial Training/visit	-	-	3	1	100	-	100
	TOTAL	17	3	15	25	525	475	1000

VIII Semester

Code No	Name of the Subjects	Periods			Credits	Marks		
		L	T	P		IA	IE	TM
	Theory							
IT T81	Service Oriented Architecture	3	1	-	3	25	75	100
IT T82	Distributed Computing	3	1	-	3	25	75	100
IT T83	Management concepts and strategies	3	-	-	3	25	75	100
	Elective 5	4	-	-	3	25	75	100
	Elective 6	4	-	-	3	25	75	100
	Practicals							
HS P81	Professional ethics	-	-	3	1	100	-	100
IT P82	Project work (Phase II)	-	-	3	6	50	50	100
IT P83	Comprehensive viva voce	-	-	3	2	50	50	100
	TOTAL	17	2	9	24	325	475	800

Electives for 6th semester

S.No.	Code No.	Name of the Subjects
1	IT E61	Bio Informatics
2	IT E62	Parallel computing
3	IT E63	Computer Graphics
4	IT E64	Soft computing
5	IT E65	Digital signal processing
6	IT E66	Computer Hardware and Trouble shooting
7	IT E67	e - business
8	IT E68	Software testing

Electives for 7th semester

S.No.	Code No.	Name of the Subjects
1	IT E71	Mathematical statistics and numerical methods
2	IT E72	Business Process Management
3	IT E73	Image processing
4	IT E74	Web Technology
5	IT E75	Mobile communication networks
6	IT E76	User Interface Design
7	IT E77	Software architecture
8	IT E78	GIS and Remote Sensing
9	IT E79	Unix Internals

Electives for 8th semester

S.No.	Code No.	Name of the Subjects
1	IT E81	Real time systems
2	IT E82	Data mining and warehousing
3	IT E83	Natural Language Processing
4	IT E84	Enterprise Resource Planning
5	IT E85	Software project management
6	IT E86	High speed networks
7	IT E87	VLSI design
8	IT E88	C# and .Net framework
9	IT E89	Grid Computing

T 101 MATHEMATICS – I

Unit I - Calculus

Curvature, radius of curvature, evolutes and involutes. Beta and Gamma functions and their properties.

Unit II - Multiple Integrals And Applications

Multiple integrals – change of order of integration. Applications: Areas (double integration) and volumes by triple integration (Cartesian and polar) – mass and center of mass (constant and variable densities).

Unit III - Analytical Solid Geometry

Directional cosines and ratios – angle between two lines – the equation of plane - equations to a straight line and shortest distance between two skew lines.

Unit IV - Differential Equations

Exact equations, First order linear equations, Bernoulli's equation, orthogonal trajectories, growth and decay, geometrical applications and electric circuits. Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

Unit V - Differential Equations (Higher order)

Linear differential equations of higher order – with constant coefficients, the operator D - Euler's linear equation of higher order with variable coefficients - simultaneous linear differential equations – solution by variation of parameters method – simple applications to electric circuits.

Text Books

1. Venkataraman, M. K, Engineering Mathematics (First Year), Second Edition, The National Publishing Company, Madras, 2001.

Reference Books

1. Bali, N. P, and Manish Goyal, A Text Book of Engineering Mathematics, Lakshmi Publications, New Delhi, 2007.

T 102 PHYSICS

Unit I – Acoustics & NDT

ultrasonics - *U*ltrasonic Waves Productions (Piezoelectric & Magnetostriction method) – Detections (Acoustic Grating)
Acoustics - Factors affecting Acoustic of Buildings (Reverberation, Loudness, Focusing, Echo, Echelon Effect and Resonance) and their Remedies - Sabine's formula for Reverberation Time
NDT applications - Pulse Echo Method - Liquid Penetrant Method

Unit II – Optics

Interference - Air Wedge – Michelson's Interferometer – Wavelength Determination – Interference Filter – Antireflection Coatings
Diffraction - Diffraction Grating – Dispersive power of grating - Resolving Power of Grating & Prism
Polarisation - Huygens Theory of Double Refraction – Quarter and Half Wave Plates – Specific Rotary Power – Laurent Half Shade Polarimeter

Unit III – Lasers & Fiber Optics

Lasers - Principles of Laser – Spontaneous and Stimulated Emissions - Einstein's Coefficients – Population Inversion and Laser Action – Optical resonators – Types of Lasers - NdYAG, CO_2 laser, GaAs Laser
Fiber Optics - Principle and Propagation of light in optical fiber – Numerical aperture and acceptance angle – Types of optical fibers (material, refractive index, mode)

Unit IV – Wave mechanics

Matter Waves – de Broglie Wavelength – Uncertainty Principle – Schrödinger Wave Equation – Time Dependent – Time Independent – Application to Particle in a One Dimensional Box – Quantum Mechanical Tunneling – Tunnel Diode.

Unit V – Nuclear energy source

General Properties of Nucleus (Size, Mass, Density, Charge) – Mass Defect – Binding Energy - Disintegration in fission – Nuclear Fusion (p-p & C-N cycle) – *Nuclear Reactor:* Materials Used in Nuclear Reactors. – PWR – BWR - FBTR

Text Books

1. A S Vasudeva, Modern Engineering Physics, S. Chand & Co, New Delhi, 2006.
2. V Rajendran, Engineering Physics, TMH, New Delhi 2008.

Reference Books

1. Richtmyer, Kennard and cooper , Introduction to Modern Physics, TMH, New Delhi 2005.
2. Ajay Ghatak, Optics, TMH, New Delhi, 2007.
3. Thiagarajan and Ghatak, Laser and Application, TMH, New Delhi 2008.
4. Arthur Beiser, Concept of Modern Physics, TMH, New Delhi 2008.
5. Avadhanulu M N and Kshir Sagar , A Text Book of Engineering Physics, S. Chand & Co, 2007.
6 . R. Murugeshan, Modern Physics, S. Chand & Co, New Delhi 2006.
7 . K.R.Nambiar, Lasers, New Age International, New Delhi, 2008.

T 103 CHEMISTRY

Unit I -Water

Hardness of water – units and calcium carbonate equivalent. Determination of hardness of water-EDTA method. Disadvantages of hardwater-boiler scale and sludge, caustic embrittlement, priming & foaming and boiler corrosion. Water softening method – internal & external conditioning – lime-soda process, zeolite process and ion exchange process. Desalination – reverse osmosis & electrodialysis.

Unit II – Polymers

Classification, types of polymerization reactions - mechanism of radical, ionic and Ziegler-Natta polymerizations. Polymer properties - chemical resistance, crystallinity and effect of temperature. Thermoplastics and thermosets. Polymerization techniques - bulk, suspension, emulsion, solution and gas phase polymerization. Preparation, properties and uses of PVC, TEFLON, Nylons, Bakelite, polyurethane, Mn and Mw. Rubbers - vulcanization, synthetic rubber, buna S, buna N, silicone and butyl rubber. Conducting polymers - classification and applications. Polymer composites – FRP - laminar composites.

Unit III - Electrochemical Cells

Galvanic cells, single electrode potential, standard electrode potential, electromotive series. EMF of a cell and its measurement. Nernst equation. Electrolyte concentration cell. Reference electrodes-hydrogen calomel, Ag /AgCl & glass electrodes. Batteries - primary and secondary cells, laclanche cell, lead acid storage cell, Ni-Cd battery & alkaline battery. Fuel cells - H_2-O_2 fuel cell.

Unit IV - Corrosion And Its Control

Chemical & electrochemical corrosion-Galvanic series-galvanic, pitting, stress and concentration cell corrosion. Factors influencing corrosion-corrosion control methods - cathodic protection and corrosion inhibitors. Protective coating - types of protective coatings-metallic coating-tinning and galvanizing, cladding, electroplating and anodizing.

Unit V -Phase Rule

Definition and derivation of phase rule. Application to one component system - water and sulphur systems. Thermal analysis, condensed phase rule. Two component alloy systems - Pb-Ag, Cu-Ni and Mg-Zn systems.

Text books

1. P.C. Jain and Monika Jain, Engineering Chemistry, Dhanpat Rai and Sons, New Delhi 2004.
2. N. Krishnamurthy, P. Vallinayagam and D. Madhavan, Engineering Chemistry, 2nd edition. PHI Learning PVT., LTD, New Delhi, 2008.

Reference Books

1. S. S. Dara, A Textbook of Engineering Chemistry, S. Chand & Co., Ltd. New Delhi.
2. B. K. Sharma, Engineering Chemistry, 3rd edition Krishna Prakashan Media (P) Ltd., Meerut, 2001.

T 104 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Part A - Electrical

Unit – I

Review of Kirchoff's laws – series and parallel circuits, equivalent resistance, star/delta conversion. Concepts of AC circuits – rms value, average value, form and peak factors – real and reactive power – power factor.

Unit – II

Node and mesh methods of analysis of DC circuits and simple AC circuits. Introduction to three phase circuits, Introduction to three phase system - phase and line parameters – relations, power measurement – voltmeter and ammeter method, two and three wattmeter methods.

Unit – III

Principle of DC generator and motor, Transformer, synchronous generator, induction motor (single phase). Sources for electrical energy conversion-thermal and hydraulic plant (Block diagram approach only). Components of AC transmission and distributions systems – line diagram.

Part B – Electronics

Unit – IV

Half-wave rectifier and Full-wave rectifier- filters - Amplifiers-common emitter and common collector amplifiers- Hartley oscillator and RC phase shift oscillator.
Transducers – Resistance temperature detector (RTD) – Linear variable differential transformer (LVDT) - Strain gauge – Piezo electric transducer.

Unit – V

Boolean algebra – Reduction of Boolean expressions – De-Morgan's theorem – Logic gates – Implementation of Boolean expressions – Flip flops – RS, JK, T and D. Combinational logic – Half adder, Full adder and Subtractors. Sequential logic – Ripple counters and shift registers.

Unit – VI

Model of communication system – Analog and digital – Wired and wireless channel. Block diagram of various communication systems – Microwave, satellite, optical fiber and cellular mobile system.
Network model – LAN, MAN and WAN – Circuit and packet switching – Overview of ISDN.

Text Books

1. Hughes revised by John Hiley, Keith Brown, Ian McKenzie Smith, Electrical and Electronics Technology, Pearson Education Limited, New Delhi, 2007.
2. Smarajit Ghosh, Fundamentals of Electrical and Electronics Engineering, Second Edition, Prentice Hall of India Private Limited.
3. George Kennedy and Bernard Davis, Electronics communication Systems, Tata McGraw-Hill Ltd, New Delhi.

Reference Books

1. D.P.Kothari and I.J.Nagrath, Theory and Problems of Basic Electrical Engineering, Prentice Hall of India Ltd., New Delhi.
2. J.B.Gupta, A Course in Electrical Power, Katson Publishing House, New Delhi, 1993.

T 105 ENGINEERING THERMODYNAMICS

Unit I - Basic Concepts and Definitions

Energy conversion and efficiencies - System, property and state - Thermal equilibrium - Temperature - Zeroth law of Thermodynamics.

Unit II - First Law of Thermodynamics

The concept of work and adiabatic process - First law of thermodynamics - Conservation of Energy principle for closed and open systems - Calculation of work for different processes of expansion of gases

Unit III - Second Law of Thermodynamics

Equilibrium and the second law - Heat engines - Kelvin-Planck statement of second law of thermodynamics - Reversible and irreversible processes - Carnot principle - Clausius inequality- Entropy

Unit IV - Gas Power Cycles

Air standard cycles: The air standard Carnot cycle - Air standard Otto cycle, diesel cycle, dual cycle and Bryton cycles and their efficiencies

Unit V - Refrigeration Cycles and Systems

Reverse Carnot cycle - COP - Vapor compression refrigeration cycle and systems (only theory) - Gas refrigeration cycle - Absorption refrigeration system (only theory)- Liquifaction and solidification of gases

Text Books

1. Nag, P. K., “Engineering Thermodynamics”, 4th edition, Tata Mc Graw Hill Publishing Co. Ltd., New Delhi,1995
2. Wark, K., “Thermodynamics”, 4th edition ,Mc Graw Hill, N.Y.,1985

Reference Books

1. Arora, C.P., “Thermodynamics”, Tata Mc Graw Hill Publishing Co. Ltd., New Delhi,1998.
2. Burghardt, M.D., “Engineering Thermodynamics with Applications”, 4th edition, Harper & Row, N.Y., 1986.
3. Huang, F.F., “Engineering Thermodynamics” 2nd edition , Macmillan Publishing Co.Ltd., N.Y.,1989.
4. Cengel, Y.A. and Boles, M.A., "Thermodynamics - An Engineering Approach", 5thedition, Mc-Graw Hill, 2006

T 106 COMPUTER PROGRAMMING

Unit – I

History of Computers – Block diagram of a Computer – Components of a Computer system – Classification of computers - Hardware – Software – categories of Software – Operating System – Applications of Computers - Role of Information Technology – Internet and its services – Intranet – Study of word processor – Preparation of worksheets

Unit – II

Problem solving techniques – Program – Program development cycle – Algorithm design – Flowchart - Pseudo code.
Introduction to C – C tokens – data types – Operators and expressions – I/O functions

Unit – III

Decision making statements – branching and looping – arrays – multidimensional arrays – Functions – Recursion – Passing array to functions
Storage classes – Strings – String library functions

Unit – IV

Structures – Arrays and Structures – nested structures – passing structures to functions – user defined data types– Union
Pointers – pointers and arrays – pointers and functions - pointers and strings - pointers and structures

Unit – V

Files – operations on a file – Random access to files – command line arguments
Introduction to preprocessor – Macro substitution directives – File inclusion directives – conditional compilation directives – Miscellaneous directives

Text Books

1. Ashok N Kamthane, “Computer Programming”, Pearson education, Second Impression, 2008.
3. Venugopal.K and Kavichithra.C, “Computer Programming”, New Age International Publishers, First Edition, 2007.

Reference Book

1. Balagurusamy. E, “Programming in ANSI C”, Tata McGraw Hill, Third edition, 2006.

P 101 COMPUTER PROGRAMMING LAB

List of Exercises

OS Commands, Word Processor and Spreadsheets

1. Study of OS commands-Compilation and execution of simple C programs
2. Use of mail merge in word processor
3. Use of spreadsheet to create Charts(XY, Bar, Pie) and apply the formulae wherever necessary C Programming (Flowcharts and algorithms are essential for the programming exercises)
4. Greatest of three numbers using conditional operator and if statement
5. Read two numbers and swap those two numbers using temporary variable and without using temporary variable.
6. Solve quadratic equation for different sets of inputs.
7. Use of Switch….Case statements
8. Generation of prime and Fibonacci series
9. Evaluate the COSINE series using for, while and do while loops
10. Matrix operations
    a) Addition
    b) Transpose
    c) Multiplication
11. Evaluate the sin(x) series using functions and recursive functions
12. Read a string and find solution to remove the duplicates of a given string from the given sentence
13. Create an array of structures for a list of items with the following details

Item - Code	Item_ Name
102	Paste – Colgate
102	Paste –Pepsodent
102	Paste –Close-up
101	Soap-Cinthol
101	Soap-Lux
101	Soap-Hamam
101	Soap-Dove

Arrange the set of items in ascending order of its Item_Code and descending order of its Item_ name as given below

Item-Code	Item_ Name
101	Soap-Lux
101	Soap-Hamam
101	Soap-Dove
101	Soap-Cinthol
102	Paste –Pepsodent
102	Paste –Colgate
102	Paste – Close-up

14. Use of Structure to define a user defined data types, input the data and write the data into the file
15. Use of pointers and array of pointers
16. Functions with static data types
17. Write command line program to implement the following DOS commands using files
    - Del
    - Copy

P 102 ENGINEERING GRAPHICS

Unit 0

Introduction to Standards for Engineering Drawing practice, Lettering, Line work and Dimensioning

Unit I

Conic sections, Involutes, Spirals, Helix. Projection of Points, Lines and Planes

Unit II

Projection of Solids and Sections of Solids.

Unit III

Development of surfaces - Intersection of surfaces (cylinder-cylinder, cylinder-cone)

Unit IV

Isometric projections and Orthographic projections

Unit V

Computer Aided Drafting: Introduction to Computer Aided Drafting hardware - Overview of application software - 2D drafting commands (Auto CAD) for simple shapes - Dimensioning.

Text Books

1. Gopalakrishna K.R. and Sudhir Gopalakrishna, Engineering Graphics, Inzinc Publishers, 2007.
2. Natarajan K.V., A Text Book of Engineering Drawing, Dhanalakshmi Publishers, 2006. BIS, Engineering Drawing practice for Schools & College, 1992.

Reference Books

1. Bhatt N.D., Engineering Drawing, 49th edition, Chorotar Publishing House, 2006.
2. Venugopal K., Engineering Drawing and Grahics + Auto CAD, 4th edition, New Age International Publication Ltd., 2004 .
3. David I cook and Robert N Mc Dougal, Engineering Graphics and Design with computer applications, Holt – Sounders Int. Edn. 1985.
4. James D Bethune and et. al., Modern Drafting, Prentice Hall Int., 1989.

P 103 BASIC ELECTRICAL AND ELECTRONICS LAB

Electrical Lab

1. Study of tools and accessories
2. Study of joints
3. Staircase wiring
4. Doctor's room wiring
5. Godown wiring
6. Tube Light and Fan connection
7. Lamp controlled from three different places-wiring

Electronics Lab

1. Rectifiers

Construction of half wave and full wave rectifiers with and without filters – Calculation of ripple factors.

2. Frequency Response of RC Coupled Amplifiers

Determination of frequency response of given RC coupled amplifier - Calculation of bandwidth.

3. Verification of Kirchoff's Voltage and Current Laws

Determine the voltage and current in given circuits using Kirchoff"s laws theoretically and verify the laws experimentally.

4. Study of Logic Gates
    a. Verification of Demorgan's theorems
    b. Verification of truth tables of OR, AND, NOT, NAND, NOR, EX-OR, EX-NOR gates and Flipflops - JK, RS, T and D
    c. Implementation of digital functions using logic gates

5. Study of CRO
    a. Measurement of AC and DC voltages
    b. Frequency and phase measurements (using Lissajou's figures)

6. Study of Transducers
    a. Displacement and load measurements with transducers
    b. Temperature measurement with thermocouple

T 107 MATHEMATICS – II

Unit I - Algebra

Binomial, exponential and logarithmic series (without proof) – problems on summation, approximation and coefficients.

Unit II – Matrices

Inverse of matrix by row transformation – Eigen values and Eigen vectors - Cayley-Hamilton theorem (without proof) – Diagonalisation – rank of matrix – solution of a general system of m linear algebraic equations in n unknown ($m \leq n$).

Unit III – Trigonometry

Expansions for $\sin^n \theta$, $\cos^n \theta$, $\tan^n \theta$, $\sin(n\theta)$, $\cos(n\theta)$, $\tan(n\theta)$. Exponential, circular, hyperbolic, inverse hyperbolic and logarithmic functions of a complex variable – separation of real and imaginary parts.

Unit IV - Vector Analysis

Scalar fields and Vector fields – Gradient, Divergence and Curl – their properties and relations – Gauss and Stokes theorems (without proof), simple problems for their verification.

Unit V - Statistics

Moments, kurtosis and skewness based on moments only. Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions. Correlation and regression – rank correlation.

Text Books

1. Venkataraman M.K, Engineering Mathematics (First Year), Second Edition, The National Publishing Company, Madras, 2001.
2. Venkataraman M.K, Engineering Mathematics (Third Year-Part A), The National Publishing Company, Madras, 2001.

Reference Book

1. Bali N.P. and Manish Goyal, A Text Book of Engineering Mathematics, Lakshmi Publications, New Delhi, 2007.

T 108 MATERIAL SCIENCE

Unit I - Crystal structure and Defects

Crystal Systems – Bravais Lattices – Coordination Number, Atomic Radius, Packing Factor for FCC & HCP structures – Miller Indices for a cubic crystal– Powder X Ray Diffraction Method - Lattice defects – Qualitative ideas of point, line, surface and volume defects

Unit II – Dielectric properties

Dielectric Polarization and Mechanism – Internal or local Field - Clausius-Mossotti relation – Dielectric loss - Temperature and frequency dependence of dielectric constant – Measurement of Dielectric constant and loss using Scherring bridge – Elementary ideas of Piezoelectrics, Ferroelectrics and Pyroelectric materials and its Applications

Unit III – Magnetic Properties

Elementary Ideas of classification of magnetic materials (Dia, Para, Ferro & Ferri) – Quantum theory of Para & Ferro Magnetism – Domain Theory of Hysteresis – Heisenberg Theory of Exchange Interaction (without derivation) – Qualitative ideas of Anti ferromagnetic Ordering – Structure and Properties of Ferrites – Properties of Soft & Hard Magnetic Materials – Applications: floppy disks, CD ROM, Magneto optical recording

Unit IV – Semiconductors and superconductors

Derivation of Carrier concentration in intrinsic Semiconductor – Hall effect in Semiconductors -- Application of Hall Effect - Basic Ideas of Compound Semiconductors (II-VI & III-V) - Basic concepts of superconductivity – transition temperature – Meissener effect – Type I and II superconductors – high temperature superconductors – 123 superconductor.

Unit V – Advanced Materials

Liquid Crystals – Types – Application as Display Devices – Metallic Glasses – Nanomaterials (one, Two & three Dimensional) – Physical Properties and Applications of Carbon Nano Tubes

Text books

1. V Raghavan , Materials Science and Engineering- A First Course, Prentice Hall of India, 2008.
2. M Arumugam , Materials Science, Anuratha Printers, 2004.

Reference Books

1. Ali Omar M, Elementary Solid State Physics, Addison Wesley Publishing Co., 2000.
2. William D Callister Jr., Material Science and Engineering, John Wiley and sons, 2006.
3. Srivatsava J P, Elements of Solid State Physics, Prentice Hall of India, 2001.
4. Charles Kittel, Introduction to Solid State Physics, John Wiley & sons, Singapore, 2007.
5. Pillai S.O, Solid State Physics– New Age International, 2005.
6. Charles P Poole & Frank 5. J Owens, Introduction to Nanotechnology, Wiley nterscience, 2003.

T 109 ENVIRONMENTAL SCIENCE

Unit I - Environmental Segments And Natural Resources

Environmental segments-lithosphere, hydrosphere, biosphere and atmosphere-layers of atmosphere. Pollution-definition and classification. Pollutants-classification. Forest resources-use and overexploitation, deforestation, forest management. Water resources-sources, use and conflicts over water, dams-benefits and problems. Mineral resources-mineral wealth of India, environmental effects of extracting and using mineral resources. Food resources-world food problems, environmental impact of modern agriculture-fertilizer and pesticides, overgrazing and land resources-land degradation- land slides, soil erosion and desertification. Energy resources-growing energy needs renewable and non-renewable energy resources and use of alternate-energy sources.

Unit II - Ecosystem & Biodiversity

Concept of an ecosystem-structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of forest, grass land, desert and aquatic (fresh water, estuarine and marine) ecosystem. Biodiversity-definition-genetic species and ecosystem diversity. Value of biodiversity – consumptive use, productive use, social, ethical, aesthetic and option values. Hot spots of biodiversity. Threats to biodiversity-habitat loss, poaching of wild life, human-wildlife conflicts. Endangered and endemic species. Conservation of biodiversity-in situ and ex-situ conservation of biodiversity.

Unit III - Air Pollution

Air pollution-sources of air pollution. Sources, effects and control measures of oxides of nitrogen, oxides of sulphur, oxides of carbon, hydrocarbon, chlorofluro carbons and particulates. Green house effect-causes and effects on global climate and consequences. Ozone depletion-causes, mechanism and effect on the environment. Smog-sulfurous and photochemical smog-effect on the environment. Acid rain-theory of acid rain and effects.

Unit IV - Water Pollution And Solid Waste Management

Sources, effects and control measures of –water pollution, soil pollution, marine pollution, noise pollution, thermal pollution and radioactive pollution. Solid waste management – causes, effect and control measures of urban and industrial wastes.

Unit V - Social Issues And The Environment

From unsustainable to sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, water shed management. Resettlement and rehabilitation of people. Environmental ethics. Consumerism and waste products. Environmental protection act-air (prevention and control of pollution) act, water (prevention and control of pollution) act, wildlife protection act, forest conservation act. Role of an individual in prevention of pollution.
Human population and the environment-population growth, variation among nations, population explosion, role of information technology in environment and human health.

Text Books

1. Raghavan Nambiar K., “Text Book of Environmental Studies” 2nd edition, Scitech Publications, India, Pvt. Ltd, Chennai, 2008.
2. A.K. De, “Environmental chemistry” 6rd edn; New age international (P) Ltd, New Delhi, 2006.

Reference Books

1) Sharma B.K., “Environmental chemistry” goel publishing house, Meerut, 2001.
2) Sodhi G. S., Fundamental concepts of environmental chemistry, Narosa publishing house, New Delhi
3) Dara S .S., “ A text book of environmental chemistry and pollution control, S. Chand & Company Ltd, New Delhi, 2002.
4) Richard T. Wright, environmental science, 9th edition, Pearson education inc, New Delhi, 2007
5) Meenakshi P., “Elements of environmental science and engineering” Prentice-hall of India, New Delhi, 2006.

T 110 BASIC CIVIL AND MECHANICAL ENGINEERING

Part-A Civil Engineering

Unit I - Buildings, Building Materials

Buildings-Definition-Classification according to NBC-plinth area, Floor area, carpet area, floor space index-construction materials-stone, brick, cement, cement-mortar, concrete, steel- their properties and uses.

Unit II - Buildings and their components

Buildings- Various Components and their functions. Soils and their classification Foundations-Functions and types of foundations, Masonry, Floors-functions and types of floors, Roofs and types of roofs.

Unit III - Basic Infrastructure

Surveying-classification, general principles of surveying – Basic terms and definitions of chain, compass and leveling surveying , uses of surveying , contours, their characteristics and uses. Roads-types, Water bound macadam road, cement concrete road, bituminous road. Bridges-components and types of bridges. Dams-Purpose, selection of site, types of dams and components. Water supply-sources and quality requirements. Rainwater harvesting.

PART - B Mechanical Engineering

Unit IV - Internal and external combustion systems

Working principles of IC engines – Classification – Diesel and petrol engines: two stroke and four stroke engines. Steam generators(Boilers) – Classification – Constructional features (of only low pressure boilers) – Boiler mountings and accessories.

Conventional Power Generation Systems

Hydraulic, steam and gas turbines power plants – Schemes and layouts – Selection criteria of above power plants.

Unit V - Non-Conventional Energy Systems (Description Only)

Solar thermal systems – Solar photovoltaic – Solar pond – wind, wave, tidal, geothermal and ocean thermal energy conversion systems.

Casting

Green and dry sand moulding processes for ferrous and non-ferrous metals – applications.

Unit VI - Metal Joining

Elements of arc and gas welding, brazing and soldering – Bolted joint types – Adhesive Bonding; classification of adhesives – applications. Sheet Metal Processing Punching, blanking, shearing, bending, and deep drawing processes; descriptions and applications

Text Books

For Part –A

a) Purushothama Raj.P., Basic civil engineering, 3rd Edn., Dhanam Publications, Chennai, 2001.

b) Natarajan, K V, Basic Civil Engineering, 11th Edition, Dhanalakshmi Publications, Chennai, 2001.

For Part –B

1. Lindberg, R.A.Process and Materials of Manufacture, PHI, 1999.
2. Nagpal, Power Plant Engineering, Khanna Publishers, Delhi, 1998.

Reference Books

1. Rajput, R K, Engineering Materials, S Chand & Co. Ltd., New Delhi, 2002.
2. Punmia, B.C., et. al., Surveying , Vol-I, Laxmi Publishers, New Delhi, 2002.
3. Punmia, B.C., et.al Building Construction, Laxmi Publishers, New Delhi ,2002.
4. El.Wakil, M.M., Power Plant Technology, Mc Graw Hill Book Co., 1985.

5.Hajra Choudhry, et. al., Workshop Technology Vol I and II, Media Promoters Publishers Pvt. Ltd., Bombay, 2004.

T 111 ENGINEERING MECHANICS

Unit I - Fundamental of Mechanics

Basic Concepts Force System and Equilibrium, Definition of Force, Moment and Couple, Principle of Transmissibility, Varignon's theorem, Resultant of force system – Concurrent and non concurrent coplanar forces, Condition of static equilibrium for coplanar force system, stability of equilibrium, concept of free body diagrams, applications in solving the problems on static equilibrium of bodies.

Unit II - Plane Trusses

Degrees of freedom, Types of supports and reactions, Types of loads, Analysis of Trusses-method of joints, method of sections.
Friction. Introduction, Static dry friction, simple contact friction problems, ladders, wedges, screws and belt friction.

Unit III - Properties of Surfaces

Properties of sections – area, centroids of lines, areas and volumes, moment of inertia first moment of inertia, second moment of inertia and product moment of inertia, polar moment of inertia, radius of gyration, mass moment of inertia.

Unit IV - Kinematics and Kinetics of Particles

Equations of motion - Rectilinear motion, curvelinear motion, Relative motion, D'Alembert's principle, work- Energy equation – Conservative forces and principle of conservation of energy, Impulse – momentum, Impact – Direct central impact and oblique central impact.

Unit V - Kinematics and Kinetics of Rigid bodies

Plane motion, Absolute motion, Relative motion, translating axes and rotating axes, work and energy, impulse and momentum

Text Books

1. Bhavikatti,S.S and K.G.Rajashekarappa, Engineering Mechanics, New Age International (P) Ltd, New Delhi,2008.
2. Rajesekaran, S and Sankara Subramanian., G., Engineering Mechanics, Vikas Publishing House Private Ltd., 2002.

Reference Books

1. Palanichamy, M.S. Nagan, S., Engineering Mechanics – Statics & Dynamics, Tata McGraw-Hill,2001.
2. Beer, F.P and Johnson Jr. E.R, Vector Mechanics for Engineers, Vol. 1 Statics and Vol.2 Dynamics, McGraw – Hill International Edition, 1997.

T112 COMMUNICATIVE ENGLISH

Unit I – Basic Communication Theory

Importance of Communication – stages of communication, modes of communication – barriers to communication – strategies for effective communication – Listening: Importance, types, barriers – Developing effective listening skills.

Unit II – Comprehension And Analysis

Comprehension of technical and non-technical material – Skimming, scanning, inferring-Note making and extension of vocabulary, predicting and responding to context- Intensive Reading and Reviewing

Unit III – Writing

Effective sentences, cohesive writing, clarity and conciseness in writing – Introduction to Technical Writing – Better paragraphs, Definitions, Practice in Summary Writing – Four modes of writing – Use of dictionaries, indices, library references – making bibliographical entries with regard to sources from books, journals, internet etc.

Unit IV – Business Writing / Correspondence

Report writing – Memoranda – Notice – Instruction – Letters – Resumes – Job applications

Unit V – Oral Communication

Basics of phonetics – Presentation skills – Group Discussions – Dialogue writing – Short Extempore – Debates-Role Plays-Conversation Practice

Reference Books

1. Ashraf M.Rizvi., Effective Technical Communication. Tata-McGraw, 2005.
2. Boove, Courtland R et al., Business Communication Today. Delhi. Pearson Education ,2002.
3. Meenakshi Raman and Sangeeta Sharma., Technical Communication Principles And Practice,OUP, 2007.
4. Robert J.Dixson. ,Complete Course in English, Prentice-Hall of India Pvt. Ltd., New Delhi,2006.
5. Robert J.Dixson., Everyday Dialogues in English, Prentice-Hall of India Pvt. Ltd., New Delhi,2007.
6. Sethi,J and Kamalesh Sadanand., A Practical Course in English Pronunciation, Prentice-Hall of India Pvt. Ltd, New Delhi,2007.

P 104 PHYSICS LABORATORY

List of experiments (Any 10 Experiments)

1. Thermal conductivity – Lee's DISC
2. Thermal conductivity - Radial flow
3. Spectrometer – Prism or Hollow prism
4. Spectrometer – Transmission grating
5. Spectrometer - Ordinary & Extraordinary rays
6. Newton's rings
7. Air – wedge
8. Half shade polarimeter – Determination of specific rotatory power
9. Jolly's experiment – determination of α
10. Magnetism: i – h curve
11. Field along the axis of coil carrying current
12. Vibration magnetometer – calculation of magnetic moment & pole strength
13. Laser experiment: wavelength determination using transmission grating, reflection grating (vernier calipers) & particle size determination
14. Determination of optical absorption coefficient of materials using laser
15. Determination of numerical aperture of an optical fiber

P105 CHEMISTRY LABORATORY

List of experiments (Any 10 Experiments)

1. Determination of dissolved oxygen in water.
2. Determination of total hardness of water by EDTA method.
3. Determination of carbonate and bicarbonate in water.
4. Estimation of chloride content in water.
5. Estimation of magnesium by EDTA.
6. Estimation of vinegar.
7. Estimation of ferrous by permanganometry.
8. Estimation of ferrous and ferric iron in a solution mixture by dichrometry.
9. Estimation of available chlorine in bleaching powder.
10. Estimation of copper in copper sulphate solution.
11. Estimation of calcium by permanganometry.
12. Estimation of iron by colorimetry.

Demonstration Experiments(Any two of the following)

1. Determination of COD of water sample.
2. Determination of lead by conductometry.
3. Percentage composition of sugar solution by viscometry.

P 106 WORKSHOP PRACTICE

Sl.No.	Trade	List of Exercises
1.	Fitting	Study of tools and Machineries. Exercises on symmetric joints and joints with acute angle.
2.	Welding	Study of arc and gas welding equipment and tools – Edge preparation – Exercises on lap joint and V Butt joints – Demonstration of gas welding
3	Sheet metal work	Study of tools and Machineries – exercises on simple products like Office tray and waste collection tray.
4.	Carpentry	Study of tools and Machineries – Exercises on Lap joints and Mortise joints

List of Exercises

I Fitting

1.Study of tools and Machineries
2.Symmetric fitting
3.Acute angle fitting

II Welding

1.Study of arc and gas welding equipment and tools
2.Simple lap welding (Arc)
3.Single V butt welding (Arc)

III Sheet metal work

1.Study of tools and machineries
2.Funnel
3.Waste collection tray

IV Carpentry

1.Study of tools and machineries
2.Half lap joint
3.Corner mortise joint.

P107 NSS / NCC

NCC/NSS training is compulsory for all Undergraduate students

1. The activities will include Practical/field activities/Extension lectures.
2. The activities shall be carried out outside class hours.
3. For the above activities, the student participation shall be for a minimum period of 45 hours.
4. The activities will be monitored by the respective faculty in charge and the First Year Coordinator.
5. Pass /Fail will be determined on the basis of participation, attendance, performance and behavior. If a candidate Fails, he/she has to repeat the course in the subsequent years
6. Pass in this course is mandatory for the award of degree.

MA T31 MATHEMATICS – III

Unit I – Laplace Transform

Definitions - Laplace transform of unit impulse and step functions - Laplace transform of periodic functions - Exponential shift formula- Initial and final value theorems - Laplace transform of derivatives and integrals - Convolution theorem - Inverse Laplace transform - Methods of determining inverse Laplace transform -Solution of linear differential equations using Laplace transforms. (12 Hours)

Unit II – Function Of A Complex Variable

Functions of a complex variable - continuity, derivative and analytic function - Cauchy - Riemann equations – Necessary and sufficient conditions for analyticity - Harmonic and orthogonal properties of real and imaginary parts - Conformal mapping - Bilinear transformations.

(12 Hours)

Unit III – Complex Integration

Cauchy's theorem -Cauchy's integral formula - Taylor's and Laurent series - Residue theorem - Contour integration round the unit circle and semi-circular contour.

(12 Hours)

Unit IV – Fourier Series

Dirichlet's conditions - Expansion of periodic functions into Fourier series- Change of interval- Half-range Fourier series.

Complex form of Fourier series - Root mean square value - Parseval's theorem on Fourier coefficients - Harmonic analysis. (10 Hours)

Unit V - Fourier Transform

Fourier Integral (statement only), Fourier transform, Inverse Fourier transform - Fourier sine and cosine transforms, definitions and properties. (12 Hours)

Text Books

1. M.K.Venkataraman, Engineering Mathematics, Vol. II, National Publishing co. Madras, 2009 (for Units I, II, and III) .
2. M.K.Venkataraman, Engineering Mathematics, Vol. III, National Publishing co. Madras, 2009 (for Units IV & V).

Reference Books

1. N.P. Bali & Manish Goyal : A text book of Engineering Mathematics, Laxmi Publications, New- Delhi, 2008.
2. Erwin Kreyszig : Advanced Engineering Mathematics, John- Wiley sons, New-York, 2005.
3. B. S. Grewal, : Higher Engineering Mathematics, Khanna Publishers, New-Delhi, 2008.

IT T32 ELECTRONIC DEVICES AND CIRCUITS

Unit I – Diode and Its Applications

Diode equivalent circuits – diode as a switch – applications –Half wave and full wave rectifiers – Filters – Ripple factor and rectification efficiency – Clippers and clampers – Voltage doubler and trippler – Voltage regulation – Series and shunt voltage regulators.

Unit II – Small Signal Amplifiers

BJT – Transistor biasing and bias circuits – operating point – transistor modelling – 'h' parameters – Analysis of low frequency transistor amplifier circuits for CE– CB and CC configuration – FET biasing and bias circuits – FET small signal model – Analysis of common drain and common source amplifier configuration.

Unit III – Large Signal Amplifiers

Amplifier types – Class A amplifier – Series fed and transformer coupled – Class B and Class AB amplifiers – Conversion efficiency – Amplifier distortion – Class C amplifier.

Unit IV

Feedback Amplifiers: Feedback concept, general characteristics of negative feedback amplifiers, Types of feedback, comparison of parameters.

Oscillators: Barkhausen Criterion- Hartley, Colpitts and Wein bridge oscillators, crystal oscillator - Frequency stability.

Unit V

Operational Amplifier: Introduction to op-amp, Characteristics of op-amp. Differential and common mode operation, op-amp parameters - Equivalent circuit - Applications : Inverting and non-inverting amplifier, summer, subtractor, differentiator, integrator, comparator, analog multipliers, first order low pass and high pass active filters, regulators using op-amp.

Text Books

1. Jacob Millman and C. Halkias, Satya brata Jit, Electronic Devices and circuits, Second edition, McGraw Hill Publications, 2007.
2. Jacob Millman and Arvin Grabel, Micro-Electronics, McGraw Hill, Fifth edition, 2008.

Reference Books

1. Robert L.Boylestad and Louis Neshelsky, Electronic devices and circuit theory, Prentice - Hall India, 2008.

IT T33 PRINCIPLES OF PROGRAMMING LANGUAGES

Unit I

Introduction: Characteristics of programming Languages, Factors influencing the evolution of programming language, Development in programming methodologies, desirable features and design issues.

Programming Language processors: Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding time.

Unit II

Elementary and structured data type: Data object variables, constants, data types, elementary data types, declaration, assignments and initialization, enumeration, characters string.

Structured data type and objects: Specifications of data structured types, vectors and arrays, variable size data structure, pointers and programmer constructed data structure, Set files.

Imperative Languages: Block structure, Scope rules, Parameter Passing, Construct like co-routines, Tasks etc.

Unit III

Object Oriented Languages: The class notion- Information hiding and data abstraction using classes, derived classes and inheritance, Polymorphism, Parameterized types.

Unit IV

Functional Language: Functional programming concepts – Referential transparency, Types, Type systems, Name, bindings, environment and scope, Recursive functions, Polymorphic functions, Type variables, High order functions, Curried functions, Lists and programming with lists, Definition of new user defined types in ML, Abstract data types, Evaluation methods.

Unit V

Logic Languages: Review of predicate logic, Clause form, logic, Logic as a programming language, Unification algorithm, Abstract interpreter for logic programs, Theory of logic programs, SLD resolution, Negation as failure extension.

Text Books

1. Terrence W. Pratt, Marvin V. Zelkowitz, Programming Languages: Design and Implementation, Prentice Hall, 2000
2. Daniel P. Friedman, Mitchell Wand, Christopher Thomas Haynes: Essentials of Programming Languages, The MIT Press 2001.
3. Allen B. Tucker, Robert Noonan, Programming Languages: Principles and Paradigms, TMH, 2006.

Reference Books

1. John C. Mitchell: Concepts in Programming Languages, Cambridge University Press 2002.
2. Benjamin C. Pierce: Types and Programming Languages, The MIT Press 2002.
3. Michael L. Scott: Programming Language Pragmatics, Morgan Kaufmann Publishers 2005.
4. B. Stroustrup, The C++ programming language, Addison-Wesley, 2000.
5. E Horowitz, Fundamental of Programming Languages, Galgotia, 1984.
6. M. Hennessey, The Semantics of Programming Languages, John Wiley, 1990.
7. Ravi Sethi: Programming Languages: Concepts and Constructs, 2nd ed., Addison-Wesley 1996.

IT T34 DIGITAL SYSTEM DESIGN

Unit I – Number Systems and Boolean Algebra

Revision of RTL, DTL, I^2L, TTL, ECL, MOS, CMOS logic families-Binary number systems and conversion-Binary arithmetic-Binary codes-Boolean algebra-Basic operations-Basic Theorems-Boolean functions-Canonical forms-Simplification of Boolean functions-Karnaugh maps-Tabulation method.

Unit II – Combinational Logic

Adders – subtractors – code converters – binary parallel adder –decimal adder – magnitude comparator – encoders – decoders – multiplexers – demultiplexers- Binary Multiplier – Parity generator and checker.

Unit III – Sequential Logic I

Sequential circuits: latches – flip flops – analysis of clocked sequential circuits – state reduction and assignments.

Registers and Counters: Registers – shift registers – ripple counters – synchronous counters – ring counters – up/down counters – modulus counters.

UNIT IV - Sequential Logic II

Memory and Programmable Logic: Random Access Memory – memory decoding – error detection and correction – Read Only Memory – Programmable Logic Arrays – Programmable Array Logic.

Asynchronous Sequential Logic : Analysis procedure – circuits with Latches – Design procedure – Reduction of state and Flow tables – Race-Free state assignment – Hazards.

UNIT V -Introduction to Verilog Hardware Description Language

Introduction – HDL for combinational circuits – Sequential circuits – Registers and counters – HDL description for binary multiplier.

Text Book

1. M. Morris Mano, Digital Design, 4th edition, Prentice-Hall of India Pvt.Ltd., 2006.

Reference Books

1. Thomas L.Floyd, R.P.Jain, Digital Fundamentals, 10th edition, Pearson Education, 2008.
2. Leach Malvino, Digital Principles and Applications, 5th edition, Tata McGraw Hill, 2005.
3. Charles H. Roth, Fundamentals of Logic Design, 5th edition, Thomson Brooks/cole. 2003.
4. Thomas C Bartee, Computer Architecture and Logic Design, McGraw Hill, Singapore, 2002.
5. T. R. Padmanabhan, Design through Verilog HDL, Wiley-IEEE Press, 2003.

IT T35 DATA STRUCTURES

Unit I - Basics

Primitive And Abstract Data Types: Data types – abstract data type – data structures – classification.

Sorting And Searching Techniques: Sorting algorithms – Insertion sort- selection sort – shell sort- bubble sort – quick sort – heap sort- merge sort – radix sort – searching – linear search – binary search – indexed search techniques.

Unit II – Lists

Array implementation – linked list – doubly linked list – circular linked list – multi linked lists – applications of linked lists – representation of polynomials and sparse matrices.

Unit III - Stacks and Queues

Stack ADT – array and linked implementation of stacks – queue ADT – array and linked list implementation of queues – application of stacks and queues –expression evaluation - priority queues – double ended queues

Unit IV - Non-Linear Data Structures

Binary tree – array and linked implementation of binary trees – application of trees – tree traversals – graphs – representation – breadth first search – depth first search – spanning trees – application of graphs

Unit V - Advanced Search Techniques

Binary tree indexing – binary search tree – B-tree indexing – B+ trees – Trie indexing – AVL trees - Hash table – hash functions – collision resolution and open addressing

Text Books:

1. Mark Allen Weiss, Data structures and algorithm analysis in C, Pearson Education, 2007
2. Yedidyah Langsam, Moshe J Augenstein and Aaron M Tanenbaum, Data Structures using C and C++, Prentice Hall of India, 2006.

Reference Books:

1. Robert L. Kruse, Clovis L.Tondo and Bruce P.Leung, Data Structures and Program Design in C, Prentice Hall of India, 2007.
2. G.A.V.Pai, Data Structures and Algorithms – Concepts, Techniques and Applications, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
3. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data structures, Galgotia Publications, 2nd Edition, New Delhi, 2001.
4. Jean Paul Treblay and Paul G.Sorenson, An Introduction to data structures with applications, 2nd edition, Tata McGraw-Hill, 2001.
5. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. Data Structures and Algorithms. Addison Wesley, 1983.

IT T36 COMPUTER ORGANIZATION AND ARCHITECTURE

Unit I - Basic Computer Organization and Design

Instruction Codes – Computer Registers – Computer Instructions – Computer Instructions – Timing and Control – Instruction Cycle – Memory reference Instructions - Input – Output and Interrupt Design of Basic Computer – Design of Accumulator logic.

Unit II

Micro programmed Control: Control Memory-Address sequencing- Micro program Example – Design of control unit.

Processor Organization: general register organization – stack organization – instruction formats – addressing modes – data transfer and manipulation – program control.

Unit III - Memory Organization

Memory hierarchy – main memory – auxiliary memory –Associate memory – Cache memory – Virtual memory.

Unit IV - Input-Output Organization

Input-output interface – asynchronous data transfer – modes of transfer – priority interrupt – DMA – IOP – serial communication.

Unit V - Parallel Processing

Multiple processor organizations – Symmetric Multi processors – Cache coherence and MESI protocol – Clusters – Non Uniform Memory Access – Vector Computation.

Text Books

1. M. Morris Mano, Computer System Architecture, 3rd edition, Prentice-Hall of IndiaPvt. Ltd., 1999.
2. William Stallings, Computer Organization and Architecture, 7th edition, Prentice-Hall of India Pvt. Ltd., 2005.

Reference Books:

1. Carl Hamacher, Zvonko G. Vranesic, Safwat G. Zaky, Computer Organization, 5th edition, McGraw-Hill, 2001.
2. John P.Hayes, Computer Architecture and Organisation, McGraw Hill, 1998.
3. P.Pal Chaudhuri, Computer Organization and Design, *2nd* edition, Prentice-Hall of India Pvt. Ltd., 2002.
4. Vincent P. Heuring ,Harry F. Jordan, Computer System Design and Architecture, 2nd edition, Prentice Hall of India Pvt. Ltd, 2003.

IT P31 ELECTRONIC CIRCUITS LAB

1. VI characteristics of semiconductor diodes
2. Diode clipping and clamping circuits
3. Characteristics of CB transistor configuration
4. Input and Output characteristics of CE transistor configuration
5. Characteristics of FET

   Determination of drain resistance, mutual conductance and amplification factor
6. Feedback amplifier

   To determine the frequency response with and without feedback
7. Hartley oscillator and Wein-bridge oscillator
8. Class B push-pull power amplifier
9. Applications of OP-Amps

   Adder, Subtractor, Integrator and differentiator
10. Active low pass and high pass filters using OP-AMP

IT P32 DIGITAL LAB

1. Implementation of logic circuits using gates
    . Full adder/full subtractor
    . Implementation of logic functions using universal gates only
    . Code converters
    . Parity generator and Checker
    . Design of priority encoder
    . Implementation of Boolean functions using MUX
    . Design of decoder, Demultiplexer.

2. Implementation of circuits using MSI
    . Synchronous counters
    . Asynchronous counters
    . Binary multiplier
    . Decimal Adder
    . Universal shift register
    . Design of Arithmetic unit

3. Interface experiments with MSI
    . Design of ALU
    . Interface of ALU with memory

4. Design and Implementation of combinational circuits using Verilog Hardware Description Language (VHDL)

    Combinational circuits – Adder/ Subtractor, Binary multiplier
    Sequential circuits – Flip flops, counters.

IT P33 DATA STRUCTURES LAB

1. Implementation of Sorting techniques
2. Implementation of Searching techniques
3. Implementation of stack and queue operations using linked list and array.
4. Expression evaluation
5. Polynomial addition
6. Sparse matrix addition
7. Binary tree representation and traversal techniques
8. Binary search trees
9. Graph representation and traversal techniques
10. Single source shortest path algorithm
11. Hashing and collision resolution techniques
12. AVL Trees

MA T41 DISCRETE MATHEMATICS AND GRAPH THEORY

Unit I

Connectives, Statement formulae, Equivalence of Statement formulae, Functionally complete set of connectives-NAND and NOR connectives, implication, Principal conjunctive and disjunctive normal forms

Unit II

Inference calculus-Derivation process-Conditional proof-Indirect method of proof- Automatic theorem proving-Predicate calculus

Unit III

Partial ordering-Lattices-Properties-Lattices as algebraic system-sub lattices-Direct product and homomorphism-Special lattices-Complemented and Distributive lattices

Unit IV

Graphs-Applications of graphs-degree-pendant and isolated vertices-isomorphism-sub graphs-walks-paths and circuits- connected graphs –Euler graphs-operations on graphs- More on Euler graphs –Hamilton paths and circuits-complete graph

Unit V

Trees-properties of Trees-Pendant vertices in a Tree-Distance and Center in a Tree-rooted and binary trees-spanning trees-Fundamental Circuits-Distance between spanning trees shortest spanning trees-Kruskal algorithm

Text Books

1. J.P.Tremblay and R.Manohar, Discrete Mathematical Structures with applications to Computer science, Tata McGraw-Hill Publishing company pvt. Ltd., New Delhi, 2002.

2. Narsingh Deo, Graph Theory with applications to Engineering and Computer science, Prentice-Hall of India pvt. Ltd., New Delhi, 1987.

Reference Books

1. Kenneth H.Rosen, Discrete Mathematics and its Applications, Fifth edition, Tata McGraw-Hill Publishing company pvt. Ltd., New Delhi, 2003.

2. C.L.Liu, Elements of Discrete Mathematics, Second Edition, McGraw-Hill Book Company, New York 1988.

3. F.Harary, Graph Theory, NarosaPublishing House, New Delhi –Chennai-Mumbai, 1988.

4. Douglas B.West, Introduction to Graph Theory, Second Edition (Indian) Pearson Education Singapore) Pvt.Ltd, 2002.

IT T42 COMMUNICATION ENGINEERING – I

Unit I - Amplitude Modulation Systems

External and internal noise - Noise figure - Need for modulation - Amplitude modulation – Frequency spectrum of AM wave – Representation of AM – Power relation – Generation of AM waves – Diode and balanced modulators – Suppression of carrier – SSB and DSB -Demodulation of AM waves – Linear detectors – Synchronous and envelope detectors.

Unit II - Angle Modulation System

Frequency modulation and phase modulation – Mathematical representation of FM – Frequency spectrum of FM wave – Generation of FM wave – Direct and Indirect methods – Demodulation of FM waves – Slope detector –Balanced slope detector – Foster-Seeley discriminator – Ratio detector.

Unit III -Transmitters and Receivers

Low level and high level AM transmitter – FM transmitter – Super heterodyne AM receiver – Receiver characteristics - Communication receiver – Diversity reception – FM receivers.

Unit IV - Pulse and Digital Modulation Systems

Principles of pulse modulation – sampling theorem, PAM – PWM – PPM– Conversion of PWM wave to PPM wave – Generation of PAM, PPM and PWM waves – Demodulation of PAM, PWM, PPM – An introduction to digital modulation systems – PCM, ASK, FSK and PSK.

Unit V - Antennas (Qualitative analysis)

Basic antenna operation, Definition of antenna parameters -radiation pattern, radiation resistance, directive and power gain, directivity, beam width, polarization and bandwidth- UHF and microwave antenna types- Dipole antenna, horn and its types, parabolic reflector, micro strip antenna, Yagi Uda and array antenna.

Text Books

1. Kennedy Davis, Electronic Communication Systems, Tata Mc Graw Hill Publishing Company Limited, New Delhi, 2008.
2. Wayne Tomasi, Electronic Communication Systems, Pearson education Private Limited, Delhi, 2004.

Reference Books

1. Roddy D and Coolen J, Electronic Communications, Prentice Hall of India Private Limited, 4th edition, 2007.

IT T43 MICROPROCESSOR AND APPLICATIONS

Unit I - Introduction To Microprocessors

Concept and need for microprocessors – evolution - general architecture - control unit – internal registers – arithmetic and logic unit – state transition – architecture of 8085 and 8086 – timing and sequencing.

Unit II - Instruction Set And Programming

Addressing modes – instruction set summary of 8085 – overview of 8086 instruction set – assembly language programming: arithmetic and logic – code conversion – counters and delay routines - stacks and subroutines.

Unit III -Interrupts And DMA

Data transfer techniques – interrupt structure of 8085 – overview of 8086 interrupts – interrupt vectors – interrupt service subroutines – priority – multiple interrupts – applications – real time clock - DMA data transfer – Burst and Cycle stealing mode.

Unit IV - Memory & I/O Interfacing

Types of memory – memory mapping – address decoders – dynamic RAM interfacing – concept of I/O map – types – I/O decode logic – interfacing key switches and LEDs – programmable peripheral interface 8255 – programmable interval timer 8253 – programmable interrupt controller 8259 – programmable DMA controller 8237.

Unit V - Serial Communication And Microprocessor Applications

Concept of Serial Communication – 8251 USART – RS232C interface – traffic light control – data acquisition system – temperature monitoring system – robot manipulator arm.

Text Books

1. Ramesh S.Gaonkar, Microprocessor Architecture, Programming and Applications with 8085, Penram Publications, 2002.
2. A. K. Ray and Bhurchandi , Advanced Microprocessors And Peripherals, Tata McGraw Hill, 2000.

Reference Books

1. Douglas V.Hall, Microprocessors and Interfacing Programming and Hardware, Tata Mc Graw Hill, 2003.
2. Ajit Pal, Microprocessors Principles & Applications, Tata Mc Graw Hill, 2001.
3. Barry B. Brey, The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386 and 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III Pentium IV – Architecture, Programming and Interfacing, 7th edn., PHI, 2008.

IT T44 DESIGN AND ANALYSIS OF ALGORITHMS

Unit – I

Introduction: Efficiency of algorithms – average and worst case asymptotic notation – the order of - other asymptotic notations.

Analysis Of Algorithms: Analyzing control structures – solving recurrences – homogeneous recurrences – inhomogeneous recurrences.

Unit – II

Divide And Conquer Method: Binary search – merge sort – quick sort – strassen's matrix multiplication.

Greedy Method: Knapsack problem – Prim's algorithm – Kruskal's algorithm – Dijkstra's algorithm – Huffman trees.

Unit – III

Dynamic Programming: Principle of optimality – computing binomial co-efficient – Warshall's and Floyd's algorithms – optimal binary search tree – knapsack problem – traveling salesman problem

Unit – IV

Backtracking: n queen's problem – sum of subsets – graph coloring – Hamiltonian cycle – knapsack problem

Unit – V

Branch And Bound: Knapsack problem – traveling salesman problem – assignment problem

Introduction To NP Completeness: easy vs hard – the class NP – NP complete problems

Text Books

1. Gilles Brassard and Paul Brately, Fundamentals of Algorithms, Prentice Hall of India, 1997.
2. Anany Levitin, Introduction to Design and Analysis of Algorithms, Pearson Education Inc., 2005.
3. Ellis Horowitz, Sartaj Sahni and S. Rajasekaran, Fundamentals of Computer Algorithms , Galgotia Publications, 2nd Edition, New Delhi, 2003.

Reference Books

1. Aho.A.V, Hopcroft.J.E and Ullman.J.D, Design and analysis of Algorithms, Pearson education, 3rd edition, 2000.
2. Mark Allen Weiss, Data structures and algorithm analysis in C, Pearson Education, 2nd Edition, 2003
3. Thomas.H.Cormen, Charles E. Leiserson, Ronald L.Rivest, Introduction to Algorithms, Prentice Hall of India Pvt. Ltd, 1998.

IT T45 OPERATING SYSTEMS

Unit I

Introduction: Mainframe Systems –– Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems - Real Time Systems –– Hardware Protection – System Components – Handheld Systems -Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication.

Unit II

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

Unit III

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 - Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing.

Unit IV

File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection - 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.

Unit V

Linux overview – Kernel Architecture – Process, memory, file and I/O management – Inter-process communication and synchronization – Security

Windows XP - System Architecture – System management mechanisms – Process, thread, memory and file management – I/O subsystem – Interprocess communication - Security

Text Books

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, Operating System Concepts, Seventh Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2005.
2. Harvey M. Deitel, Paul J. Deitel, and David R. Choffnes, Operating Systems, Third Edition, Prentice Hall, 2003.

Reference Books

1. William Stallings, Operating System, Prentice Hall of India, 6th Edition, 2009.
2. Harvey M. Deitel, Operating Systems, Second Edition, Pearson Education Pvt. Ltd, 2002.
3. Gary J. Nutt, Operating Systems: A Modern Perspective, Second Edition, Addison Wesley, 2001.
4. A. Tannenbaum. Modern Operating Systems. 2nd Edition, Prentice Hall, 2001.
5. Charles Crowley , Operating System, A Design-Oriented Approach, Tata McGraw-Hill, 1999

IT T46 OBJECT ORIENTED DESIGN AND PROGRAMMING

Unit I

Limitations in structured programming-Characteristics of Object Oriented Language – data types-Classes – Objects- Operator overloading – Inheritance.

UNIT II

Polymorphism – I/O operations-Files-Templates – Exception Handling – Container Classes-Strings.

Unit III

Object Orientation – System development – Review of objects - inheritance - Object relationship – Dynamic binding – OOSD life cycle – Process – Analysis – Design – prototyping – Implementation – Testing- Overview of Methodologies.

Unit IV

OMT – Booch methodology, Jacobson methodology – patterns – Unified approach –UML – Class diagram – Dynamic modeling. Use case model – Creation of classes –Noun phrase approach – responsibilities – Collaborators – Object relationships – Super-Sub class – Aggregation.

Unit V

OO Design axioms – Class visibility – refining attributes – Methods –Access layer –OODBMS – Table – class mapping view layer. Quality assurance testing – Inheritance and testing – Test plan – Usability testing – User satisfaction – Testing.

Note: Unit I & II deals with C++

Text Books

1. E.Balaguruswamy, Object Oriented Programming with C++, II edition, TMH, 2001.
2. K.R.Venugopal,Rajkumar and T.Ravishankar, Mastering C++, TMH, 2007.
3. Ali Bahrami, Object Oriented System Development, McGraw-Hill International Edition, 1999.
4. Stephen R. Schach, “Introduction to Object Oriented Analysis and Design”, Tata McGrawHill, 2003.

References

1. Bjarne Stroustrup , The C++ Programming Language, (3rd and Special Edition) Addison Wesley, 2000
2. Simon Benett, Steve McRobb, Ray Farmer, Object Oriented System Analysis and Design Using UML, McGrawHill, 1999.
3. Timothy C. Lethbridge, Robert Laganiere, Object Oriented Software Engineering McGrawHill, 2001.
4. Martin Fowler, Kendall Scott, UML Distilled, 2nd edition, PHI / Pearson education, 2002.
5. Richard C Lee, William M Tepfenhart, UML and C++ - A practical guide to object oriented development, PHI, 1997.
6. Grady Booch. Object-Oriented Analysis and Design With Applications, 2nd Ed. Benjamin Cummings, 1994.

IT P41 OBJECT ORIENTED PROGRAMMING AND ALGORITHMS LAB

1. Programs using C++ concepts like
    - classes & objects
    - Constructors & Destructors
    - Function Overloading
    - Inheritance
    - Operator overloading
    - Polymorphism & virtual functions
    - I/O streams
    - File operations.
    - Templates
    - Exception handling (to be included in all problems)
    - String operations

2. Quick sort using divide and conquer
3. Merge sort using divide and conquer
4. Prim's algorithm
5. Kruskal's algorithm
6. Dijikstra's algorithm
7. Optimal binary search tree
8. TSP using dynamic programming.
9. N-queens problem using backtracking.
10. Sum of subsets using backtracking.
11. Graph coloring using backtracking.
12. Hamilton Cycle using backtracking.
13. Knapsack using branch and bound.

IT P42 MICROPROCESSOR LAB

1. Study of 8085 Microprocessor trainer kit
2. Assembly language programming: arithmetic operations
3. Assembly language programming: block operations
4. Assembly language programming: code conversions
5. Assembly language programming: sorting and searching methods
6. Digital clock simulation
7. Printer interfacing
8. Serial communication within a trainer kit
9. Serial communication between kit to kit
9. Elevator simulation
10. Traffic light control
11. Music synthesizer
12. ADC & DAC interfacing
13. Stepper motor and DC motor interfacing
14. 8086 assembly language programming using MASM

IT P43 OPERATING SYSTEMS LAB

1. Study of basic Unix / Linux commands.
2. Shell Programming.
3. Programs using the following system calls of Unix / Linux operating system:
   fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Programs using the I/O system calls of UNIX operating system (open, read, write, etc).
5. Simulations of Unix / Linux commands like ls, grep, etc.
6. Simulation of scheduling algorithms (CPU and Disk).
7. Implementation of synchronization problems using Semaphore.
8. Simulation of basic memory management schemes.
9. Simulation of virtual memory management schemes.
10. Simulation of file systems.

PE P44 PHYSICAL EDUCATION

Physical Education is compulsory for all the Undergraduate students

1. The above activities will include games and sports / extension lectures.
2. In the above activities, the student participation shall be for a minimum period of 45 hours.
3. The above activities will be monitored by the Director of Physical Education.
4. Pass /Fail will be determined on the basis of participation, attendance, performance and behavior. If a candidate Fails, he/she has to repeat the course in the subsequent years
5. Pass in this course is mandatory for the award of degree.

IT T51 COMMUNICATION ENGINEERING II

UNIT I –Microwave communication systems

Introduction to microwave components, wireless channel characteristics, Microwave communication systems: advantage, block diagram of a microwave radio system, microwave radio stations- Terminal station and repeater station.

Unit II - Satellite Communication systems

Satellite Orbits, launch vehicles, look angles, satellite parameters, satellite link model and link budget calculations, satellite used for mobile networks and personal communication systems- GPS services.

UNIT- III – Spread Spectrum Communication

Spread spectrum technologies - spreading techniques - PN sequences - Direct sequence spread spectrum systems - Frequency hopping spread spectrum systems - Hybrid systems - Demodulation schemes - RAKE receivers - Use of spread spectrum with code division multiple access

UNIT IV – Cellular Mobile Communication

Cellular concept, basic cellular concept and its operation, uniqueness of mobile radio environment-Performance metrics in cellular system-Elements of cellular mobile radio-Handoff- Frequency management and channel assignment- Introduction to various cellular standards like AMPS, GSM, GPRS, IS-95A, IS-95B, CDMA-2000 and WCDMA.

UNIT V – Fiber Optical Communication Systems

Need for fiber optics, introduction to optical fiber, principle of light transmission through a fiber, fiber characteristics and classification, various fiber losses- Light sources and photo detectors-Block diagram of a fiber optic system- Power budget analysis for a optical link-Recent applications of fiber optics.

Text Books

1. Kennedy Davis, Electronic Communication systems, Tata McGraw Hill Publishing Company Limited, New Delhi, 2008.
2. Wayne Tomasi, Electronics Communication systems, Pearson Education Private Limited, 5th edition, 2004.

Reference Books

1. D.Roddy, Satellite Communication, Prentice Hall, 2006.
2. T.Pratt and C.W.Bostain, Satellite Communication, John wiley and Sons, 2nd edition, 2006.
3. William C.Y.Lee, Mobile Cellular Telecommunication Systems, McGraw Hill, International Edition, 2nd edition, 2006.
4. Gerd Keiser, Optical fiber Communications, McGraw Hill International Edition, 4th edition, 2006.

IT T52 SOFTWARE ENGINEERING

Unit I

Introduction: The evolving role of Software – Software characteristics, Software Process: Software process models - The linear sequential model - The prototyping model - The RAD model - Evolutionary software process models - The incremental model - The spiral model - Software applications - Software myths.

Planning and Estimation: The Project Planning Process-Software Project Estimation- LOC based-FP- Based-Estimation for Object Oriented Project.

Unit II

System Engineering: Requirements elicitation - Need for SRS - Requirement Process- Problem Analysis – Informal Approach - Cardinality and modality – Entity / Relationship diagram - Data Flow Modeling - Object-Oriented Modeling - Prototyping - Requirements Specification - Characteristics of an SRS - Components of an SRS - Specification - Structure of a Requirements Document - Functional Specification with Use Cases - Extensions - Developing Use Cases - Requirements analysis and negotiation - Requirements validation - Requirements management – Joint Application Development.

Unit III

Design Concepts And Principles: Refinement-Modularity - Software architecture - Architectural design - Structural partitioning – Functional Independence –Component and Connector View - Architecture Styles for C&C View - Pipe and Filter - Shared-Data Style - Client-Server Style - Deployment View and Performance Analysis -Documenting Architecture Design - Evaluating Architectures - The user interface design process

Object-Oriented analysis and design

Unit IV

Testing Techniques: Software testing fundamentals - Test case design - White box testing - Basis path testing - Control structure testing - Black box testing - Testing for specialized environments, Testing strategies - Verification and validation - Unit testing - Integration testing - Validation testing - The art of debugging.

Unit V

Implementation and Integration: Implementation Phase – Integration Phase - *System testing* – Maintenance Phase.

Software Quality Assurance: Quality concepts - cost of quality - Software Quality Group (SQA)-Roles and responsibilities of SQA group- Formal Technical reviews- Quality standards.

Text Books

1. Roger. S. Pressman, Software Engineering – A Practitioner's Approach, sixth Edition, McGraw Hill International Edition, Singapore, 2006.
2. Jalote P, An Integrated Approach to Software Engineering, third edition, Narosa Publishers, New Delhi, 2005.

Reference Books

1. Ali Behforooz, Frederick J Hudson, Software Engineering Fundamentals, second edition, Oxford University Press, Noida, 2003.
2. Fairley R, Software Engineering Concepts, second edition, Tata McGraw Hill, New Delhi, 2003.
3. Ian Sommerville, Software Engineering, 7th Edition, Pearson Education, New Delhi, 2004.
4. Shari Lawrence Pfleeger, Software Engineering Theory and Practice, second Edition, Pearson Education, New Delhi, 2001.
5. Stephen R Schach, Classical and Object-Oriented Software Engineering – With UML and C++, McGraw Hill, New Delhi, 2002.

IT T53 AUTOMATA LANGUAGES AND COMPUTATION

Unit I

Finite Automata and Regular Expressions: Deterministic and Non-Deterministic Finite Automata, Finite Automata with ε-moves, regular expressions – equivalence of NFA and DFA, two-way finite automata, Moore and Mealy machines, applications of finite automata.

Unit II

Regular Sets and Context Free Grammars: Properties of regular sets, context-Free Grammars – derivation trees, Chomsky Normal Forms and Greibach Normal Forms, ambiguous and unambiguous grammars; minimization of finite automata.

Unit III

Pushdown Automata and Parsing Algorithms: Pushdown Automata and context-free languages; Top-down parsing and Bottom-up parsing; properties of CFL; Applications of pumping lemma, closure properties of CFL and decision algorithms.

Unit IV

Turing machines: Turing machines(TM) – computable languages and functions – tuning machine constructions – storage in finite control – variations of TMs – recursive and recursive enumerable languages.

Unit V

Introduction to Computational Complexity: Time and Space complexity of TMs – complexity classes – introduction to NP-Hardness and NP-Completeness.

Text Book

1. John E. Hopcroft and Jeffrey D. Ullman, Introduction to Automata Theory, Languages and Computation, Narosa Publishers, 2002.

Reference Books

1. Michael Sipser, Introduction to the Theory of Computations, Brooks/Cole Thomson Learning, 1997.
2. John c. Martin, Introduction to Languages and the Theory of Computaiton, Tata McGraw-Hill, 2003.

IT T54 JAVA AND INTERNET PROGRAMMING

UNIT I

Introduction to Object Oriented Programming – Java on the Internet – Multithreading and persistence – Java keywords and flow control – Garbage collection – packages- Final declaration – Interfaces and inner classes – Java I/O classes – Run time type identification.

UNIT II

Introduction to Applets – How it differs from application –building applet code and Execution – Life cycle – Applet Tag – Adding Applet to HTML file – Passing Parameters to Applet – Displaying Numerical Values – Getting Input from the User – Debugging.

UNIT III

Foundations for Internet Programming: An overview of Internet Programming - WWW - HTML – forms – frames – tables – web page design - JavaScript introduction – control structures – functions – arrays – objects – simple web applications.

UNIT IV

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

UNIT V

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

TEXT BOOKS

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

2. E. Balagurusamy, Programming with Java – A Primer – 3 Edition, Tata McGraw Hill, 2007.

REFERENCES

1. R. Krishnamoorthy & S. Prabhu, Internet and Java Programming , New Age International Publishers, 2004.
2. Thomno A. Powell, The Complete Reference HTML and XHTML, fourth edition, Tata McGraw Hill, 2003.

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

IT T55 SYSTEM SOFTWARE AND COMPILERS

Unit I - Introduction to System Software and Machine Structure
System programs – Assembler – Compiler – Interpreter- Operating system-Machine Structure – instruction set and addressing modes.

Unit II
Assemblers: Basic assembler functions- machine – dependent and machine independent assembler features - Assembler design – Two-pass assembler with overlay structure- one – pass assembler and multi - pass assembler.
Interpreters: Virtual Machine concept- Java Byte Codes- Microsoft Intermediate Language

Unit III - Loaders and Linkers
Basic loader functions, machine – dependent and machine – independent loader features. Loader design – Linkage editors, dynamic linking and bootstrap loaders.

Unit IV - Compilers
Structure- Lexical Analyzers- Designing lexical analyzers-Syntactic specification of programming languages- Parsing Techniques-SLR.

Unit V
Intermediate code generation- Parse trees-Three address codes-quadruple and triples- Code optimization –principal sources-loop optimization-DAG representation of basic blocks.

Text Books

1. Leland L Beck, System Software, An Introduction to System Programming, Pearson Education, 13th Indian Reprint, New Delhi, 2003.
2. John J Donovan, Systems Programming, Tata McGraw Hill Company, New Delhi, 2004.
3. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Compilers: Principles, Techniques, & Tools, 2nd edition Addison-Wesley, 2006.

Reference Book

1. Dhamdhere D M, Systems Programming and Operating Systems, Tata McGraw Hill Company, New Delhi, 2002.
2. David Galles, Modern Compiler Design, Addison Wesley, 2004.

IT T56 INFORMATION CODING TECHNIQUES

UNIT I

Information entropy fundamentals: Information – entropy - properties of information and entropy - relation between information and probability - mutual and self information - coding theory- code efficiency and redundancy - Shannon's theorem - construction of basic codes-Shannon and Fanon coding, Huffman coding – arithmetic coding.

UNIT II

Data and Voice Coding: Lossless predictive - Run-length - Ziv-Lempel coding - voice coding - modulation - linear predictive coding - silence coding and sub-band coding.

UNIT III

Image and video compression: Quantization - JPEG standards - motion compensation - MPEG-1 - MPEG-2 - MPEG-4 standards.

UNIT IV

Error Control Coding: Linear Block Codes for Error Correction - Cyclic Codes - Bose-Choudhuri Hocquenghem codes - Convolution Codes - Trellis Coded Modulation.

UNIT V

Cryptography: Overview of encryption techniques - symmetric cryptography - Data Encryption Standard (DES) - International Data Encryption Algorithm (IDEA) - RC Ciphers - Public-key algorithm - RSA algorithm - Pretty Good Privacy - One-way Hashing.

TEXT BOOKS

1. Ze-Nian Li and Mark S. Drew, Fundamentals of Multimedia, Pearson Education, 2004.
2. J. S. Chitode, Information Coding Techniques, Technical Publications, 2008.
3. Ranjan Bose, Information theory, coding and cryptography, Tata McGraw Hill, 2002.
4. Viterbi, Information theory and coding, McGraw Hill, 1982.

REFERENCE BOOKS

1. John G. Proakis, Digital Communications, 2nd Edition, McGraw Hill, 1989.
2. K. Sayood, Introduction to Data Compression, Morgan Kaufmann Publishers, 2000.

IT P51 COMMUNICATION ENGINEERING LAB

1. Amplitude modulation and demodulation
2. Frequency modulation and demodulation
3. PCM encoder and decoder
4. Generation of PAM, PWM and PPM
5. Generation of ASK, FSK and PSK
6. Simulation analysis of handoff performance in cellular mobile systems
7. Simulation of satellite link budget analysis
8. Simulation of fiber optic link budget analysis
9. Simulation of various propagation models (Outdoor and Indoor)
10. Simulation of antenna radiation pattern(Horn, Parabolic reflector)

IT P52 VISUAL PROGRAMMING LAB

VISUAL_BASIC

1. Simple programs with control structures using form and intrinsic controls
2. Adding menus to forms
3. Creating dialog boxes with various options
4. MDI applications
5. Writing code for various keyboard and mouse events
6. OLE container control
7. Simple programs with classes and objects
8. Data_access through Data control and DAO.

VISUAL C++

1. creating applications with App wizard
2 Simple Winconsole application.
3 Working with MFC
4 Creating simple SDI and MDI applications
5. Exception handling (to be considered in all programs)
6. Loading - Editing - Adding resources - Linking resources to applications
7.Threads
8. OLE
9. ODBC
10. DLL's

IT P53 JAVA AND INTERNET PROGRAMMING LAB

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box

2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout

3. Write programs in Java to create applets incorporating the following features:
   - Create a color palette with matrix of buttons
   - Set background and foreground of the control text area by selecting a color from color palette.
   - In order to select Foreground or background use check box control as radio buttons
   - To set background images

4. Write a java program to simulate a scientific calculator.

5. Develop a simple real life application program to illustrate the use of Multi Threads.

6. Write a java program to create simple chat application with Datagram Sockets and Datagram Packets.

7. Write programs in Java using Servlets:
   - To invoke servlets from HTML forms
   - To invoke servlets from Applets

8. Write programs in Java to create three-tier applications using servlets
   - for conducting on-line examination.
   - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

9. Create a web page with the following using HTML
   i) To embed a map in a web page
   ii) To fix the hot spots in that map
   iii) Show all the related information when the hot spots are clicked.

10. Create a web page with the following.
   i) Cascading style sheets.
   ii) Embedded style sheets.
   iii) Inline style sheets.
   iv) Use our college information for the web pages.

HS P54 GENERAL PROFICIENCY-I

Unit I - Art Of Communication

Verbal and Non-verbal Communication – Barriers to Communication – Importance of Body Language – Effective Listening – Feedback

Unit II - Introduction to Soft Skills

Attitude – Self-Confidence – Leadership Qualities – Emotional Quotient – Effective Time Management Skills – Surviving Stress – Overcoming Failure – Professional Ethics – Interpersonal Skills

Unit III - Writing

Importance of Writing – Written Vs Spoken Language – Formal and Informal Styles of writing – Resources for improving writing – Grammar and Usage – Vocabulary Building – SWOT analysis

Unit IV -Speaking Practice

Dialogue – Telephone Etiquette – Public Speaking – Debate – Informal Discussions – Presentations

Unit V - Aptitude

Verbal and Numerical aptitude

Reference Books

1. Nicholls, Anne. Mastering Public Speaking. Jaico Publishing House,2003.
2. Aggarwal, R.S. Quantitative Aptitude. S.Chand &Co.,2004.
3. Leigh, Andrew and Michael Maynard. The Perfect Leader. Random House Business Books,1999.
4. Whetton .A.David and Kim S. Cameron. Developing Management Skills. Pearson Education, 2007.
5. K.R. Lakshminarayan. Developing Soft Skills. Scitech, 2009.
6. Sherfield M Robert. Developing Soft Skills Pearson Education, 2005.
7. Hair O' Dan, Friedrich W. Gustav and Lynda Dee Dixon. Strategic Communication in Business and the Professions. Pearson Education, 2008.
8. Chaney Lilian and Jeanette Martin. Intercultural Business Communication, Fourth Edition. Pearson Education, 2008.

IT T61 INFORMATION SECURITY

UNIT I -Introduction

Security Trends, OSI security architecture, Security attacks, security services, security mechanisms, - Security System Development Life cycle –Legal, Ethical and Professional issues.

UNIT II-Security Analysis And Logical Design

Risk Management - Identifying and Assessing Risk - Assessing and Controlling Risk. Blueprint for Security - Information Security Policy - Standards and Practices – ISO 17799/BS 7799 - NIST Models - VISA International Security Model - Design of Security Architecture .

UNIT III -Physical Design

Security Technology – Intruders, Malicious software, Firewalls, Scanning and Analysis tools, Content filters.

UNIT IV-Cryptography

Advanced Encryption standard, Principles of public-key cryptosystem, Key management, Message authentication and Hash functions, Digital signatures.

UNIT-V- Biometric Security

Biometrics: Definition-Types of Biometrics- Multi biometrics-Fusion methods-applications.

TEXT BOOKS

1. Michael E Whitman and Herbert J Mattord, Principles of Information Security, Vikas Publishing House, New Delhi, 2003.
2. William Stallings, Crptography and Network security, Principles and Practices, Fourth Edition, Pearson Education, 2006.
3.John D.Wood Ward, Jr.Nicholas M.Orlans and Peter T.Higgm, Biometrics, Dream tech press, 2003.

REFERENCES

1. Micki Krause, Harold F. Tipton, Handbook of Information Security Management, Vol 1-3 CRC Press LLC, 2004.

2. Ron Weber, “Information Systems Control and Audit”, Pearson Education, New Delhi, 2004.

IT T62 INTELLIGENT COMPUTING

UNIT- I

Introduction: History of AI - Intelligent agents – structure of agents and its functions - problem spaces and search- Heuristic Search techniques –Best-first search- Problem reduction-Constraint satisfaction-Means Ends Analysis.

UNIT -II

Knowledge Representation: Approaches and issues in knowledge representation- Knowledge-Based Agent- Propositional Logic –Predicate logic-Unification- Resolution- Weak slot-filler structure – Strong slot-filler structure.

UNIT -III

Reasoning under uncertainty: Logics of non-monotonic reasoning-Implementation- Basic probability notation - Bayes rule – Certainty factors and rule based systems-Bayesian networks – Dempster - Shafer Theory - Fuzzy Logic.

UNIT- IV

Planning and Learning: Planning with state space search-conditional planning-continous planning-Multi-Agent planning. Forms of learning-inductive learning-learning decision trees-Neural Net learning and Genetic learning

UNIT -V

Advanced Topics: Game Playing: Minimax search procedure-Adding alpha-beta cutoffs
Expert System: Representation-Expert System shells-Knowledge Acquisition.
Robotics: Hardware-Robotic Perception-Planning-Application domains

Text Books

1. Elaine Rich and Kevin Knight and Shivashankar B.Nair, Artificial Intelligence, 3rd edition, Tata Mc Graw Hill, 2009.
2. Stuart J.Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Pearson Education Asia, II edition, 2003.
3. N.P.Padhy, Artificial Intelligence and Intelligent Systems, Oxford University Press, 2nd edition, 2005.

Reference Books

1. Rajendra Akerkar ,Introduction to Artificial Intelligence, Prentice hall of India, 2005.
2. Patrick Henry Winston, Artificial Intelligence, 3rd edition Pearson Education, Inc., 2001.

IT T63 DATABASE MANAGEMENT SYSTEMS

Unit I -Introduction

Introduction to Database Systems : Overview – Data Models – Database System Architecture – History of Database Systems. Entity-Relationship Model: Basic Concepts – Constraints – Keys – Design Issues – Entity Relationship Diagram – Weak Entity Sets – Extended E-R Features – Design of an E-R Database Schema – Reduction of E-R Schema to Tables.

Unit II - Relational Model

Structure of Relational Databases – Relational Algebra – Extended - Relational Algebra Operations – Modification of Database – Views – Tuple Relational - Calculus – Domain Relational Calculus. SQL: Background – Basic Structure – Set - Operations – Aggregate Functions – Null Values – Nested Subqueries – Views – Complex Queries –Modification of the database – Joined Relations – Data-Definition Language. Other Relational Languages: Query-by-Example.

Unit III - Integrity and Security

Domain Constraints – Referential Integrity – Assertions –
Triggers – Security and Authorization – Authorization in SQL .
Relational-Database Design: Normalization -first normal form , second normal form, third normal form, Boyce-Codd normal form, fourth normal form.

Unit IV- Storage and File Structures

Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary Storage – Storage Access – File Organization.
Indexing and Hashing: Basic Concepts – Ordered Indices – B+-Tree Index Files – B-Tree Index Files – Static Hashing – Dynamic Hashing.

Unit V- Transactions

Transaction concept – Transaction State – Implementation of Atomicity and Durability – Concurrent Executions – Serializability – Testing for Serializability.
Concurrency Control: Lock-Based Protocols – Timestamp-Based Protocols.
Recovery System: Failure Classification – Storage Structure – Recovery and Atomicity – Log-Based Recovery – Shadow Paging.

Text Book

1. Silberschatz, Korth, Sudarshan, *Database System Concepts*, 4th Edition – McGraw-Hill Higher Education, International Edition 2005.

Reference Books

1. Fred R McFadden, Jeffery A Hoffer, Mary B. Prescott, Modern Database Management, Fifth Edition, Addison Wesley, 2000.
2. Elmasri, Navathe, Fundamentals of database Systems, Third Edition, Addison Wesley, 2000.
3. Jefrey D.Ulman, Jenifer Widom, A First Course in Database Systems, Pearson Education Asia, 2001.
4. Bipin C Desai, An Introduction to Database Systems, Galgotia Publications Pvt Limited, 2001.

IT T64 COMPUTER NETWORKS

UNIT I- Introduction

Introduction To Networks And Communication Media: Uses – Network Hardware- Network Software – Reference Models – Example Networks – Network Standardization.
Basis for data communication - Transmission media – Wireless Transmission – Telephone Systems – Satellite Communication.

UNIT II - Data Link Layer

Data Link Layer design issues – Error Detection and Correction- Methods - Elementary Data Link Protocols – Sliding Window Protocols – Protocol- Verification Methods – Channel Allocation – Multiple Access protocols – IEEE 802 Standards – Bluetooth.

UNIT III - NETWORK LAYER

Network Layer design issues – Routing algorithms – Congestion- Control algorithms – Internetworking – Network Layer in Internet.

UNIT IV - TRANSPORT LAYER

Transport Service – Transport Protocols – Internet Transport- Protocols UDP – TCP - Performance issues.

UNIT V - APPLICATION LAYER

Application Layer design issues – Domain Name System - Electronic Mail – World Wide Web – Multimedia - Other Applications – Network-Security - Basic Cryptography - DES - RSA.

Text Books

1. Andrews S. Tanenbaum, *Computer Networks*, Prentice Hall of India Private Limited, (4th Edition), 2003.

Reference Books

1. Leon Garcia and Widjaja, Communication Networks - Fundamental concepts and key architecture, Tata McGraw Hill, 2001.
2.William Stallings, Data and Computer Communication, Sixth Edition, Pearson Education, 2000.
3.Behrouz A. Forouzan, Data communication and Networking, Tata McGraw-Hill, 2004.
4. Uyless Black, Computer Networks : Protocols, standards and interfaces, Prentice Hall, 1993.

IT P61 DBMS LAB

1. Study of Database Concepts
Relational Model – Table – Operations On Tables –Index – Tablespace – Clusters – Synonym – View –Schema – Data Dictionary – Privilege – Role –Transactions

2. Study of SQL
Primitive Data Types – User Defined data Types – Built-in Functions –Parts of Speech of CREATE, ALTER, DROP, SELECT, INSERT, DELETE, UPDATE, COMMIT, ROLLBACK, SAVEPOINT, GRANT, REVOKE

3. Study of Query Types
Queries involving Union, Intersection, Difference, Cartesian Product, Divide Operations – Sub Queries – Join Queries – Nested Queries –Correlated Queries – Recursive Queries

4. Study of PL/SQL
Blocks, Exception Handling, Functions, Procedures, Cursors, Triggers, Packages.

5. Application
Design and develop any two of the following
• Library Information System
• Logistics Management System
• Students' Information System
• Ticket Reservation System
• Hotel Management System
• Hospital Management System
• Inventory Control
• Retail Shop Management
• Employee Information System
• Payroll System
• Any other Similar System
Clearly mention the scope of the system. Use standard tools for expressing the design of the systems.

IT P62 MINI PROJECT

Students in convenient groups of not more than three members in a group are to take up sample project development activities with the guidelines given below using some of the Computer Aided Software Engineering Tools (CASE):

- Preparing a project – brief proposal including
    - Problem Identification
    - Developing a model for solving the problem
    - A statement of system / process specifications proposed to be developed (Data Flow Diagram)
    - List of possible solutions including alternatives and constraints
    - Cost benefit analysis
    - Time line activities

- A report highlighting the design finalization [based on functional requirements & standards (if any)]
- A presentation including the following
    - Implementation phase (Hardware / Software / both)
    - Testing & Validation of the developed system
    - Learning in the project
- Consolidated report preparation

IT P63 COMPUTER NETWORKS LAB

1. Write a socket Program for Echo/Ping/Talk commands.
2. Create a socket (TCP) between two computers and enable file transfer between them.
3. Write a program to implement Remote Command Execution (Two M/Cs may be used).
4. Write a program to implement CRC and Hamming code for error handling.
5. Write a code simulating Sliding Window Protocols.
6. Create a socket for HTTP for web page upload & Download.
7. Write a program for TCP module Implementation (TCP services).
8. Write a program for File Transfer in client-server architecture using following methods.
    a. Using RS232C
    b. TCP/IP
9. Write a program to implement RMI (Remote Method Invocation).
10. Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
    a. Shortest path routing
    b. Flooding
    c. Link State
    d. Hierarchical
11. Broadcast / Multicast routing.
12. Study of Network Simulators like NS2/Glomosim.

HS P64 GENERAL PROFICIENCY – II

Unit I - Composition Analysis
Technical and Non-Technical Passages (GRE Based) – Differences in American and British English – Analyzing Contemporary issues – Expanding Terminology

Unit II - Writing
Job Application Letter Writing – Resume Writing

Unit III - Oral Skills
Group Discussion – Introduction and Practice – Team Work – Negotiation Skills – Organizing and Attending Meetings – Facing Interviews

Unit IV- Adapting To Corporate Life
Corporate Etiquette – Grooming and Dressing

Unit V - Aptitude
Verbal and numerical aptitude

Reference Books

1. Pushplata and Sanjay Kumar. Communicate or Collapse : A Handbook of Effective Public Speaking, Group Discussions and Interviews. Prentice-Hall, Delhi,2007.
2. Thorpe, Edgar. Course in Mental Ability and Quantitative Aptitude. Tata McGraw-Hill, 2003.
3. Thorpe, Edgar. Test Of Reasoning. Tata McGraw-Hill,2003.
4. Prasad,H.M. How to prepare for Group Discussion and Interview. Tata McGraw-Hill,2001.
5. Career Press Editors.101 Great Resumes. Jaico Publishing House,2003.
6. Aggarwal, R.S. A Modern Approach to Verbal & Non-Verbal Reasoning. S. Chand & Co.,2004.
7. Mishra Sunita and Muralikrishna, Communication Skills for Engineers, First Edition. Pearson Education, 2004.

IT T71 MULTIMEDIA SYSTEMS

UNIT-I

Definition–Multimedia Elements–Multimedia System Architecture –Multimedia I/O Technologies–Multimedia Applications.

UNIT-II

Multimedia Data File Formats – BMP, GIF, JPEG, PNG,TIFF, RIFF, WAV, AVI – Multimedia Data Representation–Review of Text, Image, Audio and Video Compression Techniques.

UNIT-III

Multimedia Presentation and Authoring–Multimedia Authoring Tools–Multimedia Editing Tools–VRML–Recent Tools.

UNIT-IV

Quality of Multimedia Data Transmission–Multimedia Over IP–Multimedia over ATM Networks–Multimedia on Demand– Multimedia over Wireless Networks.

UNIT-V

Multimedia Applications– Multimedia Conferencing–Content Based Image Retrieval for Digital Libraries–Knowledge-Based Multimedia Systems–Multimedia Interchange.

Text Books :

1. Prabhat K. Andleigh and Kiran Thakrar, Multimedia Systems Design, Pearson Education,2008.
2. Ze-Nian Li and Mark S.Drew, Fundamentals of Multimedia, Pearson Education, 2004.

Reference Books :

1. Ralf Steinmetz and Klara Nahrstedt, Multimedia Computing, Communications and Applications , Pearson Education, 2008.

2. Fred Halsall, Multimedia Communications: Applications, Networks, Protocols and Standards , Pearson Education,2008.

3. John F Koegel Buford, Multimedia Systems, Pearson Education,2008.

4. Judith Jeffcoate, Multimedia in Practice–Technology and Applications, Prentice Hall of India, 2001.

IT T72 EMBEDDED SYSTEMS

Unit I - Introduction To Embedded Systems
Definition and Classification – Overview of Processors and hardware units in an embedded system – Software embedded into the system – Exemplary Embedded Systems – Embedded Systems on a Chip (Soc) and the use of VLSI designed circuits

Unit II - Devices And Buses For Devices Network
I/O Devices - Device I/O Types and Examples – Synchronous - Iso-synchronous and Asynchronous Communications from Serial Devices - Examples of Internal Serial-Communication Devices - UART and HDLC - Parallel Port Devices - Sophisticated interfacing features in Devices/Ports- Timer and Counting Devices - ' I^2C', 'USB', 'CAN' and advanced I/O Serial high speed buses- ISA, PCI, PCI-X, cPCI and advanced buses.

Unit III - Programming And Interfacing 8051
8051 Micro controller-architecture-memory organization- special function registers- timing and control- port operation- interrupts.
Programming 8051- operand types- operand addressing-data transfer instructions- arithmetic and logical instructions- control transfer instructions-
Interfacing 8051- programming 8051 resources- timers/ counters- Serial interface – Multi processor communication – measurement of frequency, period and pulse width of a signal- memory interfacing – I/O interfacing

Unit IV - Real Time Operating Systems – Part - 1
Comparison of process, task and thread – characteristics of ISRs and Tasks – OS services – goals – structures – kernel – process management – memory management – device management – file system organization and implementation – I/O systems – Interrupt routines-handling in RTOS-RTOS task scheduling models.
INTER PROCESS COMMUNICATION AND SYNCHRONISATION – Shared data problem – Use of Semaphore(s) – Priority Inversion Problem and Deadlock Situations – Inter Process Communications using Signals – Semaphore Flag or mutex as Resource key – Message Queues – Mailboxes – Pipes – Virtual (Logical) Sockets – Remote Procedure Calls (RPCs).

Unit V - Real Time Operating Systems – Part - 2
Study of Micro C/OS-II or Vx Works or Any other popular RTOS – RTOS System Level Functions – Task Service Functions – Time Delay Functions – Memory Allocation Related Functions – Semaphore Related Functions – Mailbox Related Functions – Queue Related Functions – Case Studies of Programming with RTOS – Understanding Case Definition – Multiple Tasks and their functions – Creating a list of tasks – Functions and IPCs – Exemplary Coding Steps.

Textbooks

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003
2. Krishna Kant, Microprocessors and Microcontrollers- Architecture, programming and System design 8085,8086,8051,8096, PHI,2007.

Reference Books

1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes,
2. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.
3. Wayne Wolf, Computers as Components; Principles of Embedded Computing System Design – Harcourt India, Morgan Kaufman Publishers, First Indian Reprint 2001
4. Frank Vahid and Tony Givargis, Embedded Systems Design – A unified Hardware /Software Introduction, John Wiley, 2002.

IT T73 COMPONENT TECHNOLOGY

Unit I

Client/server computing- building blocks-types of servers-types of clients- types of middleware-aspects of client/server systems- sizing-scalability- tiered architecture-client/server models-Requirements of client/server systems-Distributed objects-benefits-drawbacks-from distributed objects to components

Unit II

Component technology- components- definitions- properties-benefits-components and interfaces-direct and indirect interfaces- versions- interfaces as contracts-callbacks-forms of design level reuse- connection oriented programming-connectable objects- component architecture- component frameworks- composition- data driven, contextual, aspect oriented programming, subject oriented programming, XML components-component development- assembly.

Unit III

The Microsoft way-component object model- From COM, COM+, DCOM to .NET framework-evolution- web services technologies-XML,WSDL,UDDI,SOAP-Common Language Runtime-.NET framework class library-ADO.NET,ASP.NET

Unit IV

The Sun Way-component variety – applets, servelets, java beans, enterprise beans-EJB architecture- types of beans- characteristics-Building and deploying distributed applications using EJB

Unit V

The OMG way-system object model- CORBA timeline-CORBA architecture-ORB-services-facilities-business objects-IIOP-transport mechanisms- IDL- - CCM- CCM container

Text books

1. Clemens szyperski,Dominik Gruntz and Stephan Murer ,Component Software beyond object oriented programming, third edition, Pearson education,2004.
2. Robert Orfali,Dan Harkey,Jeri Edwards,Client/ Server Survival Guide, Third edition,John wiley Inc,2003.

References

1. David Chappell, Understanding .NET, Pearson Education Inc, 2002.
2. Bill Burke, Richard Monson-Haefel, Enterprise JavaBeans, Fifth Edition, O'Reilly, 2001.
3. Dan Harkey, Robert Orfali,Client/Server programming with JAVA and CORBA, second edition, Wiley & sons Inc, 1999.

IT P71 ADVANCED SOFTWARE LAB

CYCLE I - MULTIMEDIA LAB EXERCISES

1. To implement various Text Compression Algorithms.
2. To implement various Image Compression Algorithms.
3. To perform animation using any Animation Software.
4. To perform basic operations on image using any Image Editing Software.

CYCLE II - EMBEDDED SYSTEMS LAB

1. Study of 8051 micro controller
2. Simple computational problems
3. Reading and Writing on a parallel port.
4. Timer in different modes.
5. Serial communication implementation
6. Measurement of frequency, amplitude, and pulse width of a signal
7. Keypad and seven segment display Interfacing
8. Interfacing DC motor
9. Interfacing Stepper motor
10. Interfacing ADC
11. I^2C programming

IT P72 COMPONENT TECHNOLOGY LAB

The students have to develop distributed applications for a given domain using the following technologies:

1. RMI using JDBC
2. CORBA
3. COM
4. DCOM
5. ASP.NET/C#. NET
6. SERVLETS
7. EJB
8. MESSAGE BEANS
9. An interoperable application involving either language/ network protocol heterogeneity or involving any two of the above technologies.
10. Application development using ASP, PHP, JSP

IT P73 PROJECT WORK (PHASE-I)

The objective of the project is to enable the students to work in convenient groups of not more than three members in a group on a project of latest topic / research area / industrial applications. Each project group shall have a guide who is a faculty member.

During the seventh semester, the students are expected to undergo Phase-I of the project. The project group is required to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. The departmental committee shall examine the students for 100 marks and the evaluation is based on continuous internal assessment comprising one seminar (30 marks), demo (30 marks) and one internal viva-voce (40 marks).

IT P74 SEMINAR

The objective of the seminar is to encourage the students to work independently and to get exposure in latest technologies. The topic shall be chosen in consultation with a faculty member who would be the guide. Each student is expected to make a critical review of literature and prepare a report. The student is expected to present a seminar. The departmental committee will evaluate the performance of the students in the seminar and the report for 100 marks.

IT P75 INDUSTRIAL TRAINING / VISIT

In the course of study, during 5th and 6th semesters, each student is expected to undertake a minimum of four industrial visits (leading hardware manufacturing / software development concerns) or undertake a minimum of two weeks / 15 days of industry training(in a reputed concern). Based on the industrial visits / training, the student has to submit a report at the end of sixth semester highlighting the exposure he/she gained. The report will be evaluated by the departmental committee for 100 marks. The proofs for having undergone visits / training are to be enclosed along with report as enclosures.

IT T81 SERVICE ORIENTED ARCHITECTURE

Unit – I

SOA and Web Services Fundamentals: Fundamental SOA- Common characteristics of Contemporary SOA – Common misperceptions about SOA- Common tangible benefits of SOA- Common pitfalls of adopting SOA.

Evolution of SOA: An SOA Timeline- Continuing evolution of SOA - The roots of SOA.

Unit – II

Web Services and Primitive SOA: The Web Services framework – Services – Service Descriptions – Messaging.

Web Services and Contemporary SOA (Part I – Activity Management and Composition) Message Exchange Patterns – Service Activity – Coordination – Atomic Transactions – Business Activities – Orchestration – Choreography.

Unit – III

Web Services and Contemporary SOA (Part II –Advanced Messaging, Metadata, and Security) Addressing – Reliable Messaging – Correlation – Policies – Metadata Exchange – Security – Notification and eventing.

SOA and Service Orientation: Principles of Service Orientation – Service Layers.

Unit IV

Building SOA (Planning and Analysis): SOA delivery Strategies – Service Oriented Analysis: Introduction – Service Modeling.

Unit V

SOA Platforms: SOA platform basics – SOA support in J2EE – SOA support in .NET – Integration Considerations - Case Studies.

Text Book

1. Service- Oriented Architecture Concepts, Technology, and Design, Thomas Erl Pearson Education, 2007.

Reference Books:

1. SOA Principles of Service Design Thomas Erl, Pearson Education ISBN 978 – 81 – 317 - 2309 – 8, 2008.
2. Applied SOA Service Oriented Architecture and Design Strategy, Michael Rosen, Boris Lublinsky, Kevin T.Smith, Marc J.Balcer Wiley India ISBN 978-81-265-1766-4, 2008.

IT T82 DISTRIBUTED COMPUTING

UNIT-I

Introduction:- Characteristics, Examples, Applications, Challenges – System models:- Architectural models and Fundamental models – Network principles and Internet protocols – Interprocess communication: API, Marshalling, Client-server communication, Group communication,

UNIT-II

Distributed objects and Remote Invocation:- Introduction, Communication between distributed objects, Remote Procedure Call, Events and Notification – Operating System Support:- Introduction, OS Layer, Protection, Processes and Threads, Communication and invocation, Operating system architecture

UNIT-III

Distributed File System:- File service architecture, Sun network and Andrew File system, Recent advances – Name Services:- Domain Name System, Directory and discovery services, Case study for Global name service and Directory service – Time and Global States:- Clocks, events and processes, Clock synchronization, Logical clocks, Global states, Distributed debugging – Coordination and Agreement

UNIT- IV

Transaction and Concurrency Control:- Transactions and nested transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of concurrency control – Distributed Transactions – Replication - Distributed Shared Memory: Design and implementation issues, Consistency models

UNIT-V

Distributed Multimedia Systems:- Characteristics, Quality of service management, Resource management, Stream adaptation – Web Services:- Introduction, Service descriptions and IDL, Directory service, XML Security, Coordination of web services -Case Study:- CORBA

TEXT BOOK

George Coulouris, Jean Dollimore, Tim Kindberg, *Distributed Systems Concepts and Design*, Fourth Edition, Pearson Education India, 2005

REFERENCE

Andrew S. Tanenbaum, Maarten Van Steen, *Distributed System: Principles and Paradigms*, Second Edition, Prentice-Hall, 2003

IT T83 MANAGEMENT CONCEPTS AND STRATEGIES

Unit-I

Management: Science Theory and Practice - Management and Society: Social responsibility and Ethics. The nature and purpose of planning - objectives – Strategies-Policies and planning premises.

Unit-II

Decision making. The Nature and purpose of organizing - Basic departmentation - Line /staff Authority and decentralization - Effective Organizing and organizational culture.

Unit-III

Human Resource Management and selection - Performance appraisal and career strategy - Manager and organizational development.

Unit-IV

Managing and the Human factor - Motivation - Leadership - communication.

Unit-V

The system and Process of controlling control techniques and information Technology - Productivity and Operations Management - Overall and Preventive Control - Towards a unified, Global management theory.

Text Books

1. Herald Knootz and Heinz Weihrich, Essentials of Management, McGraw-Hill Publishing Company, Singapore International Edition, 2000.
2. Ties AF, Stoner and R.Edward Freeman, Management, Prentice Hall of India Pvt., Ltd., New Delhi 110 011, 2003.
3. Joseph l, Massie, Essentials of Management, Prentice Hall of India Pvt., Ltd., New Delhi 110 011, 2002.

HS P81 PROFESSIONAL ETHICS

The course should cover the following topics by way of Seminars, Expert Lectures and Assignments:

1. Engineering Ethics – Moral issues, Ethical theories and their uses
2. Engineering as Experimentation – Code of Ethics
3. Engineer's responsibility for safety
4. Responsibilities and rights
5. Global issues of engineering ethics

Reference Book

1. Charles D.Fleddermann, Engineering Ethics, Prentice Hall, New Mexico, 1999

IT P82 PROJECT WORK (PHASE-II)

The objective of the project is to enable the students to work in convenient groups of not more than three members in a group on a project of latest topic / research area / industrial applications. Each project group shall have a guide who is a faculty member.

During the eighth semester, the students are expected to complete the project (Phase - II) and submit a full-fledged report comprising of the complete system developed along with implementation and test results. The departmental committee shall examine the students for 50 marks and the evaluation is based on continuous internal assessment comprising one seminar (25 marks) and demo for complete system developed (25 marks). At end of the semester, a viva-voce examination will be conducted for 50 marks (25 marks for internal examiner and 25 marks for external examiner).

IT P83 COMPREHENSIVE VIVA VOCE

The students will be tested for their understanding of subjects of study in the curriculum from 3rd semester to 8th semester. A comprehensive examination, preferably with objective type questions, will be conducted and evaluated the performance of the students for 50 marks. A comprehensive viva voce examination will be conducted for 50 marks with one internal examiner and one external examiner appointed by the University.

IT E61 BIO INFORMATICS

Unit I

Introduction of Bioinformatics: Definition – Challenges in Bioinformatics- Internet and bioinformatics – Molecular biology's central dogma – DNA , RNA and proteins – Genes and Genomes – Representation of DNA , RNA and protein structures – codons and anticodons – open reading frames (ORF) – exons and introns – software tools for bioinformatics.

Unit II

Literature Databases : Public databases and data formats, popular gene and protein databases – Sequence alignment and sequence searching – Database search strategies – querying strategy , similarity searching vs homology – popular tools for database searching and querying – FETCH, LOOKUP, ENTREZ , NetFETCH , BLAST, FASTA – interpretation of results.

Unit III

Pairwise alignment: Problem definition & biological motivation – similarity and differences – global alignment, local alignment – gap penality models- substitution matrices – PAM, BLOSUM – Applying dynamic programming to pairwise alignment – Needleman – WUNSCH algorithm, Smith – waterman algorithm.

Unit IV

Multiple sequence alignment: computational challenges – Dynamic programming solution – approximation algorithms – center star, distance from concensus , sum of pairs progressive alignment , multiple alignment to a phylogenic tree – Tools for Multiple sequence alignment – CLUSTALW.

Unit V

Phylogenetic analysis : Bais Definitions – From MSA to phylogenetics – Phylogentic tree construction methodologies – distance based methods – UPGMA, Neighbour joining – Character based methods – maximum parsimony – fitch algorithm, weighted parsimony – sankoff's algorithm , maximum likelihood, tools for phylogenetic tree construction PAUP, PHYLIP

Textbooks

1.S.Sundararajan, R. Balaji , Introduction to Bioinformatics, Himalaya Publishing House, 2002.
2. Rastogi S C, Namita Mendiratta and Parag Rastogi, Bioinforamtics - Concepts, Skills, Applications, CBS Publications & Distributors, New Delhi, 2003.
3. Teresa Attwood, David Parry-Smith, Introduction to Bioinformatics, Pearson Education, New Delhi, 2001.

IT E62 PARALLEL COMPUTING

UNIT I – Introduction

Need of high speed computing – increase the speed of computers – history of parallel computers and recent parallel computers; solving problems in parallel –temporal parallelism – data parallelism – comparison of temporal and data parallel processing – data parallel processing with specialized processors – inter-task dependency.

UNIT II - Instruction level parallel processing

Pipelining of processing elements – delays in pipeline execution – difficulties in pipelining – superscalar processors – very long instruction word (VLIW) processor – commercial processors – multithreaded processors – future processor architectures.

UNIT III - Structure of Parallel Computers

A generalized structure of a parallel computer –classification of parallel computers – vector computers – a typical vector super computer– array processors – systolic array processors – shared memory parallel computers – interconnection networks – distributed shared memory parallel computers – message passing parallel computers – cluster of workstations.

UNIT IV

Classification of parallel algorithms: Synchronized and Asynchronized parallel algorithms – Performance of parallel algorithms – Elementary parallel algorithms: Sorting and Searching.

UNIT V

Matrix operations: Transposition - Matrix-by-matrix multiplication - Matrix-by-vector multiplication - Solving systems of linear equations – Graph algorithms: Connectivity matrix - Connected components - All-pairs shortest path - Minimum spanning tree.

Text Books

1. V. Rajaraman and C. Siva Ram Murthy, Parallel Computers – Architecture and Programming, Prentice-Hall of India, 2004.
2. Michael J. Quinn, Parallel Computing – The Theory and Practice, McGraw-Hill, 1994.

Reference Books

1. Kai Hwang, Faye A. Briggs, Computer Architecture and parallel processing, McGraw-Hill International editions, 1985.
2. David E. Culler and Jaswinder Pal Singh, Parallel Computing Architecture: A Hardware/Software Approach, Morgan Kaufman Publishers, 1999.
3. Michael J. Quinn, Parallel Programming in C with MPI and OpenMP, McGraw-Hill, 2004.
4. Selim G. Akl, The Design and Analysis of Parallel algorithms, PHI, 1999.

IT E63 COMPUTER GRAPHICS

Unit I - Graphics Systems & Graphical User Interface
Pixel, Resolution, Interactive Vs Non-interactive - video display devices - types – Input devices – Hard copy devices – GKS. User dialogue – graphics data Input – Input function – Interactive picture construction techniques.

Unit II - Display Primitives & Attributes
Points display – Line drawing: DDA, Bresenham's algorithms – Circle, Ellipse and Curve generating algorithms – Fill area primitives – Character generation – Pixel addressing - Line attributes – Area fill attributes bundled attributes.

Unit III - Two Dimensional Transformations & Viewing
Transformations - types – matrix representation – Concatenation - Scaling, Rotation, Translation, Shearing, mirroring. Homogeneous coordinates – Window to view port transformations - Windowing and Clipping: Lines, Polygons - boundary intersection and midpoint - subdivision methods - Character and Text clipping.

Unit IV - Three Dimensional Concepts & Transformations
Three-dimensional display methods – Three-dimensional curves & surfaces – Sweep representations – Solid geometry methods – Octrees – fractal geometry- Three dimensional transformations – Modeling & Coordinate transformations.

Unit V - Three Dimensional Viewing
Visible Surfaces, Rendering &Animation -World to viewing transformations – Projections – view volumes – Clipping. Visible surface detection methods, Light sources – Illuminations models – Light intensities.

Text Book
1. Donald Hearn & M. Pauline Baker, Computer Graphics, Prentice Hall of India – 4th edition, 2004.

Reference Book
1.Newmann W.M. and Sproull R.F., Principles of Interactive Computer Graphics,
Tata McGrawHill, Second edition, 2000.

IT E64 SOFT COMPUTING

Unit I

Introduction - Soft Computing Concept Explanation - Importance of Tolerance -of Imprecision and Uncertainty - Biological and Artificial Neuron - Neural Networks - Adaline - Perceptron - Back Propagation Neural Networks - Feedforward Multilayer Networks.

Unit II

Types of Neural Networks - Competitive Learning- Kohonen Maps - CPN - ART - Neocognitron Neural Networks - Neural Networks As Associative Memories: Hopfield and Bidirectional Associative Memory.

Unit III

Fuzzy Systems – Fuzzy Sets – Operations and Properties- Fuzzy Rules and Reasoning - Fuzzy Inference Systems – Fuzzy Models- Adaptive Neuro-Fuzzy Inference Systems

Unit IV

Derivative-based Optimization – Derivative-free Optimization –Genetic Operations – Crossover – Mutation – Fitness Scaling – Inversion - Genetic Algorithms.

Unit V

Applications: Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

Text Books

1. J.S.R.Jang, C.T.Sun and E.Mizutani, Neuro-Fuzzy and Soft Computing, PHI, 2007.
2. Aliev,R.A, Aliev,R.R.: Soft Computing and its Application, World Scientific Publishing Co. Pte. Ltd., 2001.
3. S. Rajasekaran and G.A.V.Pai, Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI, 2003.

IT E65 DIGITAL SIGNAL PROCESSING

UNIT I – Introduction

Advantage of digital over analog signal processing – Discrete time signals and systems - Analysis of discrete time LTI systems - Difference equations. Applications of DSP in speech and image processing - Introduction to biomedical signal processing and communication.

UNIT II - DFT and FFT

Discrete Fourier transform and its properties - Relation between z transform, Discrete Time Fourier transform (DTFT) and DFT- Frequency analysis of signal using DFT- FFT algorithms - Advantages over discrete computation of DFT - radix2 algorithms - Decimation in time Decimation in frequency-Computation of IDFT using FFT.

UNIT III - Implementation of Discrete Time Systems

Structures for FIR systems-discrete form, cascade and linear phase structures - structures for IIR systems-discrete form, parallel, cascade and ladder structures - Representation of numbers-errors resulting in rounding and truncation-quantization of filter coefficients - round off effects in digital filter – product quantization error, overflow limit cycle oscillations.

UNIT IV - Design of Digital Filters

Design of FIR filters- design of linear phase FIR filters using window & frequency sampling method-Design of IIR filters from analog filters-impulse invariant and bilinear transformation methods**.**

UNIT V - Power Spectrum Estimation

Computation of energy density spectrum-the period gramuse of DFT in power spectrum estimation-non parametric methods-Bartlett & Welch method-parametric methods-AR, MA and ARMA models.

Text Books

1. Proakis and Manolakis, Digital Signal Processing, Principles, Algorithms and Applications, Pearson education, 3rd edition, 2003.

Reference Books

1. Rabiner and Gold, Theory and applications of Digital Signal Processing, Prentice Hall of India, 1998.
2. Mcclellan, Schafer and Yoder, Signal processing first, Pearson education, 2003.
3. Ramesh Babu, Digital Signal Processing , Sci tech publications, 2001.
4. V. K. Khanna, DSP Telecommunication & Multimedia Technology, S. Chand & Company, 2003.

IT E66 COMPUTER HARDWARE AND TROUBLESHOOTING

Unit I - Pc Hardware Overview
Introduction – Basic Parts of PC – Functional block diagram – system board – Microprocessor – Interrupts – DMA – SMPS – BIOS – POST sequence - System configuration – Memory – Mass storage – I/O interface standards.

Unit II - Bus Standards and Networking
ISA – PCI – SCSI – IDE – USB – comparative study and characteristics – Network Interface Cards – Cables and connectors - MODEM – AT command set.

Unit III - Peripheral Devices & Display Adapters
Functional descriptions of keyboard – mouse – printers – joystick – scanners – CGA – SVGA.

Unit IV - Mass Storage Devices
Floppy disk and drive – Hard disk and drive – MFM and RLL recording standards – CD technology – DVD technology – pen drives – tape drives

Unit V - Troubleshooting & Tools
In-Circuit Emulators – Logic State/Timing Analysers – Digital Multimeters – CROs – Signature Analysers – Troubleshooting problems of system boards, add on cards and peripherals.

Text Books
1. Hans Peter Messmer, Indispensable PC Hardware Book , Pearson Education, 4th edition, 2003.

2. Govindarajulu, IBM PC and Clones , Tata McGraw Hill, 4th edition, 2002.

Reference Books
1. Barry Brey, The Intel Microprocessors 8086/88, 80186/188,80286, 80386,80486, PENTIUM and PENTIUM PRO architecture, Programming and Interfacing, 6th edition, PHI, 2002.

2. Ed Tittel, David Johnson, Networking Essentials: Study Guide, Comdex Computer Publishing, 1998.

3. Scott Muller, Upgrading and Repairing PCs, 15th edition, Que, 2002.

IT E67 e-BUSINESS

Unit I

Definition of e-Business – Comparison of e-Business with E-Commerce – Advantages of e-Business – Limitations of e-Business – Rules of e-Business.

Unit II

Spotting e-Business Trends – e-Business Revolution – e-Business Model Schematics – Atomic e-business Models and Initiatives.

Unit III

e-Business Categories – E-Auctioning – E-Banking – E-Directories – E-Engineering – E-Franchising – E-Gambling – E-learning – E-Marketing – E-Operational Resources Management – E-Supply – E-Travel.

Unit IV

Internet Networking – Deciding Enterprise Middleware – Choosing the Right Enterprise Applications – Building e-Business Applications – Payment in e-Business – Return on Investment.

Unit V

Legal Issues – Global Contracts- Website Issues - Crisis Management - Digital Complaint Services - Cyber Law – Some e-Business Applications.

Text Books

1. Peter Weill and Michael R. Vitale, Place to Space : Migrating to e-Business Models, Harvard Business School Press, 2001
2. Daniel Amor, e-Business (R)evolution, Pearson Education, 2001.
3. Ravi Kalakota and Marcia Robinson, e-Business 2.0 Roadmap for Success, Pearson Education, 2nd Edition, 2000.

IT E68 SOFTWARE TESTING

Unit I

Software testing -The Role process in Software Quality- Testing as a process- Overview of testing maturity model, software testing definition- Software Testing Principles – Origin of defects, Defect classes, the defect Repository and Test Design

Unit II

Testing Strategies: Testing design strategies, Test case design strategies, Black box testing , Random Testing, Equivalence partitioning, Boundary value analysis , Cause-and-Effect, State transition, Error Guessing, COTS, White box testing techniques - Statement coverage - Branch Coverage - Condition coverage - Decision/Condition coverage - Multiple condition coverage - Dataflow coverage - Mutation testing

Unit III

The Need for Levels of Testing, unit test, Planning, Designing the unit tests, Integration test, Integration Strategies for Procedure and Functions, Integration strategies for Classes, Integration test planning, System Test: Functional Testing, Performance Testing, Stress Testing, Configuration Testing, Security Testing, Recovery Testing, Regression testing, Alpha, Beta and Acceptance Tests.

Unit IV

Testing Object Oriented Software: Unit Testing in OO Context, Integration Testing in OO Context, OO testing methods, Class level testing, Interclass test case design, testing for real time system

Unit V

Controlling and Monitoring: Measurements and Milestone for Controlling and Monitoring: Status, Productivity, Cost, Error, fault and Failures, Effectiveness, Criteria for Test Completion, Reviews as testing Activity: Inspection Walkthrough, Components of review plan, testing for web application, Component level testing, Clean room tests.

Text Book

1. Ilene Burnstein, Practical Software Testing, Springer-Verlag First Indian Reprint 2004.

Reference Books

1. Ali Behforooz, Frederick J Hudson, “Software Engineering Fundamentals”, Oxford University Press, New York, 2003.
2. William Perry, Effective Methods for Software Testing , John Wiley & Sons, Second edition, USA, 2000.
3. Roger S Pressman, Software Engineering – A Practitioner’s Approach, McGraw Hill, Sixth Edition, 2006.

IT E71 MATHEMATICAL STATISTICS AND NUMERICAL METHODS

Unit I - Solution of Algebraic Equations and Solution of Linear Simultaneous Equations
The method of Bisection, the method of false position, Newton-Raphson method, Gauss elimination method, Crout's reduction, Gauss- Seidel Iterative method - Power method for finding the numerically largest Eigen value.

Unit II - Interpolation, Differentiation and Integration
Interpolation by Newton's forward and backward difference formulae for equal intervals, Lagrange's interpolation formula for unequal intervals, Differentiation based on finite differences to find first and second order derivatives, Integration by Trapezoidal and Simpson's 1/3 rule.

Unit III - Reliability
Concept of Reliability, Reliability and Availability of systems, Maintainability, Preventive maintenance

Unit IV - Quality Control
Introduction, Process control, Control charts for variables and attributes (X , R, p, np, c charts only).

Unit V - Queuing Theory
The Birth-Death process (M/M/1/∞, M/M/c/∞, M/M/1/N, M/M/c/N (N>c), M/M/c/c, M/M/∞ models only), M/G/1 model - Pollaczek-Khinchin formula.

Text Books
1. M.K.Venkataraman, Numerical methods in Science and Engineering, Fifth edition (1999), The National Publishing Company, Chennai.

2. E. Balagurusamy, Reliability Engineering, Tata McGraw-Hill Publishing Company Limited, 1984. (For Unit III).

3. S.P.Gupta, Statistical Methods, Sultan Chand & Sons, New Delhi, 2006 (for Unit IV).

4. D.Gross, and C.M.Harris, Fundamentals of Queuing Theory, 2nd edition, Wiley, New York, (1985). (For Unit V).

IT E72 BUSINESS PROCESS MANAGEMENT

Unit I

Nature, significance and rationale of business process reengineering (BPR) – Fundamentals of BPR – Classification of Reengineering Projects – Role of information technology (IT) and identifying IT levers – BPR phases, Relationship between BPR Process – Typical BPR activities within phases.

Unit II

Methodology for Reengineering Businesses – Reengineering Tools – Integration of Process Reengineering and TQM – BPR and Information Systems.

Unit III

Types of Business Organizations – Organizational Structures – Definition – Complexity – Formulization – Size – Technology – Culture – Forms and Outcomes – Explanations of Structures – IT Industry and Organizational Structures – Case Studies.

Unit IV

Organizational Power and Power Outcomes – Leadership and Decision Making– Communication and Organizational Change– Organizational Environments and Effects– Inter and Intra organizational Relationships– Organizational Effectiveness – Case Studies.

Unit V

Business Process Definition – Business Process Example – Workflow Management – Business Process Management – Paperless Office – Generations of Workflow Management – Life Cycle of Business Process Management – BPM Standards – Tools 0f BPM – e-Government Applications.

Text Books

1. Richard H.Hall, Organizations– Structures, Processes and Outcomes , Pearson Education, 2004.
2. Vikram Sethi and William R. King, Organizational Transformation through Business Process Reengineering , Pearson Education, 2008.
3. Howard Smith and Peter Fingar, Business Process Management. The Third Wave, Meghan-Kiffer Press, 2006.

Reference Books

1. Gareth Jones, Organizational Theory, Design and Change, Pearson Education, 4th Edition, 2004.
2. Dave Chaffey, E-business and E-Commerce, Pearson Education, 2nd Edition, 2003.

IT E73 IMAGE PROCESSING

Unit I

Digital Image Fundamentals: digital image representation –fundamental steps involved in digital image processing – components of image processing system – image sensing and acquisition – image sampling and quantization – basic relationships between pixels –examples of fields that use digital image processing. Image Transforms: introduction to Fourier transform – Discrete Fourier Transform – Fast Fourier Transform – Cosine, Sine, Hadamard, Haar, Slant and KLT transforms.

Unit II

Image Enhancement: basic gray level transformations – histogram processing – enhancement using arithmetic/logic operations – basics of spatial and frequency domain filtering – smoothing spatial and frequency domain filters - sharpening spatial and frequency domain filters. Color Image Processing: fundamentals – color models – pseudo color image processing – color transformations – color image smoothing and sharpening – color segmentation – noise in color images.

Unit III

Image Restoration: model of the image degradation/restoration process – noise models – restoration in the presence of noise only-spatial filtering – periodic noise reduction by frequency domain filtering – linear, position-invariant degradations – estimating the degradation function – inverse, wiener, constrained least square and geometric mean filtering – geometric transformations. Wavelets and Multi-resolution processing: background – Multi-resolution expansions – wavelet transforms in one dimension and two dimensions – fast wavelet transform – wavelet packets.

Unit IV

Image Compression: fundamentals – image compression models – elements of information theory – error-free compression – lossy compression – image compression standards. Morphological Image Processing: preliminaries – dilation and erosion – opening and closing – hit-or-miss transform – some basic morphological algorithms.

Unit V

Image Segmentation: detection of discontinuities – edge linking and boundary detection – thresholding – region based segmentation. Representation and Description: representation – boundary descriptors – regional descriptors – relational descriptors.

Text Books

1. Rafael C. Gonzalez and Richard E. Woods, Digital Image Processing, 2nd edition, Pearson Education Pvt. Ltd, 2002.
2. Anil K. Jain, Fundamentals of Digital Image Processing, Prentice Hall of India, 2001.

Reference Book:

1. Gonzalez, Woods, and Eddins, Digital Image Processing Using MATLAB, 2nd Edition, Prentice Hall, 2009.

IT E74 WEB TECHNOLOGY

UNIT I

Internet principles – Basic Web concepts – Client –Server model – Retrieving data from Internet - Protocols and applications. Web Design process: Web process Model-Goals and problems-design phase-Testing. Site Types and Architecture-Web site types-Dynamic Sites-site structures

UNIT II

Search and Design: Worldwide search-web searching overview-working of search engines-search engine promotion-optimization-Search interface.

Web protocols-HTTPDNS,- Web Servers-components-software, web hosting. Browsers-HTML and scripting languages-cookies- Multimedia in web design.

UNIT III

Web Technologies: Anatomy of xml document - XML markup-working with elements and attributes - creating valid documents-xml objects.

ActiveX controls: Introduction- Building a basic control - OLE and ActiveX- HTML and ActiveX-ActiveX Documents.

UNIT IV

Streaming – Networking Principles – Sockets for Clients - Sockets for Servers – Protocols handlers – Content handlers – Multicast sockets – Remote method invocation.

UNIT V

Internet Security: The Internet-Understanding Firewalls-Hackers-TCP/IP from a security view point –sockets and services-Encryption. Firewall Technology-packet filtering- Network Address Translation-application level proxies-VPN- ideal firewall.

TEXT BOOKS

1.Thomas A.Powell , The Complete Reference Web design, TataMcGraw-Hill ,2000.
2.Mathew strebe, charles perkins, Firewalls, BPB , 2000.

REFERENCE BOOKS

1.Eillotte Rusty Harold, Java Network Programming, O'Reilly Publications, 1997.
2. John paul Mueller,Active X from the Ground up, TataMcGraw-Hill,1997.
3.Michael Girdley, Kathryn A. Jones, et al., Web programming with JavaTM, Sams.net publishing, 1996.

IT E75 MOBILE COMMUNICATION NETWORKS

Unit I

Introduction: History of wireless communications- Simplified reference model-Applications. Telecommunication Systems: GSM, Mobile Services, System Architecture, Radio Interface, Protocols, Localization and calling, Handover, Security. DECT, TETRA, UMTS and IMT 2000

Unit II

Wireless LAN technology: Over view, Infrared LANs, Spread spectrum LANs, Narrow band microwave LANs – 802.11 protocol: Architecture, Services, Medium access control, Physical layer – Bluetooth technology: Overview, Radio Specification, Base band Specification, Link Manager Specification, Logical Link Control and Adaptation Protocol.

Unit III

Mobile IP: Goals, Assumptions, requirements, IP packet delivery, Agent advertisement and discovery, registration, Tunnelling and encapsulation, Optimization, Reverse tunnelling, IPv6, Dynamic host configuration protocol – Ad hoc networking: Routing, destination sequence distance vector, dynamic source routing, hierarchical routing, and Alternative metrics.

Unit IV

Mobile TCP: Traditional TCP, Indirect TCP, Snooping TCP, Fast retransmit, selective retransmission, Transaction oriented TCP – WAP: Architecture, Protocol description.

Unit V

Sensor Networks: Unique constraints and challenges – Advantages of Sensor networks –Sensor network Applications – Collaborative processing – Key Definitions of sensor networks – A tracking Scenario – problem formulation –Inference of states – Tracking Multiple Objects – Sensor models –Performance comparison and metrics.

Text Books

1. W. Stallings, Wireless Communications and Networks, Prentice Hall, 2007.
2. J. Schiller, Mobile Communications, 2nd edition, Pearson education, 2004.
3. Feng Zhao, Leonidas Guibas, Wireless Sensor Networks – An Information processing Approach, Elsevier 2004.

IT E76 USER INTERFACE DESIGN

Unit I

Introduction – A Taxonomy Of Software Design – Goal-Directed Design – The Three Models– Visual Interface Design – Forms – Idioms And Affordances – History of Rectangles on the Screen – Windows-with-a-Small-w – Lord of the Files – Storage and Retrieval Systems – Choosing Platforms

Unit II

Behavior of Presentation – Orchestration and Flow – Techniques for Inducing and Maintaining Flow – Characteristics of Good User Interface – Postures and State – Idiocy –The Secret Weapon of Interface Design.

Unit III

The Interaction – Mouse Operations – Selection – Direct Manipulation – Manipulating gizmos – Repositioning – Resizing and reshaping – Arrowing – Direct-Manipulation visual feedback – Drag-and-Drop.

Unit IV

The Cast – The Meaning of Menus – Menu – Dialog Boxes – Dialog Box Etiquette –Toolbars – The Gizmos – Imperative and Selection Gizmos – Entry and Display Gizmos – New Gizmos.

Unit V

Eliminating the Error Messages – Managing Exceptions – Undo – Troubles – Redo –Special Undo Functions – Installation – Configuration – Personalization.

Text Books

1. Alan Cooper, The Essentials of User Interface Design, Wiley Dreamtech India (P)Ltd., 2002.
2. Ben Schneiderman, Designing the User Interface, Addison Wesley, 2000.

Reference Books

1. Alan Dix, Janet E Finlay, Gregory D. Abowd and Russell Beale, Human- Computer Interaction, Prentice Hall, 3rd Edition, 2003.
2. Jacob Nielson, Usability Engineering, Academic Press, 1993.

IT E77 SOFTWARE ARCHITECTURE

UNIT I

Understanding Software Architecture: Introduction - Software Architecture - Architecture Defines Structure - Architecture Specifies Component Communication -Architecture Addresses Non-functional Requirements - Architecture is an Abstraction - Architecture Views - Architectures and Technologies - General Architecture - Architecture Requirements - Architecture Patterns - Technology Comparisons - Introducing the Case Study - Requirements Overview - Project Context - Business Goals - Constraints -Software Quality Attributes - Design Trade-Offs.

UNIT II

Architectural Styles – Pipes and Filter – Data Abstraction and Object oriented organization – Event Based , Implicit invocation – Layered systems – Repositories – Interpreters – Process control – other Architectures – Heterogeneous Architecture - Case studies – Key word in context – Instrumentation software - Mobile robotics – cruise control – Three Vignettes in mixed style.

UNIT III

Architectural modeling – Subsystem – Closed layered – Open layered Architecture – Partitioning – Broker Architecture for distributed systems - Model view controller architecture – Design Patterns – Frameworks – Pattern Catalogues – Pattern Languages – Creational - Singleton – Factory – Structural – Adapter – Bridge – Behavioural – Observer – Visitor – Advantages and disadvantages of Patterns – Evaluation of Architectures - Need – Stakeholders – Results of Evaluation – Benefits of Evaluation – ATAM – Case study – Understanding Quality attributes – SAAM- Case study.

UNIT IV

Case Study Design: Overview - ICDE Technical Issues - ICDE Architecture Requirements - ICDE Solution - Architecture Analysis - The Challenges of Complexity Software Product Lines - Product Lines for ICDE - Software Product Lines - Benefiting from SPL Development - Product Line - Adopting Software Product Line Development - Product Line Adoption Practice Areas - Ongoing Software Product Line Development.

UNIT V

The Semantic Web: ICDE and the Semantic Web - Adaptive, Automated, and Distributed - The Semantic Web - Ontologies in ICDE - Semantic Web Services - Cautious Optimism - Software Agents: An Architectural Perspective - Agents in the ICDE Environment - An Example Agent Technology - Architectural Implications - Agent Technologies.

TEXT BOOKS

1. Ian Gorton, Essential Software Architecture, Springer – Verlag Berlin Heidelberg, 2008. (Unit I,III,IV,V)
2. Paul Clements, Rick Kazman and Mark Klein, Evaluating Software Architectures – Methods and Case Studies, Pearson Low Price Edition, India, 2008. (Unit – II)
3. Mary Shaw and David Garlan, Software Architecture – Perspectives of an Emerging Discipline, PHI, India, 2008. (Unit – II)
4. Mahesh P. Matha, Object – Oriented Analysis and Design using UML, PHI, India, 2008. (Unit – II)

IT E78 GIS AND REMOTE SENSING

Unit I

Introduction : Maps – Definition – Types of Maps – Characteristics of Maps – Map Projections – GIS – Definition – Components of GIS – Hardware, Software and Organizational Context – GIS software; Data Input : Data Types – Spatial and Non- Spatial – Spatial Data – Points, Lines and Polygons – Non-spatial data – Nominal, Ordinal, Interval and Ratio – Digitizer – Scanner – Editing and Cleaning – Georeferencing.

Unit II

Remote Sensing : Data collection, Data types - EM spectrum, Radiation and Earth – Simulated and False-color Images - LUTs and Band Correlation these web sites Image enhancement. Remote sensing of the Earth's surface utilizing the electromagnetic spectrum. Techniques of photography, Multispectral Scanning, and Microwave Imagery from Airplane, Satellite, and manned-spacecraft platforms. Image interpretation, practical applications in earth science and use of remotely sensed data in geographic information systems.

Unit III

Data Structure and Analysis : Raster and Vector Data Structure – Raster data storage – Run length, Chain and Block Coding – Vector Data Storage – Topology – Topological Models – ArcNode Structure – Surface Data – DEM – Gridded DEM and TIN structure- Applications of DEM

Unit IV

Data Analysis and Data Quality : Reclassification – Measurement – Buffering – Overlaying – SQL for Queries – Neighbourhood and zonal operations – Data Quality – Components of data quality - Sources of errors in GIS – Meta data

Unit V

Data Output and GIS Applications : Output – Maps, Graphs, Charts, Plots, Reports – Printers – Plotters – Fields of application – Natural Resource Management, Parcel based, AM/FM applications examples – Case study: Urban growth studies using GIS

Text Books

1. Peter A. Burrough and Rachael A. McDonnell, Principles of Geographical Systems, Oxford, University Press, 1988.
2. Anji Reddy Star J. and Estes. J., GIS – An Introduction, Prentice Hall, USA, 2002.
3. Robert Laurini and Derek Thompson, Fundamentals of Spatial Information Systems, Academic Press, 2002

IT E79 UNIX INTERNALS

UNIT – I

Introduction to the Kernel: Architecture of the UNIX operating system – Introduction to the system concepts – Kernel Data Structures; The Buffer Cache: Buffer Headers – Structure – Retrieval of a buffer – Reading and writing disk blocks – Advantages and Disadvantages; Internal Representation of Files: Inode – Structure of a regular file – Directories – Conversion of a path name to an Inode – Super Block – Inode Assignment – Allocation of disk blocks.

UNIT – II

File System Frame Work: The Vnode / Vfs Architecture – Objectives – Lessons from device I/O – Vnode / Vfs Interface – Implementation – Objectives –Vnode and Open files – The Vnode – Vnode Reference Count – The Vfs Object; Linux ext2fs and Proc file systems; System Calls for the file system: Open – Read – Write – File and record locking – lseek – Close – file creation – creation of special files – change directory and change root – change owner and change mode – Stat and Fstat – Pipes – Dup – Mounting and unmounting file systems – Link – unlink – File system abstractions – file system maintenance.

UNIT – III

The Structure of Processes: Process states and transitions – Layout of system memory – The context – saving the context – manipulation of the process address space – sleep; Process Control: Process creation – Signals – Process Termination – Awaiting Process Termination – Invoking other programs – The user ID of a process – The shell – System Boot and the INIT Process.

UNIT – IV

Process Scheduling and Time: Process scheduling – System calls for Time – Clock – Scheduler goals – Process priorities – Scheduler Implementation – Run Queue Manipilation – The SVR4 Scheduler; Memory Management Policies: Swapping – Demand Paging – A Hybrid System with swapping and demand paging.

UNIT – V

Inter Process Communication: Process Tracing – System V IPC – Network Communications - Sockets – Messages – Message Data Structures – Message Passing Interface – Ports – Name Space – Data Structures – Port Translations –Message Passing – Transferring port rights – Out – of – Line Memory – Control Flow – Notifications – Port Operations – Destroying a Port – Backup Ports – Port Sets – Port Implementation; Device Drivers and I/O: Device Driver Frame work – The I/O Subsystem – The poll System Call- Block I/O – The DDI / DKI Specification.

TEXT BOOKS

1. Maurice J. Bach, “The Design of the UNIX Operating System”, Prentice-Hall of India, 2004.
2. Uresh Vahalia, “UNIX Internals: The New Frontiers”, Pearson Education Asia, 2002.

REFERENCES

1. Silberschatz, Galvin and Gagne, Operating System Concepts, Wiley, Sixth edition, 2003.
2. Graham Glass and King Ables, “The New Frontiers”, Pearson Education, 2001.
3. William Stallings, “Operating System Internals and Design principles”, Prentice-Hall of India, Fourth edition, 2003.

IT E81 REAL TIME SYSTEMS

Unit I

Introduction to Real-Time system – Characteristics – Types of Real-Time tasks – Timing constraints –Real-Time Scheduling:- Basic concepts and classification of Algorithms – Clock-Driven Scheduling – Event-Driven Scheduling – Hybrid schedulers – EDF Scheduling – RM Scheduling and its Issues.

Unit II

Resource Sharing and Dependencies among Real-Time tasks: Resource sharing in Real Time tasks, Priority Inversion, Priority Inheritance Protocol, Highest Locker Protocol, Priority Ceiling Protocol, Handling Task dependencies – Scheduling Real-Time Tasks in Multiprocessor and Distributed Systems – Resource Reclaiming in Multiprocessor Real-Time Systems – Fault-Tolerant Task Scheduling in Multiprocessor Real-Time Systems.

Unit III

Real-Time Operating System (RTOS): Features of RTOS, Commercial Real-Time Operating Systems, Real-Time Databases: Applications, Design issues, Characteristics of Temporal Data, Concurrency control, Commercial Real-Time Databases.

Unit IV

Real-Time Communication in Wide Area Networks:- Introduction, Service and Traffic Models and Performance Requirements, Resource Management, Switching Subsystem, Route Selection in Real-Time Wide Area Networks:- Basic Routing Algorithms, Routing during Real-Time Channel Establishment, Route Selection Approaches, Dependable Real-Time Channels.

Unit V

Real-Time Communication in a LAN – Soft Real-Time Communication in a LAN – Hard Real-Time Communication in a LAN – Bounded Access Protocols for LANs – Real-Time Communications over Packet Switched Networks – QoS requirements – Routing and Multicasting.

Text Books

1. Rajib Mall, Real-Time Systems Theory and Practice, Pearson Education, India, 2007.
2. C. Siva Ram Murthy and G. Manimaran, Resource Management in Real-Time Systems and Networks, Prentice-Hall of India, 2005.

Reference Books

1. Jane W.S. Liu, Real-Time Systems, Pearson Education, 2006.
2. Stuart Bennelt, Real time computer control – and introduction, Pearson Education, 2003.
3. C. M. Krishna and Kang G Shin, Real time systems, McGraw-Hill, 1997.

IT E82 DATA MINING AND WAREHOUSING

Unit I

Introduction: Definition of data mining - data mining vs query tools – machine learning – taxonomy of data mining tasks – steps in data mining process – overview of data mining techniques.

Unit II

Data Warehousing :Definition – Multidimensional Data Model – Data Cube – Dimension Modelling– OLAP Operations – Warehouse Schema – Data Warehouse Architecture – Data Mart – Meta Data – Types of Meta Data – Data Warehouse Backend Process –
Development Life Cycle.

Unit III

Data Pre-Processing And Characterization :Data Cleaning – Data Integration and Transformation – Data Reduction –Discretization and Concept Hierarchy Generation – Primitives – Data Mining-Query Language – Generalization – Summarization – Analytical Characterization and Comparison - Association Rule – Mining Multi Dimensional data from Transactional Database and Relational Database.

Unit IV

Classification: Classification – Decision Tree Induction – Bayesian Classification – Prediction – Back Propagation – Cluster Analysis – Hierarchical Method – Density Based Method – Grid Based Method – Outlier Analysis.

Unit V

Cluster analysis: Types of data – Clustering Methods – Partitioning methods – Model based clustering methods – outlier analysis.

Advanced topics: Web Mining – Web Content Mining – Structure and Usage Mining – Spatial Mining – Time Series and Sequence Mining – Graph Mining

Applications : Case studies in Data Mining applications

Text Books

1. Paulraj Ponnaiah, Data Warehousing Fundamentals, Wiley Publishers, 2001.
2. Jiawei Han, Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufman Publishers, 2006.

Reference Books

1. Usama M.Fayyad, Gregory Piatetsky Shapiro, Padhrai Smyth, Ramasamy Uthurusamy, Advances in Knowledge Discover and Data Mining, The M.I.T. Press, 2007.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit, John Wiley and Sons Inc., 2002.
3. Alex Berson, Stephen Smith, Kurt Thearling, Building Data Mining Applications for CRM, Tata McGraw Hill, 2000.
4. Margaret Dunham, Data Mining: Introductory and Advanced Topics, Prentice Hall, 2002.
6. Daniel T. Larose John Wiley & Sons, Hoboken, Discovering Knowledge in Data: An Introduction to Data Mining, New Jersey, 2004.
7. Hand, Mannila and Smyth, Principles of Data Mining, Prentice Hall of India, New Delhi, 2004.
8. Dunham , Data Mining- Introductory and Advanced Topics, Pearson Education, New Delhi, 2003.
9. Arun K Pujari, Data Mining Techniques, Universities press India Pvt Ltd, New Delhi, 2002.
10. Trevor Hastie, Robert Tibshirani, Jerome Friedma, The Elements of Statistical Learning: Data Mining, Inference and Prediction, Prentice Hall, New Delhi, 2002.

IT E83 NATURAL LANGUAGE PROCESSING

Unit I - Introduction

Introduction - Issues and difficulties in NLP – Study of language – Evaluating Language understanding Systems – the different levels of language – representations – Organization of NLP systems – Linguistic issues – Types of NLP Systems.

Unit II - Grammars and Parsing

Language Hierarchies and Complexity -Grammars and sentence structures – A top down parser – a bottom up chart parser – top down chart parsing – Finite state models and morphological analysis and the Lexicon – Grammars and Logic programming – Augmented grammars – A simple grammar with features – Parsing with features – Augmented Transition Networks (ATN) – Definite clause grammars – Efficient parsers – Shift reduce parsers – A deterministic parsers - Lexicalised and Probabilistic Parsing.

Unit III - Semantic Interpretation:

Three System types of Semantics and logical forms – Defining semantic structure: Model theory – Semantic interpretation and composability –A simple grammar and lexicon with semantic interpretation – Prepositional phrases and verb phrases – Lexicalised semantic interpretation and semantic roles – Semantic networks – Frames and scripts- Truth, Meaning and Ontology – Word Net.

Unit IV - Language Communication:

Adding Language - Modeling reference – Defining Local Discourse context and Discourse entities – The need for discourse structure – Discourse interpretation – Pragmatics.

Unit V - Typical Systems:

Generation – Strategies for generation – Planning English referencing expression Architecture of Natural Language Generation System – Typical systems – ELIZA-Baseball – GUS – PARRY – LADDER – SOPHIE &POET –Current trends in NLP.

Text Books:

1. James Allen “Natural Language Understanding”, Benjamin / Cummings Publishing Co., 1995.
2. Ronald Hausser “Foundations of Computational Linguistics”, Springer-Verleg, 1999.

References:

1. Gerald Gazer and Chris Mellish, “Natural Language Processing for PROLOG programmers” – PHI –1995.
2. Ashkar Bharathi, Vineet chaitanya and Rajeev Sangal, “Natural Language Processing – a Paining Perspective” –PHI-1995.
3. Ralph Grishman, “Computational Linguistics – an introduction”, Cambridge university press – 1986.
4. Gros, Jones and Webber, “Readings in Natural Language Processing”, Morgan Konfmann publishers, 1986.
5. Popov, “talking with computers in Natural Language”- Springer – Verlag – 1986.
6. E.Reiter and Robert Date “Building Natural Language Generation Systems” Cambridge University Press, 2000.
7. Daniel Jurafsky and James, H. Martin, Speech and Language Processing: An Introduction to Natural Language Processing Computational Linguistics, and Speech Recognition, Prentice-Hall, 2000.
8. Christopher Manning and Hinrich Schutze, Foundations of Statistical Natural Language Processing, MIT Press, 1999,

IT E84 ENTERPRISE RESOURCE PLANNING

Unit I – Introduction to ERP

Integrated Management Information–Seamless Integration – Supply Chain Management – Integrated Data Model – Benefits of ERP – Business Engineering and ERP – Definition of Business Engineering – Principle of Business Engineering – Business Engineering with Information Technology.

Unit II –Business Modeling For ERP

Building the Business Model – ERP Implementation – An Overview – Role of Consultant, Vendors and Users – Customisation – Precautions – ERP Post Implementation Options–ERP Implementation Technology –Guidelines for ERP Implementaion.

Unit III –ERP and the Competitive Advantage

ERP domain MPGPRO – IFS/Avalon – Industrial and Financial Systems – Baan IV SAP –Market Dynamics and Dynamic Strategy.

Unit IV – Commercial ERP Package

Description – Multi-Client Server Solution – Open Technology – User Interface– Application Integration.

Unit V – Architecture

Basic Architectural Concepts – The System Control Interfaces – Services – Presentation Interface – Database Interface.

Text Books

1. Vinod Kumar Garg and N.K.Venkita Krishnan, Enterprise Resource Planning – Concepts and Practice, PHI, 2004.

Reference Books

1. Jose Antonio Fernandz, The SAP R/3 Handbook, TMH, 2005.

IT E85 SOFTWARE PROJECT MANAGEMENT

Unit I

Software Process: Process Maturity – Capability Maturity Model (CMM) – KPA Project Management, Variations in CMM - Productivity improvement process.

Unit II

People Management: Organization structure – Difficulties in people management - Effective team building – Role of Project manager - Team structures – Comparison of different team structures.

Software Metrics: Role Of Metrics In Software Development - Project Metrics – Process Metrics – Data Gathering - Analysis Of Data For Measuring Correctness, Integrity, Reliability And Maintainability Of Software Products.

Unit III

Project Management And Planning: Project initiation – standard process, Process Tailoring - Feasibility study - Planning – Estimation - Resource allocation The project Plan – Software Development Process – Defects – Finding Defects – Code Review Checklist – Projecting Defects

Inspection And Review: Need- Process of Inspection- SRS- Design Document Inspection.

Unit IV

Project Scheduling And Tracking: Scheduling - Critical path – Tracking - Timeline chart – Earned value chart.

Software Configuration Management: Baselines - Software configuration items -The SCM process - Version control - Change control - Configuration audit - SCM standards.

Unit V

Working Capital Policy: Importance of Working Capital Management – Risk- Risk analysis and management – Types of Risk involved - RMM plan- Return Tradeoff for Current Asset Investments – Financing Current Assets – The Costs and Risks of Alternative Debt Maturities.

Quality Planning: Quality process - Quality control –Defect preventive process- Total Quality Management.

Text Books

1. Pankaj Jalote, Software Project Management in Practice, Pearson Education, New Delhi, 2002.
2. Krish Rangarajan and Anil Misra, Working Capital Management, Excel Book, New Delhi, 2005.

Reference Books

1. Watts Humphrey, Managing the Software Process, Pearson Education, New Delhi, 2005.
2. Roger S Pressman, Software Engineering – A Practitioner’s Approach, McGraw Hill International Edition, Singapore, Sixth Edition, 2007.
3. Hughes, Software Project Management, Tata McGraw-Hill, 2004.

IT E86 HIGH SPEED NETWORKS

Unit I - ISDN and Frame Relay

Introduction to High Speed networks, Basics: OSI/ISO reference model, ISDN: Conceptual view – Standards – Transmission structure – BISDN - Frame Relay: Frame mode protocol architecture – Call control – LAPF – Congestion – Traffic rate management – Explicit congestion avoidance – Implicit congestion control.

Unit II - Asynchronous Transfer Mode

Asynchronous transfer mode - ATM Protocol Architecture, ATM logical Connection, ATM Cell - ATM Service Categories – AAL - Traffic and Congestion control in ATM - Requirements - Attributes - Traffic Management Frame work, Traffic Control – ABR traffic Management - ABR rate control, RM cell formats, ABR Capacity allocations - GFR traffic management.

Unit III - Congestion Control and QOS in IP Networks

Congestion Control in Packet Switching Networks: The Need for Flow and Error Control – Link Control Mechanisms – ARQ Performance – TCP Flow Control – TCP Congestion Control – Performance of TCP Over ATM – Integrated Services Architecture – Queuing Discipline – Random Early Detection – Differentiated Services – Resource Reservation : RSVP – Multi protocol Label Switching – Real Time Transport Protocol.

Unit IV - WDM Optical Networks

Introduction to Optical Networks – Wavelength Division Multiplexing (WDM) – Introduction to broadcast and select networks – switch architectures – channel accessing – Wavelength routed networks – switch architectures – Routing and wavelength assignment – Virtual topology design – IP over ATM over WDM – IP over WDM.

Unit V - SONET and SDH

High Speed LAN's: Fast Ethernet – Switched fast Ethernet - Gigabit Ethernet – FDDI: Network configuration – Physical Interface – Frame transmission and reception – SONET: Introduction – Layers – Frames – STS multiplexing – SONET networks – Virtual tributaries - Payload mappings – Packet over SONET – Generic Framing Procedure – Transport services – SONET over WDM – Traffic Grooming.

Text Books

1. William Stallings, ISDN and Broadband ISDN with Frame Relay and ATM, Fourth Edition, PHI, 2004. (Unit I)

2. William Stallings, High Speed Networks and Internets, Pearson Education, Second Edition, 2002. (Unit II and Unit III)

3. C.Siva Ram Murthy and Mohan Gurusamy, WDM Optical Networks: Concepts, Design and Algorithms, PHI, 2002. (Unit IV and Unit V)

4. Fred Halsall, Multimedia Communications – Applications, Networks, Protocols, Pearson Edition, 2001. (Unit V)

Reference Books

1. Greg Bemstein, Bala Rajagopalan, Debanjan Saha, Optical Network control – Architecture, Protocols and Standards, Pearson Education, 2004.

2. Behrouz A Forouzan, Data Communications and Networking, TMH, Fourth Edition, 2006.

3. Behrouz A. Forouzan and Sophia Chung Fegan, Local Area Networks, THH, 2001.

4. Rajiv Ramaswami and Kumar N. Sivarajan, Optical Networks: A Practical Perspective, 2nd Edition, Morgan Kaufmann (Elsevier Indian Edition), 2004. (Unit IV and Unit V)

5. Uless Black, Optical Networks, Third generation transport systems, Pearson Education, 2002.

IT E87 VLSI DESIGN

Unit I

VLSI Circuits and Basic Electrical Properties of MOS and Bi CMOS Circuits: NMOS, CMOS and Bi CMOS fabrication- p well, n well and twin tub process – comparison between CMOS and Bipolar technology – Electrical parameters – pull up to pull down ratio – Device modeling.

Unit II

MOS and Bi CMOS Circuit Design Process and Scaling: MOS layers – stick diagrams – design rules and layout – inverter delays – propagation delays – wiring capacitances – choice of layers – scaling models and scaling factors for device parameters – limitations of scaling.

Unit III

VLSI Logic Circuits, Design Process And Layouts: Pass transistor and Transmission gates – inverter – NAND gates and NOR gates for n MOS, CMOS and Bi CMOS – parity generator – multiplexers – code converters – PLA – clocked sequential circuits – 4 bit adder – multiplexers – design of ALU – memories – registers.

Unit IV

Ultra Fast VLSI Circuits And Programmable ASIC's: Ultra fast systems – GaAs crystal structure – GaAs fabrication – device modeling and performance estimation (only GaAs) Antifuse and SRAM Practical issues – FPGA economics, programmable logic cells, Actel ACT1, ACT2 and ACT3 – Xilinx LCA, Ultra FLEX and Ultra
MAX.

Unit V

An Introduction to HDL, Verilog And VHDL: Verilog: Basics of Verilog, operators, hierarchy procedures and assignments, timing controls and delays, tasks and functions, control statements. VHDL: Syntax and semantics, identifiers and literals, entities and architectures, packages and libraries interface, type and other declarations, sequential statements, operators, arithmetic operators, VHDL and logic synthesis, Verilog and logic synthesis.

Text Books

1. David Pucknel, Basic VLSI design, Second Edition PHI, 2001.
2. Sebastian Smith, Application Specific Integrated circuits, Pearson Education 2001.
3. Navabi,VHDL analysis and modeling of digital systems,Mc Graw Hill 1993.

Reference Books

1. Fabious E, Introduction to VLSI design, Mc Graw Hill, 1990.
2. Neil Weste E.Kamroon Eshragian, Principles of CMOS VLSI design, Addison Wesley,1998.
3. Carver Meact Lynn Conway, Introduction to VLSI systems, Addison Wesley, 1980.
4. Amar Mukherjee, Intoduction to NMOS and CMOS VLSI system design, PHI, 1986.

IT E88 C# AND .NET FRAMEWORK

Unit I

Introduction to the .NET Platform – Common Language Runtime(CLR) – The Common Type Specification(CTS) – The Common Language Specifications (CLS) – Assemblies - .NET Base Classes – CLR Debugger.

Unit II

Introduction to C# - Data Type – Operators – Flow Control and Iteration – Arrays and Strings – Basics of C# Classes – Boxing and Unboxing – Reflection – Interoperability – The Preprocessors – Attributes – Name Spaces.

Unit III

Object-Oriented Programming in C# - Encapsulation, Inheritance , and Polymorphism – Exception Handling – Garbage Collection – Input and Output (Directories ,Files, and Streams).

Unit IV

Implementing the IC1oneable and IComparable Interfaces – Introduction to .NET Collections (including Custom Collections) – Custom Indexers, Delegates and Events – Multithreading and Synchronization – Type Reflection and Attributes – Programming the Windows Registry.

Unit V

GDI+ Graphics Tutorial(including Fonts, Brushes, Images, and using .NET Resources) – COM, COM+, and .NET Interoperability – ADO.NET for Database Programming with Datasets and Object Model. – Windows Applications: Winforms – Winforms Namespace – Creating Winforms Applications in VS.NET – Distributed applications with .NET - .NET remoting architecture - .NET and .COM – Marshalling - Deployment.

Text Books

1. Robert J.Oberg, Introduction to C# using .NET , PHI, 2002.
2. Andrew Troelsen, C# and .NET Platform , Apress, 1st edition, 2001.
3. E.Balagurusamy, Programming in C# , Tata McGraw Hill, 2002.

Reference Books

1.Ben Albahari, Peter Drayton and Brad Merrill , C# Essentials,SPD,2001.

2. Microsoft, C# Language Specifications , WP Publishers and Distributors Pvt.Ltd., 2001.

3. Simon Robins on Christian Nagel, Karli Watson, Jay Gltnn, Morgan skinner, Bill Evjen, Professional C# , Wiley Dreamtech, 3rd edition, 2004.

4. David S. Platt, Introducing Microsoft .NET , Microsoft Press, 3rd edition, 2003.

IT E89 GRID COMPUTING

UNIT I

IT Infrastructure Evolution: Introduction - Microprocessor Technology –Optical Networking Technology –Storage Technology -Wireless Technology - Sensor Technology -Global Internet Infrastructure -World Wide Web and Web Services -Open-Source Movement - Conclusion - Productivity Paradox and Information Technology- Introduction -Productivity Paradox -Return on Technology Investment -Multi-Story Bureaucracy - Information Technology Straightjacket - Consolidation -Outsourcing -Toward a Real-Time Enterprise--Operational Excellence - Conclusion- Business Value of Grid Computing-Introduction -Grid Computing Business Value Analysis -Risk Analysis - Grid Marketplace -Conclusion –Grid Computing Technology Overview.

UNIT II

The Open Grid Services Architecture: Introduction -An Analogy for OGSA - The Evolution to OGSA -OGSA Overview -Building on the OGSA Platform -Implementing OGSA-Based Grids - Conclusion - Creating and Managing Grid Services -Introduction -Services and the Grid - Converting Existing Software -Service Discovery - Operational Requirements - Tools and Toolkits -Support in UDDI - UDDI and OGSA - UDDIe: UDDI Extensions and Implementation - Uses - Quality of Service Management -Conclusion

UNIT III

Desktop Grids -Introduction -Background -Desktop Grids Defined - The Desktop Grid Value Proposition -Desktop Grid Challenges -Desktop Grid Technology-Key Elements to Evaluate - Desktop Grid Suitability-Key Areas for Exploration - The Grid Server-Additional Functionality to Consider - Role of Desktop Grids in an Enterprise Computing Infrastructure - Practical Uses of Desktop Grids--Real-World Examples -Conclusion- Cluster Grids- Introduction – Clusters-Industry Examples-Cluster Grids -Conclusion Data Grids- Introduction -Data Grids -Alternatives to Data Grids - Avaki Data Grid - Data Grid Architecture –Conclusion

UNIT IV

Desktop Supercomputing- Native Programming for Grids - Introduction - Historical Background--Parallel Computing -Parallel Programming Paradigms -Problems of Current Parallel Programming Paradigms -Desktop Supercomputing: Solving the Parallel Programming Problem -Desktop Supercomputing Programming Paradigm - Parallel Programming in CxC - Parallelizing Existing Applications -Conclusion -Grid Enabling Application- Software Applications - Introduction - Grid Computing: Discontinuous Innovation or Massive Yawn -The Needs of Grid Users - Grid Deployment Criteria -Methods of Grid Deployment - When to Grid-Enable Software - Requirements for Grid-Enabling Software - Grid Programming Tools and Expertise -The Process of Grid-Enabling Software Applications -Grid-Enabling a Mainstream Software Application: An Example – Conclusion- Application Integration-Introduction - Application Classification -Grid Requirements -Integrating Applications with Middleware Platforms –Conclusion.

UNIT V

Grid Enabling Network Services- Introduction - On Demand Optical Connection Services - Creating Grid-Enabled Network Services - Montague River Grid -Montague River Domain - Sample API - Deployment Example: End-to-End Light Path Management –Conclusion Managing Grid Environments- Introduction - Managing Grids -Management Reporting -Monitoring - Service Level Management - Data Catalogs and Replica Management -Portals –Conclusion.

Grid Computing Toolkit: Globus GT3 Toolkit-Architecture-Programming Model- Sample Implementation- High level Services.

Case Studies: Sun Grid Engine – National Grid Project – Garuda.

TEXTBOOK

1. Ahmar Abbas, Grid Computing: A Practical Guide to Technology and Application, Charles River Media, 2005.

REFERENCES

1. Joshy Joseph and Craig Fellenstein, Grid Computing, Pearson Education, 2003.
2. Ian Foster and Carl Kesselman, The Grid2: Blueprint for a New Computing Infrastructure, Morgan Kaufman, 2004.