

**ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS**

**COMPUTER SCIENCE AND
SYSTEMS ENGINEERING**

For

B.TECH FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2002-2003)



**JAWAHARLAL NEHRU
TECHNOLOGICAL UNIVERSITY**
KUKATPALLY, HYDERABAD - 500 072.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

B.Tech. (Regular) Four Year Degree Course (Revised) Academic Regulations

(Effective for the students studying I year
from the Academic Year 2002-2003 and onwards)

1. Award of B.Tech. Degree:

A student will be declared eligible for the award of the B.Tech. Degree if he fulfills the following academic regulations:

- i. He has pursued a course of study for not less than four academic years and not more than eight academic years.
- ii. He has registered for and studied all the subjects for a total of 212 credits and secured all the 212 credits.
2. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in the course and their seat shall stand cancelled.

3. Courses of study:

The following courses of study are offered at present for specialization for the B.Tech. Degree:

1. Aeronautical Engineering
2. Bio-Medical Engineering
3. Bio-Technology
4. Chemical Engineering
5. Civil Engineering
6. Computer Science and Engineering
7. Computer Science and Systems Engineering

8. Electrical and Electronics Engineering
9. Electronics and Communication Engineering
10. Electronics and Computer Engineering
11. Electronics and Control Engineering
12. Electronics and Instrumentation Engineering
13. Electronics and Telematics Engineering
14. Information Technology
15. Instrumentation and Control Engineering
16. Mechanical (Mechatronics) Engineering
17. Mechanical (Production) Engineering
18. Mechanical Engineering
19. Metallurgical Engineering
20. Metallurgy and Material Technology

and any other course as approved by the authorities of the University from time to time.

4. Credits:

	Semester Pattern		Yearly Pattern	
	Periods / Week	Credits	Periods / Week	Credits
Theory	04	04	03	06
Practicals	03	02	03	04
Practicals	06	04	06	08
Project	08	08	—	—

5. Distribution and Weightage of Marks:

- i. The performance of a student in each semester / I year shall be evaluated subject -wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, project shall be evaluated for 200 marks.
- ii. For theory subjects the distribution shall be 20 marks for Internal Evaluation and 80 marks for the End-Examination.

- iii. For theory subjects, there shall be 5 objective type tests for a duration of 20 minutes each during the semester. Each test shall contain 20 objective type questions for 20 marks. The best 4 tests will be considered for awarding 20 sessionals marks. For the I year class which shall be on yearly basis, there shall be 6 tests of the same duration and weightage as mentioned above. However, the performance in the best 4 tests will be considered for awarding 20 sessional marks.
- iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 End Examination marks. Of the 25 marks for internal, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned and another member of the staff of the same department of the same institution.
- v. For the subject having design and / or drawing, and estimation, the distribution shall be 20 marks for internal evaluation (10 marks for day-to-day work and 10 marks for internal tests). There shall be two internal tests in a Semester and the better of the two will be taken into consideration. However in the I year class, there shall be three tests and the best two will be taken into consideration for a maximum of 20 marks. The End Examination shall be for a total of 80 marks.
- vi. The Engineering Drawing Practice Course wherever offered is to be treated as a practical course. Evaluation method adopted for practicals shall be followed here also.
- vii. Out of a total of 200 marks for the project work, 40 marks shall be for Internal Evaluation and 160 marks for the End Semester Examination. The End Semester Examination (viva-voce) shall be conducted by a board of examiners consisting of Guide, Head of the Department and an external examiner. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.
- viii. Laboratory marks and the sessional marks awarded by the College are not final. They are subject to scrutiny and scaling by the University wherever felt desirable. The uniform distribution of awarding of Sessional marks and Laboratory marks will be referred to a Committee. The Committee will arrive at a scaling factor and

the marks will be scaled as per the scaling factor. The recommendations of the Committee are final and binding. The laboratory records and internal test papers shall be preserved in the respective departments as per the University norms and shall be produced to the Committees of the University as and when they visit the College.

6. Attendance:

- i. A student has to put in a minimum of 75% of attendance in aggregate of all the subjects for acquiring credits in the I year and / or each semester thereafter.
- ii. Condonation of shortage of attendance in aggregate upto 10% (65% and above and below 75%) in each semester or I year may be granted by the College Academic Committee.
- iii. A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester / I year.
- iv. Shortage of Attendance below 65% in aggregate shall in no case be condoned.
- v. Students whose shortage of attendance is not condoned in any semester / I year are not eligible to take their end examination of that class and their registration shall stand cancelled. They may seek re-admission for that semester / I year when offered next.
- vi. Condonation of shortage of attendance as stipulated in 6 (ii) above shall be granted on genuine and valid grounds with supporting evidence.
- vii. A stipulated fee shall be payable towards condonation of shortage of attendance.

7. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no. 6.

- i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.

- ii. A student shall successfully complete all the I year subjects from 3 regular consecutive examinations and 3 supplementary consecutive examinations of I year from the date of admission. If he has failed to do so he shall forfeit the seat in course and his seat shall stand cancelled.
- iii. A student shall be promoted from II to III year only if he fulfils the academic requirement of 56 credits from the consecutive regular and supplementary examinations of I year and from the regular examination of II year I semester irrespective of whether the candidate takes the examination or not.
- iv. A student shall be promoted from third year to fourth year only if he passes all the subjects of I year and fulfils the academic requirements of total 100 credits (including 56 credits of I year) from the examinations,
 - a. Two regular and Two supplementary examinations of I year.
 - b. Two regular and one supplementary examinations of II Year I Semester
 - c. One regular and one supplementary examinations of II Year II Semester
 - d. One regular III year I Semester examination.
- v. A student shall earn all the 212 credits offered as indicated in the course structure.
- vi. Students who fail to earn all the 212 credits offered as indicated in the course structure within eight academic years from the year of their admission shall forfeit their seat in the course and their seat shall stand cancelled.

8. Withholding of Results:

The result of a student shall be withheld if:

- i. He has not cleared any dues to the Institution / Hostel;
- ii. A case of disciplinary action against him is pending disposal;

9. Course pattern:

- i. The entire course of study is of four academic years. The first year shall be on yearly pattern and the second, third and fourth years on semester pattern.

- ii. A student eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.

10. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the programme and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

First Class with Distinction	70% and above	
First Class	Below 70% but not less than 60%	From the aggregate marks secured for 212 Credits.
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

11. Minimum Instruction Days:

The minimum instruction for each semester / 1 year shall be 90/180 working days excluding examination days.

12. There shall be no branch transfers after the completion of admission process.
13. There shall be no place transfer within the Constituent Colleges of Jawaharlal Nehru Technological University for B.Tech. Regular / FDH / CCC and P. G. Programmes.

General:

14. Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".
15. The academic regulation should be read as a whole for the purpose of any interpretation.
16. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.
17. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the University.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

Academic Regulations for B. Tech. (Lateral Entry Scheme)

(Effective for the students getting admitted into II year from the Academic Year 2003-2004 and onwards)

1. The Students have to acquire 156 credits from II to IV year of B.Tech. Programme (Regular) for the award of the degree.
2. Students, who fail to fulfill the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.
3. The same attendance regulations are to be adopted as that of B. Tech. (Regular).
4. Promotion Rule:

A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of 44 credits from the examinations following

- a. Two regular and one supplementary examinations of II Year I Semester
- b. One regular and one supplementary examinations of II Year II Semester
- c. One regular III year I Semester examination

5. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the programme and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

I YEAR B.TECH

COMPUTER SCIENCE & SYSTEMS ENGINEERING

COURSE STRUCTURE

Code	Subject	T	P	C
CSS1021	English	3	-	6
CSS1022	Mathematics-I	3+1*	-	6
CSS1023	Solid State Physics	2+1*	-	4
CSS1024	Information Technology & Numerical Methods	3	-	6
CSS1025	C & Data Structures	3	-	6
CSS1026	Network Theory	3	-	6
CSS1027	Electronics Devices and Circuits	3	-	6
CSS1028	Engineering Drawing and Practice	-	3	4
CSS1029	Computer Programming Lab	-	6	8
CSS1030	Electronics Devices and Circuits Lab	-	3	4
		20+2*	12	56

* tutorial

First Class with Distinction	70% and above	From the aggregate marks secured for 156 Credits. (i.e II year to IV year)
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

6. All other regulations as applicable for B. Tech. Four-year degree course (Regular) will hold good for B. Tech. (LES)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

2002-2003

II YEAR B.TECH I SEMESTER

COMPUTER SCIENCE AND SYSTEMS ENGINEERING

COURSE STRUCTURE

Code	Subject	T	P	C
CSS2121	Mathematics - II	4	-	4
CSS2122	Discrete Structures and Graph Theory	4	-	4
CSS2123	Linear and Digital Applications	4	-	4
CSS2124	Switching Theory and Logic Design	4	-	4
CSS2125	Design and Analysis of Algorithms	4	-	4
CSS2126	Object Oriented Programming (through Java)	4	-	4
CSS2127	IC Applications Lab	-	3	2
CSS2128	OOPS Lab through Java	-	3	2
		24	6	28

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2002-2003

II YEAR B.TECH II SEMESTER

COMPUTER SCIENCE AND SYSTEMS ENGINEERING

COURSE STRUCTURE

Code	Subject	T	P	C
CSS2221	Probability & Statistics	4	-	4
CSS2222	Electrical Technology	4	-	4
CSS2223	Operating Systems	4	-	4
CSS2224	Computer Organization	4	-	4
CSS2225	Managerial Economics and Financial Analysis	4	-	4
CSS2226	Database Management Systems	4	-	4
CSS2227	Database Management Systems Lab	-	3	2
CSS2228	Operating Systems Lab	-	3	2
		24	6	28

2002-2003
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III YEAR I SEMESTER
COMPUTER SCIENCE AND SYSTEMS ENGINEERING
COURSE STRUCTURE

Subject Code	Subject	T	P	C
CSS3121	Principles of Programming Languages	4	-	4
CSS3122	Interfacing through Microprocessors	4	-	4
CSS3123	Theory of Computation	4	-	4
CSS3124	Systems Programming	4	-	4
CSS3125	Management Science	4	-	4
CSS3126	Data Communications	4	-	4
CSS3127	Interfacing through Microprocessors Lab	-	3	2
CSS3128	Systems Programming Lab	-	3	2
		24	6	28

2002-2003
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III YEAR II SEMESTER
COMPUTER SCIENCE AND SYSTEMS ENGINEERING
COURSE STRUCTURE

Subject Code	Subject	T	P	C
CSS3221	Computer Networks	4	-	4
CSS3222	Software Engineering	4	-	4
CSS3223	Advanced Computer Architecture	4	-	4
CSS3224	Mathematical Modeling and Simulation	4	-	4
CSS3225	Fault Tolerant Systems	4	-	4
CSS3226	Advanced Unix Programming	4	-	4
CSS3227	Advanced Unix Programming Lab	-	3	2
CSS3228	Computer Networks Lab	-	3	2
		24	6	28

2002-2003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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IV YEAR I SEMESTER

COMPUTER SCIENCE AND SYSTEMS ENGINEERING

COURSE STRUCTURE

Subject Code	Subject	T	P	C
CSS4121	Performance Evaluation of Computer Systems	4	-	4
CSS4122	Computer Systems Maintenance	4	-	4
CSS4123	Network Administration	4	-	4
CSS4124	Computer Graphics	4	-	4
	Elective-I:			
CSS4125	VLSI Systems Design			
CSS4126	Distributed Operating Systems			
	Elective-II:	4	-	4
CSS4127	Embedded Systems			
CSS4128	Real Time Systems			
CSS4129	Computer systems Maintenance Lab	-	3	2
CSS4130	Computer Graphics Lab	-	3	2
		24	6	28

2002-2003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV YEAR II SEMESTER

COMPUTER SCIENCE AND SYSTEMS ENGINEERING

COURSE STRUCTURE

Subject Code	Subject	T	P	C
	Elective-III:			
CSS4221	Advanced Databases	4	-	4
CSS4222	Multimedia Systems			
	Elective-IV:			
CSS4223	Data mining and Data ware housing			
CSS4224	Cellular and Mobile Communications			
CSS4225	Project Work			8
		8	-	16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I.B.TECH.

3 - 0 - 6

CSS1021

ENGLISH
(Common for all branches)

The following text books of English are prescribed for I.B.Tech class of all branches in the Colleges of Engineering and Technology affiliated to Jawaharlal Nehru Technological University, Hyderabad. The exercises given are expected to be covered by the teacher in the classroom, the objective of the course being the development of linguistic skills of the learners.

1. A textbook of English for Engineers and Technologists, OL.
2. Masterminds, OL.

UNIT I:

1. Energy, Unit 3: Alternative Sources (from A textbook of English for Engineers and Technologists, OL).
2. Jagadish Chandra Bose, (a profile from The Trail Blazers in Masterminds, OL).

UNIT II:

1. Computers, Unit 2: New Frontiers (from A textbook of English for Engineers and Technologists, OL).
2. Chandrasekhara Venkata Raman (a profile from the World of Figures and Physics in Masterminds, OL).

UNIT III:

1. Technology, Unit 3: Evaluating Technology (from A Text book of English for Engineers and Technologists, OL).
2. S. S. Bhatnagar (a profile from the Institution Builders in Masterminds, OL).

UNIT IV:

1. Environment, Unit I: Pollution (from A Text book of English for Engineers and Technologists, OL).
2. Homi Jehangir Bhabha (a profile from the New Age in Masterminds, OL).

UNIT V:

1. Industry, Unit 2: Safety and Training (from A Text book of English for Engineers and Technologists, OL).
2. Salim Ali (a profile from The Living World in Masterminds, OL).

UNIT VI:

Common Errors, Sentence Completion, Synonyms and Antonyms, Analogy, Report Writing, Comprehension, General Essay, Situational Dialogues

Note:

The establishment of an English Language laboratory in each Affiliated College of Engineering and Technology is recommended with effect from the Academic year 2002-03 for the following reasons:

1. To expose the students to TOEFL and GRE model of training and practice.
2. To help the students learn correct pronunciation, accent and intonation.
3. To enable the students to improve and strengthen their communicative skills.
4. To expose the students to different variations in English expression.

It is also recommended that the English Language Laboratory training and practice is treated as a non-examination item of the curriculum.

Books Recommended:

1. Strengthen your writing, by V. R. Narayana Swami (OL).
2. Success with Grammar and Composition, by K. R. Narayanaswamy (OL).
3. Examine your English, by Margaret Maison (OL).

4. English for Professional Students, by S. S. Prabhakara Rao.
5. TOEFL (ARCO & BARRONS, USA) & CLIFFS TOEFL.
6. GRE (ARCO & BARRONS, USA) & CLIFFS GRE.
7. Communication skills for Technical Students by T. M. Farhathulla (OL).
8. Strategies for Engineering Communication by Susan Stevenson & Steve Whitmore (John Wiley & Sons).
9. Basic Communication skills for technology, 2 nd edition by Andrea J. Rutherford, (Pearson Education Asia).

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

I.B.TECH.

3+1* - 0 - 6

CSS1022

MATHEMATICS - I
(Common to all Branches)

UNIT - I:

Sequences – Series – Convergence and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence.
 Rolle's theorem – Lagrange's Mean Value theorem – Cauchy's Mean value Theorem – Generalized Mean Value theorem (Taylor's Theorem)

UNIT - II:

Functions of several variables – limit and continuity – partial differentiation – Chain rule – Total derivative – Euler's theorem, Jacobian – Functional dependence. Maxima and Minima of functions of two variables with and without constraints, Radius, Centre and Circle of Curvature – Evolutes and Envelopes.

UNIT - III:

Curve tracing – Cartesian, polar and Parametric curves. Applications of integration to lengths, volumes and surface areas in Cartesian and Polar coordinates.

UNIT - IV:

Differential equations of first order and first degree – formation. Exact, linear and Bernoulli.
 Applications to Newton's Law of cooling, Law of natural growth and decay, Orthogonal trajectories, Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax} , $\sin ax$, $\cos ax$, polynomial in x , $e^{ax} V(x), xV(x)$, method of variation of parameters.

UNIT - V :

Laplace transform of standard functions – Inverse transform – Linearity – first shifting Theorem. Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Differentiation and integration of transforms – Multiple integrals : Double and triple integrals – change of variables – Change of order of integration.

UNIT - VI :

Vector Differential Calculus : Gradient, Divergence, Curl and their related properties of sums, Products, Laplacian and second order operators. Vector integral Calculus : Vector integration – Line integral – work done – Potential function – area, surface and volume integrals. Green's theorem, Stoke's and Gauss' Divergence Theorem. Verification of Green's, Stoke's and Gauss' Theorems. Curvilinear Coordinates – Cylindrical, Spherical Coordinates – Expressions of Grad, div, curl in Spherical, Cylindrical and Curvilinear Coordinates.

TEXT BOOKS :

1. A Text Book of Engineering Mathematics Volume – I, 2002 T.K.V. Iyengar, B. Krishna Gandhi, and others, S. Chand and Company
2. Engineering Mathematics B.V. Ramana, Tata McGraw_Hill 2002
3. Engineering Mathematics – I C. Sanakraiah, Vijaya Publications-2002
4. Engineering Mathematics – I - 2002 P. Nageswara Rao, Y. Narsimhulu, Prabhakara Rao

REFERENCES :

1. Engineering Mathematics S.K.V.S. Sri Rama Chary, M. Bhujanga Rao, Shankar, B.S. Publications 2000
2. Advanced Engineering Mathematics (Eighth edition) Erwin Kreyszig , John Wiley & Sons (ASIA) Pvt . Ltd. 2001
3. Advanced Engineering Mathematics (Second edition) Michael D. Green Berg, Prentice Hall, Upper saddle River, New Jersey-1998
4. Sarveswara Rao Koneru Engineering Mathematics Orient Longman Pvt. Ltd. 2002
5. Engineering Mathematics – I N.P. Bali, Laxmi Publications (P) Ltd., New Delhi

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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I B.TECH.

2+1* - 0 - 4

CSS1023

SOLID STATE PHYSICS

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, CSIT,
CSSE, ETM, ECM, BME)

UNIT – I (A):

Bonding in solids – Cohesive energy – calculation of cohesive energy of ionic solids – application to Sodium Chloride crystal.

UNIT – I (B):

Space lattice – crystal structure – unit cell – lattice parameter – crystal systems – Bravais lattices – stacking sequences, metallic crystals – simple cubic, F.C.C. and B.C.C structures- Structures of Diamond, ZnS, NaCl and CsCl systems.

UNIT – II (A):

Directions and planes in crystals – Miller Indices- distances of separation between successive hkl planes. Imperfections in crystals – point defects – Frenkel and Schottky defects – Energy of formation of a vacancy – Number of vacancies at any given temperature.

UNIT – II (B):

Line defects – Edge and Screw dislocations – Burger's vector. Diffraction of X-rays by crystal planes – Bragg's law – Laue photograph – Powder method.

UNIT – III (A): PRINCIPLES OF QUANTUM MECHANICS

Waves and Particles – de Broglie hypothesis - G.P Thompson's experiment – Davisson and Germer's experiment –

Schroedinger's wave equation (Time independent) – Physical significance of the wave function. Particle in potential box.

UNIT – III (B): ELECTRON THEORY OF METALS

Classical free electron theory – Mean free path, relaxation time and drift velocity – Fermi-Dirac distribution (non-mathematical treatment) – Quantum free electron theory of conduction scattering – Sources of electrical resistance – Kronig-Penny model (non- mathematical treatment) – Origin of energy band structure in solids – Concept of effective mass.

UNIT – IV (A): DIELECTRIC PROPERTIES

Introduction – Electronic, Ionic and Orientation polarization – Internal field – Clausius Mosotti equation – Ferro and Piezo electricity (non-mathematical treatment) – Frequency dependence of Dielectric Constant (non-mathematical treatment) – Important requirements of Insulators.

UNIT – IV (B): MAGNETIC PROPERTIES

Permeability – Magnetization – Origin of magnetic moment – Bohr magneton - Electron spin – Classification of magnetic materials – Domain theory of Ferro Magnetism – Hysteresis curve – Ferri and Anti-ferro magnetic substances – Ferrites and their applications – Requirements of magnetic materials for different purposes.

UNIT – V (A): SEMICONDUCTORS

Electrical conductivity of semiconductors – Intrinsic semiconductors – carrier concentration – Extrinsic semiconductors - carrier concentration – Minority carrier lifetime – drift and diffusion – Einstein's Equation – Equation of continuity – Hall effect.

UNIT - V (B): SUPERCONDUCTIVITY

General features – Meissner effect – Penetration depth – Type I and Type II superconductors – Flux quantization – Josephson Effect – BCS theory - Applications of superconductors.

UNIT - VI (A): LASERS

Spontaneous and Stimulated Emission – Einstein's Coefficients – Condition for Population inversion – Ruby Laser – He-Ne Laser – Semiconductor Laser – Applications of Lasers.

UNIT - VI (B): FIBRE OPTICS

Principle of Optical fibre – Step-index fibre – graded-index fibre – numerical aperture – Acceptance angle – Transmission signal in Step-index and graded-index fibre – Optical fibres in communication and sensing applications.

TEXT BOOK:

Solid State Physics – by S.O. Pillai (New Age International).

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I.B.TECH.

3 – 0 – 6

CSS1024

INFORMATION TECHNOLOGY & NUMERICAL METHODS
UNIT I:

Parts of a computer: Processor, memory, I/O devices, storage devices, operating system, application software

Types of computer systems: Supercomputer, Mainframe computer, Minicomputer, workstations, Microcomputers, Personal computers, desktop handheld computers.

Input devices: Keyboard, mouse, hand devices optical devices, audio visual devices.

Output devices: monitor, projectors, sound devices, printers, storage devices, files (Lessons 1,2,3,4,5,6,9 and 10 of text book1).

UNIT II:

Data Processing: Data representation, data processing method, data processing speed, processor power, Intel, AMD, Cyrix, Motorola, RISC processors

Operating system: User interface, program running, file management, hardware management , PC Operating Systems, Dos, Unix Windows, Windows NT

Program development: hardware/software interaction, problem to a program, structured and object oriented approaches, Programming languages, machine and high-level languages (Lessons 7,8,11,12,15, 27 and 28 of text book1)

UNIT III:

Database management: Databases, the DBMS, working with a database and enterprise software. Data communication and Networking: Use of networks, network structures, network topologies, network media, telephone lines, modems, digital telephones, Internet, working of Internet, Internet features,

Internet applications, Accessing the Internet, connecting PC to Internet, connecting to WWW.
 (Lessons 16,17,18,19 and 20 of text book1)

UNIT IV: (to be taught online through PC)

Microsoft windows ME and tools: Office 2000, Word 2000, Excel 2000, Powerpoint 2000, Access 2000, Outlook 2000, Frontpage 2000. (Chapters 4 to 25 of text book 2).

UNIT – V Numerical Methods – I

Iterative methods, bisection method, Newton Raphson method, successive approximation method, Gauss Jordan and Gauss Siedel methods; Interpolation, Lagrange interpolation forward difference, backward difference and central difference interpolation methods.

UNIT – VI Numerical Methods – II

Numerical Integration by Trapezoidal and Simpson's rules, numerical solution to differential equations, Euler algorithms, numerical solution to differential equations, Euler method, Runge kutta method, Milne predictor corrector method, predictor algorithms; Comparison of Runge kutta method and predictor corrector method; Regression techniques

Text Book(s):

1. "Introduction to Computers," Peter Norton, Tata McGraw-Hill, 4th Edition, 2001, ISBN: 0- 07-044743-8.
2. "Introduction to Computers with MS-Office 2000," Alexis Leon and Mathews Leon, Tata McGraw-Hill, 2001, 0-07-043445-X.
3. Computer oriented Numerical Methods, V. Rajaraman
4. Numerical Methods for Scientific and Engineering Computation, M. K. Jain,
 S. R. K. Iyengar, R. K. Jain, New Age International (P) Ltd.

References:

1. Using information technology – a practical introduction to computers and communication, Williams, Sawyer and Hutchins, Tata McGraw Hill, 2000
2. Computers and common sense, Shelly and Hunt;, Prentice Hall of India
3. Fundamentals of Information Technology, Alexis Leon, Mathews Leon, Leon Press and Vikas Publishing House.
4. "Using Information Technology: A Practical Introduction to Computers & communications," Brian Williams, Stacey Sawyer, and Sarah Hutchinson, Tata McGraw-Hill, 3rd Edition, 2001, ISBN: 0-07-043562-6.
5. "Upgrading and Repairing PCs", Scott Mueller, Pearson Education Asia, 13th Edition, 2002, ISBN: 81-7808-552-6.
6. "Trouble Shooting, Maintaining & Repairing PCs", Stephen J. Bigelow, Tata McGraw-Hill Publishing Company, 5th Edition, 2001, ISBN: 0-07-047367-6.
7. "Introduction to Information Technology," Efraim Turban, R. Kelly Rainer, Jr., Richard Potter, John Wiley & Sons, 2000, ISBN: 9971-51-321-8.

UNIT - I

Algorithm, flowchart, program development steps, basic structures of C language, C tokens, data types, declaration of variables, assigning values, arithmetic, relational and logical operators, increment and decrement operators, control operator, bit-wise operator, expressions, evaluation, input-output operators, IF and SWITCH statement, WHILE, DO-WHILE and FOR statements, C programs covering all the above aspects.

UNIT-II

One dimensional & Two dimensional arrays, initialisation, string variables, declaration, reading, writing, string handle function, user-defined functions variables & storage classes, example C Programs.

UNIT-III

Structure definition, initialising, assigning values, passing of structures as arguments, unions, declaring & initialising of pointers, pointer based expressions, arrays, strings, functions and structures, C Program examples, file management in C, opening & Closing, I-O operations on files.

UNIT-IV

Stacks, representing stacks in C, Infix, Postfix & Prefix programs, recursion in C, Queue & its sequential representation, circular queue, sequence.

UNIT-V

Single Linked List, Double linked list, Header, Circular List, applications; binary trees, representation, tree traversals, graph representation, graph traversals, spanning trees.

UNIT - VI

Search techniques: linear and binary search methods, sorting methods, Exchange sort, selection sort, quick sort, tree sort.

Text Books:

1. C & Data Structures, E. Balagurusamy, TMH 2002.
2. Data structures using C by A. S. Tanenbaum, PHI
3. Fundamentals of Data Structures, Horowitz & Sahani

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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I.B.TECH.

3 - 0 - 6 CSS1026

NETWORK THEORY

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, CSIT, CSSE,
ETM, ECM, BME)

UNIT - I:

Circuit concept – RLC parameters – Voltage and Current sources – Source transformation – Voltage–Current relationship for Passive elements – Kirchhoff's laws – Network Reduction Techniques – Series, Parallel, Series-Parallel, Star-to-delta or delta-to-star transformations.
Magnetic Circuits – Faraday's Laws of electromagnetic induction – Concept of self and mutual inductances – dot convention – coefficient of coupling – Composite Magnetic Circuits – Analysis of Series and Parallel Magnetic Circuits.

UNIT - II:

RMS and Average values and Form factor of different periodic waveforms, Steady state analysis of R, L and C (in series, parallel and series-parallel combinations) with sinusoidal excitation – Concept of Reactance, Impedance, Susceptance and Admittance – Phase and phase difference – Concept of Power factor, Real and Reactive powers – j-notation, Complex and polar forms of representation, Complex power – Locus diagrams. Series R-L, R-C, R-L-C and parallel combinations with variation of various parameters – Resonance – Series, Parallel Circuits, Concept of Bandwidth and Q-factor.

UNIT - III:

Three phase circuits: Phase sequence – Star and Delta connection – Relation between line and phase voltages and currents in Balanced systems – Analysis of balanced and Unbalanced 3 phase circuits – Measurement of 3 phase power, active power and reactive power.
Network topology : Definitions – Graph – Tree, Basic Cutset and Basic Tieset matrices for planar network – Loop and nodal methods of analysis of networks with dependent and independent voltage and current sources. Duality and Dual networks.

UNIT - IV:

Network theorems (without proof): Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Millman's and Compensation theorems for dc and ac excitations.

UNIT - V:

Transient response of RL, RC and RLC circuits (series and parallel combinations) for dc and Sinusoidal excitations – Initial conditions – Classical method and Laplace transform Methods of solutions – Response of RL, RC, RLC for step, ramp, pulse and impulse excitations using Laplace Transform Methods.

UNIT - VI:

Two port network parameters – Z, Y, (ABCD) Transmission and Hybrid Parameters for Resistive Networks – concept of Transformed Network – 2-port network parameters using transformed variables.

Filters – Low pass, High pass and Band pass filters – Constant-k and m-derived filters and composite filter design.

TEXT BOOKS:

- Engineering Circuit Analysis – by William Hayt and Jack E. Kemmerly, McGraw Hill, 5/e.
- Electric Circuits – by J. Edminister and M. Nahvi, - Schaum's outlines, TMH, 1999.
- Network Theory – by N. Srinivasulu, Hi-Tech Pub.

REFERENCES:

- Network theory – Sudhakar and Shymmohan , TMH publications.
- Network Analysis: - C.K. Mital, Khanna Publishers.
- Network Theory: - N.C. Jagan & C.Lakshminarayana, B.S Publications .

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I.B.TECH.

3 - 0 - 6 CSS1027

CSS1027 ELECTRONIC DEVICES & CIRCUITS(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, CSIT, CSSE,
ETM, ECM, BME)**UNIT - I: ELECTRON DYNAMICS AND CRO**

Motion of charged particles in electric and magnetic fields.
Motion of charged particles in electric and magnetic fields only.
Simple problems involving electric and magnetic fields only.
Electrostatic and magnetic focusing. Principles of CRT,
deflection sensitivity (Electrostatic and magnetic deflection).
Applications of CRO: Voltage, Current and Frequency
Measurements.

UNIT - II: SEMICONDUCTOR DIODES AND RECTIFIERS

Construction, Principle of operation, V-I characteristics, symbol,
equivalent circuit, parameter calculation, limitations and
specifications of - pn junction diode, Zener diode, Varactor
diode, Tunnel diode and photo diode. Diffusion and transition
diode, Hall Effect. Diode
capacitances of pn junction diode. Applications : Rectifiers – Half wave, Full wave and Bridge
Rectifiers, Filters – L, C, L-Section and π -section filters.

UNIT - III: TRANSISTOR CHARACTERISTICS

Construction, principle of operation, V-I characteristics, symbol,
equivalent circuit, parameter calculations, applications,
limitations and specifications of – BJT, FET, UJT and MOSFETs
(different configurations of transistors are to be considered).
SCR, DIAC, TRIACs. Optoelectronic devices.

UNIT - IV: AMPLIFIERS

Biasing, DC equivalent model, criteria for fixing operating point
and methods of Bias stabilization, Thermal run away and thermal
stability. Small signal low frequency transistor amplifier circuits:
h-parameter representation of a transistor, Analysis of single
stage transistor amplifier using h-parameters: voltage gain,
current gain, Input impedance and Output impedance
Comparison of BJT and FET. RC coupled amplifier – frequency
response. Biasing of FET, MOSFET. FET amplifier – frequency
response, FET Small signal model.

UNIT - V: FEEDBACK AMPLIFIERS

Concepts of feedback. Classification of feedback amplifiers,
General characteristics of negative feedback amplifiers, Effect of
Feedback on Amplifier characteristics, Simple problems.

UNIT - VI: OSCILLATORS

Condition for oscillations. RC and LC type oscillators, Crystal
oscillators, Frequency and amplitude stability of oscillators,
Generalized analysis of LC oscillators, Quartz (Hartley, Colpitts),
RC-phase shift and Wien-bridge oscillators.

TEXT BOOKS:

1. Electronic Devices and Circuits – by Millman and Halkias, Tata McGraw Hill.
2. Electronic Devices and Circuits – by R.L. Boylestad and Louis Nashelsky, Pearson Ed. Asia, PHI.
3. Electronic Devices and Circuits – by K. Lal Kishore, B.S. Publ.

REFERENCES:

1. Microelectronics – by Millman and Grabel, Tata McGraw Hill.
2. Electronic Devices and Circuits – by Bogart, Universal Bookstall, New Delhi.

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I B.TECH.

0 - 3 - 4

CSS1028

ENGINEERING DRAWING PRACTICE

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, CSIT, CSSE,
ETM, ECM, BME)

UNIT - I:

Introduction to Engineering Graphics – Construction of Ellipse,
Parabola and Hyperbola. Cycloidal Curves.

UNIT - II:

Orthographic Projections of Points, Lines and Planes – Axis
inclined to one plane and inclined to both the planes.

UNIT - III:

Orthographic Projections of Solids: Cylinder, Cone, Prism,
Pyramid and Sphere in simple positions and Axis inclined to both
the Planes.

UNIT - IV:

Development of Surfaces: Prisms, Cylinder, Pyramid and Cone.

UNIT - V:

Isometric Projections of Lines, Planes and Simple Solids.

UNIT - VI:

Conversion of Orthographic Views into Isometric Views and
Vice-Versa.

TEXT BOOKS:

- Engineering Graphics – by K.L. Narayana & P. Kannayya,
SciTech Publishers.
- Engineering Drawing – by N.D. Bhatt, Charotar Publishers.
- Engineering Drawing and Graphics – by Venugopal, New
Age International Limited.

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I B.Tech.

0 - 6 - 8

CSS1029

COMPUTER PROGRAMMING LAB

(Common for EEE, ECE, EIE, EContE, ICE, CSE, IT, CSSE,
ETM, ECM, BME)

- Write a C program that evaluates the following algebraic
expressions after reading necessary values from the
user:
 - $ax+b/ax-b$
 - $2.5 \log x + \cos 32^\circ + |x^2 - y^2| + \sqrt{2xy}$
 - $1/\sigma\sqrt{2n} e^{- (x-m)/\sqrt{2}\sigma^2}$
- Write a C program for the following
 - Printing three given integers in ascending order
 - Sum of $1 + 2 + 3 + \dots + n$
 - $1 + x^2/2! + x^4/4! + \dots$ upto ten terms
 - $x + x^3/3! + x^5/5! + \dots$ upto 7th digit accuracy
 - Read x and compute Y = 1 for $x > 0$, Y = 0 for $x = 0$,
 $Y = -1$ for $x < 0$
- Write C program using FOR statement to find the
following from a given set of 20 integers.
 - Total number of even integers.
 - Total number of odd integers.
 - Sum of all even integers.
 - Sum of all odd integers.
- Write a C program to obtain the product of two matrices
A of size (3x3) and B of size (3x2). The resultant
matrix C is to be printed out along with A and B.
Assume suitable values for A & B.
- Using switch-case statement, write a C program that
takes two operands and one operator from the user,

performs the operation and then prints the answer.
(Consider operators +, -, /, * and %).

6. Write C procedures to add, subtract, multiply and divide two complex numbers ($x+iy$) and ($a+ib$). Also write the main program that uses these procedures.
 7. The total distance traveled by vehicle in 't' seconds is given by distance = $ut + \frac{1}{2}at^2$ where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec²). Write C program to find the distance traveled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.
 8. A cloth show room has announced the following seasonal discounts on purchase of items.
- | Purchase Amount | Discount (Percentage) | |
|-----------------|-----------------------|----------------|
| | Mill Cloth | Handloom items |
| 1-100 | - | 5.0 |
| 101-200 | 5.0 | 7.5 |
| 201-300 | 7.5 | 10.0 |
| Above 300 | 10.0 | 15.0 |
- Write a C program using switch and If statements to complete the net amount to be paid by a customer.
9. Given a number, write C program using while loop to reverse the digits of the number. Example 1234 to be written as 4321.
 10. The Fibonacci sequence of numbers is 1,1,2,3,5,8... based on the recurrence relation $f(n) = f(n-1) + f(n-2)$ for $n > 2$. Write C program using do-while to calculate and print the first m fibonacci numbers.

11. Write C programs to print the following outputs using for loop.

1	1				
2	2	2			
3	3	3	3		
4	4	4	4	4	
5	5	5	5	5	5

12. Write a C program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted starting with the nth character.
13. A Maruthi Car dealer maintains a record of sales of various vehicles in the following form:

Vehicle type	Month of sales	Price (Rs)
Maruthi – 800	02 / 87	75,000
Maruthi – DX	07 / 87	95,000
Gypsy	04 / 88	1,10,000
Maruthi Van	08 / 88	85,000

Write a C program to read this data into a table of strings and output the details of a particular vehicle sold during a specified period. The program should request the user to input the vehicle type and the period (Starting month & ending month).

14. Write a function that will scan a character string passed as an argument and convert all lower case characters into their upper case equivalents.
15. Implement the following data structures using Arrays (i) Stacks (ii) Linear Queues (iii) Circular queues (iv) Dequeue.
16. Implement polynomial addition and multiplication with linked list sparse matrix.
17. Implement binary search tree using linked list and perform the following operations. (i) Insertion (ii) Deletion (iii) Inorder Traversal (iv) Preorder Traversal (v) Post Order Traversal.

18. Singly linked list and doubly linked lists (i) Insertion (ii) Deletion (iii) Lookup
19. (i) Implement stack using singly linked list. (ii) Implement queue using singly linked list.
20. Implement the following sorting techniques (i) Bubble sort (ii) Insertion Sort (iii) Quick Sort (iv) Heap Sort.
21. Implement the following searching method. (i) Sequential Search (ii) Binary Search (iii) Fibonacci
22. (i) Conversion of Infix expression to Postfix notation. (ii) Simple expression evaluator, that can handle +,-,/ and *
23. Implement the algorithms for the following iterative methods using C to find one root of the equation $f(x)=x$
 $\sin x + \cos x = 0$.
 a) Bisection (b) False Position (c) Newton-Raphson
 d) Successive approximation.
24. Write programs for implementing Gauss-Jordan and Gauss-Seidal methods for solving simultaneous algebraic equations given below.
- $$9x_1+2x_2+4x_3 = 20$$
- $$x_1+10x_2+4x_3 = 6$$
- $$2x_1-4x_2+10x_3 = -15.$$
25. Write Computer programs to implement the Lagrange interpolation and Newton-Gregory forward interpolation.
26. Implement in 'C' the linear regression and polynomial regression algorithms.
27. Implement Trapezoidal and Simpson methods.
28. Practice of exercises (in text book 2 of theory) related to:
 a) Word 2000 Chapter 7, 8, 9. (b) Excel 2000 Chapter 12, 13. (c) Power point- 2000 Chapter 15, 16. (d) Access 2000 Chapter 18,19. (e) Outlook 2000 Chapter 21,22,23. (g) FrontPage 2000 Chapter 25

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I.B.TECH.

0 - 3 - 4

CSS1030

ELECTRONIC DEVICES & CIRCUITS LAB

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, CSIT, CSSE, ETM, ECM, BME)

1. PN Junction diode characteristics
 A. Forward bias B. Reverse bias.
2. Zener diode characteristics
3. Transistor CB characteristics (Input and Output)
4. Transistor CE characteristics (Input and Output)
5. Transistor CC characteristics (Input and Output)
6. Rectifier without filters (Full wave & Half wave)
7. Rectifier with filters (Full wave & Half wave)
8. FET characteristics
9. UJT characteristics
10. Study of CRO
11. Measurement of h parameters of transistor in CB, CE, CC configurations
12. CE amplifier
13. CC amplifier (emitter follower)
14. Single stage R-C coupled Amplifier.
15. FET amplifier (Common Source)
16. FET amplifier (Common Drain)
17. Wien Bridge Oscillator
18. RC Phase Shift Oscillator
19. Feed back amplifier (Current Series).
20. Feed back amplifier (Voltage Series).
21. Colpitts Oscillator
22. Hartley Oscillator
23. SCR characteristics.

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II B.TECH. I-Semester

4 - 0 - 4

CSS2121

MATHEMATICS - II

(Common for all Branches)

UNIT - I

Matrices – brief review – Inverse of a matrix by adjoint , elementary row transformations – Rank - Normal form – echelon form. Augmented matrix – Consistency – Solution of system of simultaneous linear homogeneous and non-homogeneous equations.

UNIT - II

Eigen values, eigen vectors – properties – Cayley-Hamilton Theorem (Inverse and powers of a matrix by Cayley-Hamilton theorem). Quadratic forms – positive, negative definite – Diagnolization of matrix. Calculation of powers of matrix – Modal and spectral matrices. Real matrices – Symmetric, skew-symmetric, orthogonal. Linear Transformation – Orthogonal Transformation. Quadratic forms – Reduction of quadratic form to canonical form – index – signature. Complex matrices : Hermitian, Skew-Hermitian and Unitary – Eigen values and eigen vectors of complex matrices and their properties.

UNIT - III: Fourier Series

Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

UNIT - IV :

Formation of Partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations. Method of separation of variables – Classification of second order linear Partial Differential Equations, solutions of one dimensional heat equation, wave equation and two-

dimensional Laplace's equation under initial and boundary conditions.

UNIT - V

Fourier integral theorem – Fourier sine and cosine integrals. Fourier transform – Fourier sine and cosine transforms – properties – Inverse transforms – Finite Fourier transforms. Solution of one dimensional wave, heat equations and two dimensional Laplace's equation by Fourier transforms.

z-transform – Inverse z-transform – properties – Damping rule – shifting rule – Initial and final value theorems.

Convolution theorem – Solution of difference equations by z-transforms.

TEXT BOOKS :

1. A Text Book of Engineering Mathematics Volume – II - 2002 T.K.V. Iyengar, B. Krishna Gandhi and others, S. Chand and Company
2. Engineering Mathematics B.V. Ramana, Tata McGraw-Hill -2002
3. Engineering Mathematics – II - 2002 C. Sankaraiah, Vijaya Publications
4. Engineering Mathematics – II - 2002 P. Nageswara Rao, Y. Narsimhulu, Prabhakar Rao

REFERENCES :

1. Engineering Mathematics S.K.V.S. Sri Rama Chary, N. Bhujanga Rao, P. Bhaskara Rao, B.S. Publications 2000 Advanced Engineering Mathematics (Eighth edition) Erwin Kreyszig, John Wiley & Sons (ASIA) Pvt. Ltd. – 2001
2. Advanced Engineering Mathematics (Second edition) Michael D. Green Berg, Prentice Hall, Upper saddle River, New Jersey-1998
3. Sarveswara Rao Koneru Engineering Mathematics Orient Longman (Pvt.) Ltd. 2002
4. Engineering Mathematics - II N.P. Bali, Laxmi Publications (P) Ltd., New Delhi.

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II B.TECH. I-Semester 4 - 0 - 4 CSS2122

DISCRETE STRUCTURES AND GRAPH THEORY

UNIT-I

Mathematical Logic:
Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, predicates, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theory Proving.

UNIT II

Set Theory

Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram, Functions, Inverse functions, Composition of functions, Recursive functions, Lattice and its properties.

UNIT III

Graph Theory I:

(Elementary treatment only) Definition, Representation, path Matrix Warshalls.
Algorithm, MINIMA Algorithm, Isomorphism, sub graphs, connected components, cyclic graph, Bipartite graph, Planar graph, Euler's formula, Euler circuit, De Bruijn sequence, Hamiltonian Graph, Chromatic number, cutset, tie etc.

UNIT IV

Graph Theory II:

Trees, Spanning tree of a Graph, Breadth – First & Depth – First Spanning trees, Binary Tree, Conversion of a tree, to binary tree. Tree traversals, Representation of Expressions by Binary tree, Forest, Binary search trees.

UNIT V:

Combinatorics & Recurrence Relations:

Disjunctive & Sequential counting, Combinations & Permutations, Enumeration without repetition Recurrence relation, Fibonacci relation, solving recurrence relation by substitution, solving non-linear recurrence relation by conversion to linear recurrence relation.

TEXT BOOKS:

1. Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar .P
2. Discrete Maths for Computer Scientists & Mathematicians (Chapter 2,5,7) Prentice Hall, 1986 J.L. Mott, A. Kandel, T.P. Baker.

REFERENCE:

7. Discrete Mathematical Structures, Kolman, Busby, Ross, Pearson Education IV edition.

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II B.TECH. I-Semester 4 – 0 – 4 CSS2123

LINEAR & DIGITAL IC APPLICATIONS
(Common for ECE, EIE, E.Cont.E, Mechatronics, CSE &
CSIT)

UNIT -I

OPERATIONAL AMPLIFIERS:

Design aspects of Monolithic Opamps, ideal characteristics, specifications offset voltages & currents, frequency compensation techniques, measurements of opamps parameters, application of Opamps, inverting, non-inverting amplifiers, integrators, function generators, logarithmic amplifiers, instrumentation amplifiers, signal conditioning circuits, multivibrators, square wave generator, rectifiers, peak detectors and voltage regulators.

UNIT - II

555 Timer, 556 function generator, IC's & their applications, terminal regulators IC 1496 (Balance modulator) IC565 phase locked loops & their typical applications, IC1496 (Balanced modulator) applications.

UNIT-III

ACTIVE FILTERS:

LPF, HPF, BPF, BEF, ALL Pass filters, and higher order filters and design, VCSV and IGMF configurations.

UNIT-IV

LOGIC FAMILIES:

DTL,TTL,ECL,IIL,MOS Logic families, parameters and their comparison, true state logic, interfacing of Logic Families, Flip-Flops.

UNIT-V:

Analog multiplexers, sample and hold circuits, D/A converters – resistive divider and ladder Networks, A/D converters, counters – ramp type, dual slope, integration technique, successive approximation, parallel comparison technique.

REFERENCE BOOKS:

1. Micro Electronics – Jacob Millman (ISE)
8. Opamps & Linear integrated circuits – Ramakanth Gayakwad (PHI)
9. Integrated Circuits – Borkar (Khanna)
4. Applications of linear integrated circuits – Clayton.

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II B.TECH. I-Semester 4 – 0 – 4 CSS2124

SWITCHING THEORY & LOGIC DESIGN

UNIT - I:

NUMBER SYSTEMS & CODES:

Review of number systems – binary arithmetic – binary weighted and non-weighted codes – error detecting and error correcting codes.

BOOLEAN ALGEBRA:

Postulates and theorems; representation of switching functions – SOP & POS forms – Karnaugh Map representation – Minimisation using K-maps.

UNIT - II: DESIGN OF COMBINATIONAL CIRCUITS:

Tabular minimization – design of single output and multi output functions – design using conventional AND, OR, NOT, NAND, NOR & EX – OR gates. Design using MSI & LSI devices – Digital multiplexer / selector decoder, demultiplexer – design of 4 bit adder, carry look – ahead adder, magnitude comparator – BCD converter, logic implementations using ROM, PAL & PLA.

UNIT - III: INTRODUCTION TO SEQUENTIAL CIRCUITS:

Combinational versus sequential circuits, Asynchronous versus synchronous circuits - State table and state diagram – state assignment – Memory elements and their excitation functions – T flip flop, D flip flop, RS flip flop, JK flip-flops and their excitation requirements – Design of synchronous sequential circuits like Sequence Detectors and binary counters.

UNIT - IV: CAPABILITIES & MINIMIZATION OF SEQUENTIAL MACHINES:

Melay and Moore machines – capabilities and limitations of finite state machine - state equivalence and machine minimization.

UNIT - V: ALGORITHMIC STATE MACHINES:

ASM chart, Timing considerations, control implementation, Design with multiplexers and PLA control. Introduction to unate functions and threshold logic.

TEXT BOOKS:

1. Switching finite automata Theory – by Zvi Kohavi, TMH edition.
2. Digital Logic and Computer Design – by Mano, M.Morris.
3. Digital Logic Design Principles – by Normal Balbamian, Bredly John Wiely.

REFERENCES:

1. Introduction to switching theory and logic design – by F.J.Hill and Peterson, John Wiley Publications.
2. Digital logic - Applications & Design – by John M. Yarbrough, Vikas Publications, 1997.
3. Digital Systems Design – by R.P. Jain.
4. Digital Systems : Principles and Applications – Ronald J. Tocci, Pearson Education.

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II B.TECH. I-Semester

4 - 0 - 4

CSS2125

DESIGN AND ANALYSIS OF ALGORITHMS

UNIT-I

INTRODUCTION:
Algorithm analysis, Time complexity and space complexity, O notation Omega notation and Theta notation.

DIVIDE AND CONQUER:

General Method, merge sort, quick sort, strassen's matrix multiplication.

GREEDY METHOD:

General method, optimal storage on tapes, knapsack problem, minimum spanning tree.

UNIT-II

SET MANIPULATION ALGORITHMS:
Fundamental operation of sets, algorithm for UNION and FIND, introduction to optimal binary search tree, balanced tree schemes, 2-3 tree, AVL tree, dictionary, priority queue, mergeable heap, heap for priority queue.

UNIT-III

DYNAMIC PROGRAMMING:

Multistage graphs, optimal binary search trees, 0/1 knapsack problem, reliability design problem, travelling sales person problem.

UNIT-IV

SEARCH AND TRAVERSAL TECHNIQUES:

Efficient non-recursive binary tree traversal algorithms, tree traversal, breadth first search and traversal, depth first search and traversal, AND/OR graphs, game tree.

BACK TRACKING: General method, 8-queen problem, graph coloring problem.

UNIT-V:

BRANCH AND BOUND:

LC search, bounding, LC branch and bound, FIFO branch and bound.

ALGEBRAIC SIMPLIFICATION AND TRANSFORMATIONS:

General Method, Evaluation and interpolation, modular arithmetic.

TEXT BOOKS:

1. "Fundamentals of Algorithms", E. HOROWITZ and S. SAHNI, GALGOTIA.
2. "Design and Analysis of Algorithms" E. HOROWITZ and S. SAHNI Edition 1984.

REFERENCE BOOKS:

1. Algorithm Design , Micheal P Goordicoh , Roberto Tamassia, John Wiel

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II B.TECH. I-Semester

4 - 0 - 4

CSS2126

OBJECT ORIENTED PROGRAMMING. (THROUGH JAVA.)

UNIT I:

Introduction to object oriented programming concepts- java as an object oriented programming language – introduction to java applications and applets-control structures-methods-arrays. (chapters 1-7)

UNIT II:

Object based and object oriented programming-creating packages –using overloaded constructors-static class variables-data abstraction and information hiding-relation between super class objects and subclass objects-composition verses inheritance-polymorphism –dynamic method binding-abstract super classes and concrete super classes-inheriting interface-super classes and concrete super classes- StringTokenizer and StringBuffer classes.(chapters 8,9,10)

UNIT III:

Role of object oriented programming in designing GUI- Graphics and Java2D- overview of swing- event handling, adapter classes and layout managers. Advance GUI components-JPopupMenu-and JDesktopPane-advance layout managers. (Chapters 11,12,13)

UNIT IV:

Exception handling and multithreading in object oriented programming-

When exception handling should be used-java exception handling-exceptions and inheritance- multithreading in java – thread synchronization-daemon threads- Runnable interface- Files and Streams in java. (Chapters 14,15,17)

UNIT V:

Network and Database handling through object oriented programming- using JDBC – processing queries- overview of servlets- multitier applications using JDBC from a Servlet-introduction to networking- establishing a simple server and a client- introduction to RMI - implementing the remote interface.(chapters 18,19,20,21)

TEXT BOOK:

1. Java How To Program, H. M. Deitel and P. J. Deitel, Prentice Hall 3rd edition.
2. "An Introduction to Programming and object oriented Design using Java" by Jaime Nino and Fedric A.Hosch, John Wiley.

REFERENCE BOOKS:

1. An introduction to Object Oriented Programming with Java II Edition, C. Thomas Wu, TMH.
2. The complete reference JAVA 2 IV Edition, Herbert Schildt, TMH.
3. Introduction to Java Programming, Daneal/Yong, PHI.
4. Beginning Java 2 , Ivon Horton ,Wrox Publishers .
5. Internet and Java Programming, R.Krishnamoorthy nsd S.Prabhu, New Age International.

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II B.TECH. I-Semester

0 - 3 - 2

CSS2127

IC APPLICATIONS LAB

(Common for ECE,EIE,E.Cont.E, Mechatronics)
(Minimum 10 experiments should be conducted)

1. Integrator and Differentiator using 741 OPAMP.
2. A) Astable using 555
B) Monostable using 555
3. Function generator using 741 OPAMP.
4. Voltage regulator using what?
5. Inverter transfer characteristics and study of logic gates.
6. Study of flip flops using lcs.
7. 7490 counters.
8. Half adder, full adder and subtractor
9. BCD to 7 segment decoder using 7447
10. Three terminal regulator 7805,7809,7912,565,PLL,566
VCO
11. D/A Converter
12. A/D Converter
13. Study of PLAS.

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II B.TECH. I-Semester

0 - 3 - 2

CSS2128

OOPS LAB THROUGH JAVA

Note: The student is advised to refer the prescribed textbook for detailed description of the exercises and hints.

1. Write a java application that reads in two integers and determines and prints if the first is a multiple of the second. (Ex 2.28 pp 74)
2. Write an applet that inputs from the user the radius of a circle as a floating point number and draws the circles diameter, circumference and area. (Ex 3.9 pp 110)
3. Write an applet that allows the user to input the four arguments required by method draw Oval, then draws an oval using the four input values. (Ex 3.18 pp 111)
4. Find two largest values of the 10 numbers entered. (Numbers are not repeated) (Ex 4.17 pp 152)
5. Write an application to find all Pythagorean triples for side1, side2, and hypotenuse all no larger than 500. (Ex 5.18 pp 198)
6. Write a method that determines if a number is prime. Use this method in an applet that determines and prints all the prime numbers between 1 and 10,000. (Ex 6.26 pp 263)
7. A company pays its sales people on a commission basis. The sales people receive \$200 per week plus 9% of their gross sales for that week. Write a program that determines how many of the sales people earn salaries in each of the following ranges: 200-299 , 300-399 ,400-499,----- 900-999, 1000 and over. (Ex 7.10 pp 306)
8. Create a class Rectangle. The class has attributes length and width each of which defaults to 1. It has methods that calculate the perimeter and the area of the rectangle. It has set and get methods for both length and width.(Ex 8.8 pp 381)

9. Develop a basic graphics package using Shape inheritance to draw rectangles, triangles circles as per user choice. (Ex 9.24 pp 452)
10. Write a pay roll system. (Ex 9.25 pp 452)
11. Write an application that inputs a line of text tokenizes the line with an object of class String Tokenizer and outputs the tokens in reverse order. (Ex 10.13 pp 507)
12. Write an application that simulates a screen saver. (Ex 11.20 pp 553)
13. Write a program that draws a rectangle when a mouse is dragged with appropriate width and length. (Ex 12.27 pp 623)
14. Build your own color system that can be used by other applets and applications. (Ex 13.13 pp 696)
15. Use inheritance to create an exception super class and various exception sub classes. Write a program to demonstrate that the catch specifying the super class catches sub class exceptions. (Ex 14.21 pp 732)
16. Write a java program to demonstrate that as a high priority thread executes, it will delay the execution of all lower priority threads. (Ex 15.19 pp 771)

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

II B.TECH. II-Semester

4 – 0 – 4

CSS2221

PROBABILITY AND STATISTICS

UNIT – I

PROBABILITY:

Sample space and events – probability - The axioms of probability – Some elementary theorems – conditional probability – Baye's theorem

UNIT – II

PROBABILITY DISTRIBUTIONS:

Random variables – Discrete and continuous – Distribution – Distribution function – Distributions – Binomial, poisson and normal distribution – related properties

UNIT – III

SAMPLING DISTRIBUTION:

Populations and samples – Sampling distributions of mean (known and unknown) Proportions, sums and differences.

UNIT – IV

INFERENCES CONCERNING MEANS AND PROPORTIONS:

Point estimation – Interval estimation – Bayesian estimation – Test of Hypothesis – Means and proportions – Hypothesis concerning one and two means-Type I and Type II errors. One tail, two-tail tests- Tests of significance, - Student t- test, F-tests, - χ^2 test. estimation of proportions .

UNIT – V

CURVE FITTING:

The method of least squares – inferences based on the least squares estimations – Curvilinear regression – multiple regression- Correlation for univariate and bivariate distributions.

TEXT BOOKS :

1. Probability and Statistics for Engineers by Irwin Miller and John E. Freund.
Prentice-Hall of India Private Limited, 6th edition.
2. Engineering Mathematics – B.V. Ramana, Tata McGraw-Hill -2002

REFERENCE BOOK :

1. Probability and Statistics for Engineers. By Walpole and Meyer.
2. Advanced Engineering Mathematics (Eighth edition)
Erwin Kreyszig, John Wiley

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD****II B.TECH. II-Semester****4 – 0 – 4****CSS2222****CS2222 ELECTRICAL TECHNOLOGY**

(Common for ECE, EIE, E.Cont.E, CSE, IT, BME)

UNIT-I: DC MACHINES

Principle of operation of DC Machines- EMF equation – Types of generators – Magnetization and load characteristics of DC generators – DC Motors – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Losses and efficiency – Swinburne's test – Speed control of DC shunt motor – Flux and Armature voltage control methods.

UNIT-II: TRANSFORMERS:

Principle of operation of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit – Losses and Efficiency and Regulation – OC and SC tests – Predetermination of efficiency and regulation.

UNIT-III: THREE PHASE INDUCTION MOTOR:

Principle of operation of three-phase induction motors – Constructional features – Slip ring and Squirrel cage motors – Slip-Torque characteristics – Efficiency calculation – Starting methods.

UNIT-IV:

Synchronous generators – Constructional features – types – EMF Equation – Distribution and Coil span factors – Predetermination of regulation by Synchronous Impedance Method – OC and SC tests.

Principle of operation of synchronous motor.

UNIT-V:

Single Phase Induction Motors – Constructional features – Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors – Characteristics.

TEXT BOOKS:

1. Electrical Technology – Edward Hughes, 7th Edition – Pearson Education / PHI.
2. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.

REFERENCES:

1. Electrical Engineering – Del Toro, 2nd Edition, Prentice Hall of India.
2. Electrical Machines – P.S Bhimbra, Khanna Publishers.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

II B.TECH. II-Semester

4 – 0 – 4

CSS2223

OPERATING SYSTEMS**UNIT-I**

Computer system and Operating System overview: Overview of Computer System hardware – instruction execution – I/O function – Interrupts – memory hierarchy – I/O communication techniques. Operating systems objectives and functions – Evaluation of operating systems – Example systems. Process description and control: Process states – process description – process control – Processes and Threads – Examples of process description and control.

UNIT II

Concurrency: Principles of concurrency – mutual exclusion – software and hardware approaches – semaphores – monitors – message passing – readers/writers problem. Principles of deadlock – deadlock prevention, detection and avoidance – dining philosophers problem – Example systems.

UNIT III

Memory Management: Memory management requirements – loading programs into main memory – virtual memory – hardware and control structures – OS software – Examples of memory management.

UNIT IV

Uniprocessor scheduling: types of Scheduling – Scheduling algorithms – I/O management and disk scheduling – I/O devices – Organization of I/O function – OS design issues – I/O buffering – Disk I/O – disk scheduling policies – examples system.

UNIT V

File management and security: Overview of file management – file organization and access – File directories – File sharing – Record blocking – secondary storage management – example system. Security: Security Threats – Protection – Intruders – Viruses – Trusted Systems.

TEXT BOOKS:

William Stallings – "Operating Systems" – PHI – Second Edition 1997.

REFERENCE BOOKS:

Charles Crowing – Operating System TMH 1998.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

II B.TECH. II-Semester

4 – 0 – 4

CSS2224

COMPUTER ORGANIZATION**UNIT I**

Concept of Von Newmann Machine, components in a computer, functions of various of components, bus structure, arithmetic logic unit, computer arithmetic: addition/subtraction of integers, multiplication and division of integers; floating point arithmetic operations, BCD arithmetic operations.

UNIT II

Concept of instruction format and instruction set of a computer, types of operands and operations; addressing modes; processor organization, register organization and stack organization; instruction cycle; basic details of Pentium processor and power PC processor, RISC and CISC instruction set.

UNIT III

Memory devices: Semiconductor and ferrite core memory, main memory, cache memory, associative memory organization; concept of virtual memory; memory organization and mapping; partitioning, demand paging, segmentation; magnetic disk organization, introduction to magnetic tape and CDROM.

UNIT IV

I/O Devices: Programmed I/O, interrupt driver I/O, DMA, I/O modules, I/O addressing; I/O channel, I/O Processor, Dot matrix printer, ink jet printer, laser printer.

UNIT V

Advanced concepts: Horizontal and vertical instruction format; microprogramming, microinstruction sequencing and control; instruction pipeline; parallel processing; problems in parallel processing; data hazard, control hazard.

Text Books:

1. Computer organization and architecture", Williams Stallings, PHI of India, 1998.
2. Computer organization, Carl Hamachar, Zvonko Vranesic and Safwat Zaky, McGraw Hill International Edition.
3. Computer Architecture & Organization, John P. Hayes, TMH III Edition.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD****II B.TECH. II-Semester****4 – 0 – 4****CSS2225****MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS****UNIT I:****Introduction to managerial Economics**

Managerial Economics: Definition, nature and scope – Demand analysis: Law of Demand, demand determinants, Elasticity of Demand: Definition, types, measurement and significance-Demand Forecasting methods.

UNIT II**Theory of Production**

Firm and industry – Production Function – Cobb Douglas Production Function – Laws of returns – Internal and External economies of scale.

Cost Analysis: Cost concepts, fixed vs variable costs, explicit vs implicit costs, out-of-pocket costs vs imputed costs, opportunity cost, sunk costs and abandonment costs.

Break-even analysis: Concept of Break-Even point (BEP) – Break Even Chart – Determination of BEP in volume and value – Assumptions underlying and practical significance of BEP. (Simple Problems).

UNIT III:**Introduction to Markets and Business Organizations**

Market Structures – Types of competition – Features of Perfect Competition, Monopoly, Monopolistic Competition – Price-output determination.

Types of Business Organization – Features, merits and demerits of Sole proprietorship, Partnership and Joint stock companies – types of companies – Public Enterprises – Types of features.

UNIT IV:

Introduction to Capital:
Capital and its significance – types of capital – Estimation of Fixed and working capital requirements – Methods of raising capital.

Introduction to capital budgeting methods: Pay back method, Accounting Rate of Return (ARR) and Net Present Value (NPV) method. (Simple Problems).

UNIT V:

Introduction to Financial Accounting and Financial analysis:
Double Entry Book Keeping – Journal – Ledger – Trial Balance – Trading Account, Profit and Loss Account and Balance Sheet with Simple adjustments.

Ratio Analysis:

Computation of liquidity ratios (current ratio and quick ratio), activity ratios (inventory turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt-equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS). Analysis and Interpretation.

Books for Reference:

1. Managerial Economics, Joel Dean, PHI, 2001.
2. Financial Management Policy 12th Edition, James C. Van Horne, PHI.
3. Managerial Economics, Varshini & Maheswari, S. Chand & Co., 2000
4. Fundamentals of Business Organization and ManagementY. K. Bhushan, Sultan Chand, New Delhi.
5. Financial Accounting, Narayana Swamy, PHI 2001.
6. Managerial Economics and Financial Analysis (MEFA) for JNTU (B.Tech), TMH, New Delhi.
7. Readings in Accounting and Finance, R. K. Mishra et al.
8. R.L. Gupta, Financial Accounting, Volume I, Sultan Chand New Delhi, 2002

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

II B.TECH. II-Semester **4 – 0 – 4**

CSS2226

DATABASE MANAGEMENT SYSTEMS**UNIT I**

Introduction to database systems: Overview- File systems Vrs DBMS., Various data models – Levels of abstraction – Structures of DBMS – Relational Model – Relations and Integrity Constraints – Relational Algebra and Calculus – SQL – Basic SQL Query – Nested Queries – Aggregate operators – Embedded SQL – Dynamic SQL – Security, views, SQL-QBE.

UNIT II

File Organization: Storage media – Buffer management – Record and page formats – File Organizations – various kinds of indexes and external sorting.

UNIT III

Query optimization and evaluation: Introduction to Query Processing Selection operation – Projection operation – join operation – set operation and Aggregate operation – Relational Query Optimization – Translating SQL queries – mho algebra – Estimating the cost – Relational Algebra Equivalences.

UNIT IV

Database Design: Overview of data base design – ER model – features of ER model – Conceptual design using ER model, scheme refinement and Normal Forms – Schema Refinement – Use of decompositions – functional Dependencies – Normal forms, multi valued Dependencies.

UNIT V

Concurrency control and recovery: concepts of transaction – Transactions and schedules – Lock based concurrency control –

2002-2003

Lock management – specialized locking techniques –
Concurrency control without locking – crash recovery –
Introduction to crash recovery – Log recovery – check pointing –
media recovery.

TEXT BOOKS:

1. Database System Concepts, Silberschatz, Korth, Mc Graw Hill, IV edition.
2. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, Mc Graw Hill, II edition.

REFERENCE BOOKS:

1. Database Management and Design, G. W. Hansen and J. V. Hansen, PHI, 1999.
2. Database Management Systems, Alexis Leon, Mathews Leon, Leon Vikas.

2002-2003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II B.TECH. II-Semester

0 – 3 – 2

CSS2227

DATABASE MANAGEMENT SYSTEMS LAB

1. Creating tables for various relations (in SQL)
2. Implementing the queries in SQL for
 - a) Insertion
 - b) Retrieval (Implement all the operation like Union, Intersect, Minus, in, exist, aggregate functions (Min.,Max...) etc...)
 - c) Updation
 - d) Deletion
3. Creating Views
4. Writing Assertions
5. Writing Triggers
6. Implementing Operations on relations (tables) using PL/SQL
7. Creating FORMS
8. Generating REPORTS.

OPERATING SYSTEMS LAB

1. Simulate the following CPU scheduling algorithms
 - (a) Round Robin (b) SJF (c) FCFS (d) Priority
2. Simulate all file allocation strategies
 - (a) Sequential (b) Indexed (c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
 - (a) Single level directory (b) Two level (c) Hierarchical (d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
 - a) FIFO b) LRU c) LFU Etc...
8. Simulate Paging Technique of memory management.

PRINCIPLES OF PROGRAMMING LANGUAGES

UNIT-I

Preliminary Concepts: Significance of programming language study. Issues in Design – Programming domains, Evolution & good design criteria. Implementation – Translation and Virtual machines and programming Imperative, OOP, Functional programming, programming paradigms.

Syntax and Semantics: General problem of describing syntax and semantics – BNF, FSA, PDA, Attribute grammar, derivation semantics, NL overview, Program verification, Algebraic Data types.

UNIT-II

Data types and Variables: Primitives and non primitives data types. Variables, type checking, type compatibility, strong types, type conversion and scope and extent of variables.

Expressions: Arithmetic, Relational and Boolean expression, short circuit evaluation, assignment statements, mixed mode assignment, (referential transparency and functional programming)

UNIT-III

Control Structures: Statement level control structures, compound statements, selection, iterative, unconditional statements and general commands.

Subprograms: Fundamentals of subprograms, design issues of subprogram, parameter passing method, passing subprogram as parameters, overloaded subprograms and operations, generic subprograms, separately compiled modules, co routines.

UNIT-IV

Abstract Data types: Abstraction and encapsulation, Introduction to data Abstraction, design issues, language examples, C++ parameterized abstract data types.

Concurrency: Subprogram level concurrences, semaphores, monitors, message passing, concurrency in Ada, Java threads.

UNIT-V:

Exception Handling: Variables on subprogram control, exceptions and exception handling. Exception handles in C++ and Java

Functional Programming Languages:

Introduction, Mathematical Functions, Fundamentals of Functional Programming Languages, LISP, ML, Haskell, Applications of Functional Languages, A Comparison of Functional and Imperative Languages,

Logic Programming Languages:

Introduction, An Overview of Logic Programming, The Basic Elements of Prolog, applications of Logic Programming.

TEXT BOOKS:

1. Concepts of Programming Languages 4th Edition, Robert W.Sebesta (Addison Wesley)
2. Programming Languages – Design and Implementation 4th Edition, Terrence W.Pratt & Marvin, V.Zelkowitz (PHI)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. I-Semester

4 – 0 – 4

CSS3122

INTERFACING THROUGH MICROPROCESSORS

UNIT-I

8086 ARCHITECTURE:

Functional Diagram, register organization, addressing modes instructions, pc hardware, functional schematic, various terminology.

UNIT-II

A L PROGRAMMING OF 8086:

Simple programs, programs using the assembler, implementation of FOR loop, WHILE, REPEAT and IF-THEN-ELSE features, string manipulation procedures, macros.

UNIT-III

INTERFACING I:

8086 systems bus structures memory and I/O interfacing with 8086, interfacing through various IC peripheral chips like 8255, 8257, 8259.

UNIT IV:

Interfacing II:

Interfacing of switches, keyboards, LED's, 7-segment display units, transducers, actuators, stepper motor, A/D and D/A, CRT interface, floppy interface.

UNIT-V

INTERFACING III:

Serial communication standards, USART interfacing RS-232, IEEE-488, 20mA current loop, prototyping and trouble shooting, software debugging tools, MDS.

BOOKS:

1. D. V. HALL: Microprocessors and Interfacing.
2. GIBBSON: Microprocessor Software and Hardware.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III B.TECH. I-Semester

4 – 0 – 4

CSS3123

THEORY OF COMPUTATION

UNIT I:

Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, non deterministic finite automaton, deterministic finite automaton, equivalence between NFA and DFA, Conversion of NFA into DFA, minimisation of FSM, equivalence between two FSM's, Moore and Mealy machines.

UNIT II:

Regular sets, regular expressions, identity rules, manipulation of regular expressions, equivalence between RE and FA, inter conversion, pumping lemma, closure properties of regular sets (proofs not required), regular grammars, right linear and left linear grammars equivalence between regular linear grammar and FA, inter conversion, enumeration of properties of CFL (proofs omitted).

UNIT III:

Context free grammar, derivation trees, Chomsky normal form, Greibach normal form, push down automata, definition, model, acceptance of CFL, equivalence of CFL and PDA, interconversion, enumeration of properties of CFL (proofs omitted).

UNIT IV

Turing Machine, definition, model, acceptance of CFL, equivalence of CFL and PDA, inter conversion, enumeration of properties of CFL (Proofs omitted).

UNIT V:

Chomsky hierarchy of languages, linear bounded automata and context sensitive language, Introduction to DCFL and DPDA, LR(0) grammar, decidability of problems, Universal Turing Machine, undecidability of Posts Correspondence problem,

turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

TEXT BOOK:

1. Hopcroft H.E. and Ullman J. D. "Introduction to Automata Theory Languages and Computation".
2. Lewis H.P. & Papadimitriou C.H. "Elements of Theory of Computation", Prentice Hall.

REFERENCE BOOKS :

1. Introduction to languages and the Theory of Computation ,John C Martin, Mc Grawhill
2. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

III B.TECH. I-Semester

4 – 0 – 4 CSS3124

SYSTEMS PROGRAMMING

UNIT I:

INTRODUCTION TO PC ARCHITECTURE (Intel Pentium, PC Hardware, segments and addressing, Registers, ASSEMBLY LANGUAGE BASICS Machine Addressing, special DEBUG features, Data Definition Directives, Addressing Formats, COM Programs.

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UNIT II:

PROGRAM LOGIC AND CONTROL: JMP, LOOP and conditional jump Instructions, Boolean operations, Shifting, Rotating, KEYBOARD AND SCREEN PROCESSING, String Operations, Arithmetic Operations and Table Processing, Searching, sorting.

UNIT III:

MACRO WORKING AND LINKING: Macro Definition, The LOCAL Directive, reception Directives, conditional Directives, Intra-segment and Inter-segment calls, passing parameters, ADVANCED SCREEN AND KEYBOARD PROCESSING, BIOS Interrupt 16H for Keyboard input, Extended Function Keys.

UNIT IV:

DISK PROCESSING: Disk Organization, File allocation Table, File Control Block, Sequential Reading of a Disk File, Random Processing, Miscellaneous disk Processing Features, File Handlers and Extended DOS functions, BIOS Disk Operations, DOS MEMORY MANAGEMENT Program Segment Prefix, DOS Memory Control, Program loader, program overlays, Resident programs.

UNIT V

ASSEMBLERS AND MACROPROCESSOR, Design of Assembler, Data Structure, format of Databases, Algorithm, Macro instructions, Features of a macro facility, A two-pass algorithm and a single pass algorithm. LOADERS, Compile-and-go Loaders, General Loader Schemes, Absolute Relocating and Direct-Linking loaders.

TEXT BOOKS:

1. Peter Abel, IBM PC Assembly Language and Programming, Second Edition, PHI (Chapters 1 to 18, 20 to 22)
2. John J. Donovan, Systems Programming, McGraw Hill (Chapter 3,4 and 5).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III B.TECH. I-Semester

4 – 0 – 4

CSS3125

MANAGEMENT SCIENCE
(Common for all branches).

UNIT I:

Introduction to Management:
Concepts of Management and Organization – Functions of management – Evolution of Management Thought: Taylor's management, Fayol's Principles of management, Scientific Management, Douglas Mc Gregor's theory X and Theory Y, Mayo's Hawthorne Experiments, Herzberg's Two Factor theory of Motivation, Maslow's Hierarchy of Human Needs – Systematic Approach to Management – Principles of Organization – Types of Organization, Types of Organization Structure: Line Organization, Functional Organization and Line and staff Organization, Matrix Organization – Managerial Objectives – Organization, Social Responsibilities.

UNIT II:

Introduction to Operations Management:
Types of Plant layout – Methods of Production: Job, Batch and Mass production.
Work-study: Basic procedure involved in Method study and Work Measurement.

Statistical Quality control.
Materials management – objectives of Inventory control – EOQ-ABC Analysis – Purchase Procedure – stores – Management and stores records.
Marketing: Marketing vs Selling ,Marketing Mix, Stages in Product Life Cycle Channels of Distribution .

UNIT III:

Introduction to Human Resource Management (IIRM):
The concepts of IIRM, Human Resource Development (HRD) and Personnel Management & Industrial Relations (PMIR)-HRM and Basic Function of HR Manager : Manpower Planning ,Recruitment ,Selection ,Training, development , Placement ,Wage and Salary administration promotion ,transfer, separation,

Performance appraisal , grievance handling and welfare administration , job evaluation and Merit Rating.

UNIT IV :

Introduction to Strategic Management : Corporate Planning Process : Mission , goals , objectives , policy , strategy Programmes-Elements of Corporate Planning Process – Environmental Scanning : External Environment Analysis , SWOT Analysis – Stages „in Strategy Formulation and Implementation .

UNIT V:

Introduction to PERT/CPM: Network Analysis – Project Management – Programme Evaluation and Review Technique (PERT) vs Critical Path Method (CPM) – Identifying Critical Path – Probability of Completing the Project Within Given Time under PERT, Project Cost Analysis , Project Crashing.

Books for Reference :

1. Koontz and O'Donnell ,Principals of Management McGraw-Hill , 2001.
2. Phillip Kotler , Marketing , Management ,(11th Ed 2002) Prentice Hall of India.
3. Gary Dessler , Human Resource Management , Pearson Education Asia ,2002
4. L.S. Srinath , PERT/CPM , Affiliated East-West Press, New Delhi ,2002
5. W.Glueck & L.R.Jauch , Business Policy and Strategic Management ,McGraw-Hill ,1998
6. A.R.Aryasri ,Management Science For JNTU(B.Tech), Tata McGraw-Hill,2002
7. O.P. Khanna , Industrial Engineering & Management , Dhanpat Rai ,1999
8. Chandra Bose , Management And Administration , Prentice Hall,2002.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

III B.TECH. I-Semester

4 – 0 – 4

CSS3126

DATA COMMUNICATIONS

UNIT I:

Data communication introduction, Basic concepts, The OSI model, Signals, Encoding and modulation, Transmission of digital data, Interfaces and modems (chapters 1-6 of text book -1).

UNIT II:

Data Communication standards, Circuits, Codes, Error control, Synchronization, Serial and parallel interface hardware, Data modems (CCITT recommendations are not needed), Data communication Protocols, Asynchronous and Synchronous protocols, Public data networks (upto page -631) – (Chapters 13, 14 of text book -2).

UNIT III:

Local Area networks, Ethernet, Switched Ethernet, Fast Ethernet, Gigabit Ethernet, Token bus, Token ring, FDDI, metropolitan area networks, DQDB, SMDS, Point-to-Point protocols, PPP layers, LCP, NCP, Authentication (chapters 12, 13, 15 of text book -1).

UNIT IV:

Switching, Circuit, Packet and message switching, ISDN, Subscriber access to ISDN, ISDN layers, B-ISDN, X.25 layers, (Chapters 14, 16, 17 of text book -1).

UNIT V:

Frame relay, Operation Layers, ATM, Architecture of ATM, Switching in ATM networks, ATM layer, ATM service classes, SONET, Configuration of SONET, SONET layers, SONET frame (Chapters 18, 19, 20 of text book-1).

Text Books:

1. Data Communications and Networking B. A. Forouzan, 2nd Edition TMH
2. Electronic Communications Systems, W. Tomasi, 4th Edition, Pearson Education.

Reference Books:

1. Data Communications, Computer Networks and Open Systems, Fred Halsall, 4th Edition, Pearson Education.
2. Data and Computer Communications, W. Stallings, 6th Edition, Pearson Education.
3. Data Communications and Networking, A. S. Godbole, TMH.

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III B.TECH. I-Semester

0 – 3 – 2

CSS3127

INTERFACING THROUGH MICROPROCESSORS LAB

8086 Assembly Language Programming Exercises:

1. 16-bit addition
2. Sorting the n numbers in ascending & descending order.
3. Sum of squares of n numbers, sum of cubes of n numbers
4. Arithmetic mean of n numbers.
5. Interfacing of switch and display
6. Interfacing of A/D converter
7. Interfacing of D/A converter
8. Stepper motor control using microprocessor
9. Interfacing Keyboard/Display controller
10. Implementation of real time clock
11. Microprocessor based temperature controller
12. Microprocessor based traffic controller

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III B.TECH. I-Semester

0 – 3 – 2

CSS3128

SYSTEM PROGRAMMING LAB

1. Fixed Point arithmetic
2. Text processing
3. Keyboard and screen processing
4. Macro writing
5. Disk processing
6. Memory resident programs
7. DOS file management
8. Copy protection schemes
9. Implementation of simple editor
10. Adding Syntax directed facilities to an editor.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III B.TECH. II-Semester

4 - 0 - 4

CSS3221

COMPUTER NETWORKS

Unit-I:

Review of protocol layering, Data link layer, Design issues, Elementary data link protocols, Sliding window protocol, Example data link protocols.

Unit-II:

The medium access sublayer, Channel allocation problem, Multiple access protocols, Review of IEEE standards for LANs, LAN bridges.

Unit-III:

The network layer, Design issues, Routing algorithms, Congestion control algorithms, The Transport layer, Transport services, Transport protocols.

Unit-IV:

Internetworking, Internet network layer, Internet transport protocols (TCP and UDP), ATM network layer, ATM transport protocols.

Unit-V:

The application layer, Security, DNS, SNMP, Electronic Mail, WWW, Multimedia.

Text Book:

1. Computer Networks: A. S. Tanenbaum, 3rd Edition, PHI.

Reference Books:

1. An engineering Approach to Computer Networking, S. Keshav, Pearson Education.
2. Computer Networking a Top-Down Approach Featuring the Internet, J. F. Kurose, K. W. Ross, Pearson Education.
3. Data Communications and Networking, A. S. Godbole, TMH.

UNIT-I

Software and Software Engineering, The importance of software – software – software myths – software engineering paradigms – generic view of software engg. Software metrics. Measures and metrics – estimation – risk analysis – scheduling – Size oriented Metrics – function oriented metrics – Metrics – metrics of software quality.

UNIT II

Software project estimation and planning, Decomposition techniques – LOC and FP estimation – effect estimation – risk analysis – identification – projection – assessment – management and monitoring – software re-engineering. Requirement analysis. Requirement analysis – tasks – analyst – software prototyping – specification principles – representation and the software requirements specification.

UNIT III

Object oriented analysis and data modeling – Object oriented concepts – identifying objects – specifying attributes – defining operations – inter object communication – finalizing object definition – object oriented analysis modeling – data modeling – data objects, attributes and relationships – entity relationship diagrams. Alternative analysis techniques requirement analysis methods – data structured oriented methods – data structured system development – Warner diagrams and the DSSD approach – Jackson system development.

UNIT IV

Software design fundamentals – the design process – design fundamentals – effective modular – design – data flow oriented design – transform analysis – transaction – analysis – design heuristics. Object Oriented design – methods – refining operations – Program components & interfaces – implementation detail design. User interface design – human factors – human computer interface design – interface – design guidelines – Interface standards.

UNIT V

Software quality Assurance – Software quality factors – Quality assurance, quality metrics – Halstead's S/W Science. Software, Testing Techniques S/W testing fundamentals – White Box testing, Blackbox – testing, Validation Testing, system Testing, debugging, software maintenance maintainability – maintenance tasks – Reverse engineering and Re-engineering.

TEXT BOOK:

Software Engineering, Roger S. Pressman Mc.Graw Hill.

Reference:

3. Object Oriented Analysis, Peter Coad, Edward yourdon, Pearson Education.
2. Object Oriented Systems Development, Ali Bahrami, Mc Graw Hill

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III B.TECH. II-Semester 4 - 0 - 4 CSS3223
ADVANCED COMPUTER ARCHITECTURE

UNIT I

Trends towards parallel processing, parallelism in uniprocessor systems, parallel computer structures, architectural classification schemes, parallel processing applications, memory hierarchy in parallel processing systems, addressing schemes. Pipeline concept, linear pipelining and space time diagram, classification of pipeline processors, nonlinear pipeline and reservation table, interleaved memory organization, arithmetic pipelines, principles of designing pipeline processors, vector processing.

UNIT II

SIMD array processors, organization, masking and routing mechanisms, inter PE communications, SIMD inter connection networks, single stage and multi stage networks, mesh connected Illiac networks, parallel shifter, shuffle exchange and omega networks, parallel algorithms for array processors, matrix multiplication, polynomial evaluation, parallel sortings, fast fourier transform computation, associative array processor.

UNIT III

Multiprocessor architecture, loosely coupled and tightly coupled multiprocessor systems, processor characteristics, inter connection networks crossbar switch and multi port memories, multi stage networks, banyan and delta networks parallel memory organization, multiprocessing operating systems, classification and requirements, software requirements for MPS, language features to exploit parallelism, multi processor scheduling strategies, parallel algorithms.

UNIT IV

Data flow computers, control flow versus data flow, data flow computer architectures, data flow graphs, data flow languages, Dennis and Irvine machines, dataflow design alternatives, dependence driven and multi level event driven approaches, VLSI computing structures, systolic array architecture, VLSI matrix arithmetic processor.

UNIT V

Performance evaluation of computers, measurements and parameters, stochastic model simulation model, study of architecture of Cray and Cyber super computers, massively parallel processor systems, image processing on MPP, C.mmp multiprocessor system, crazy X MP super computer.

EXT BOOKS:

1. "Computer Architecture and parallel processing", Hwang K, Briggs F.A McGraw Hill.
 2. Scalable Parallel Computing , K. Hwang, Z. Xu, Mc Graw Hill.
- Reference:**
1. Advanced Computing Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson education.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III B.TECH. II-Semester

4 - 0 - 4

CSS3224

MATHEMATICAL MODELING AND SIMULATION

UNIT I

Art of modeling, Types of Models, Mathematical Models, Solution Methods Analytical, Numerical and Heuristic. Linear Programming – Formulation, Graphical Method, Simplex Method, Dual Simplex Method and Applications. Transportation and Assignment Models. A Brief Introduction to Integer and Non-linear Programming.

UNIT II

Deterministic Inventory Models – General Inventory Model, Static EOQ Models and Dynamic Inventory Model. Probabilistic Inventory Models – Continuous Review Models, Single-Period Models and Multiperiod Model. Selective Inventory Control – ABC, VED and FSN Analyses. Inventory Systems – Fixed Order Quantity System, Two-bin System, Periodic Review System, Optional Replenishment System and MRP.

UNIT III

Queuing Theory – Basic Structure of Queuing Models, Role of Exponential Distribution, Birth-and-Death Process, Queuing Models Based on the Birth-and-Death Process, Queuing Models involving Non-exponential Distributions, Priority-Discipline Queuing Models and Queuing Networks. Applications of Queuing Theory – Decision Making, Formulation of Waiting-Cost Function and Decision Models.

UNIT IV

CPM and PERT– Network Representation, Critical Path Calculations, Construction of Time Schedule. Simulation-Introduction, General Principles Random-Number Generation, Random-Variate Generation, Simulation Software.

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UNIT V

Input Modeling, Verification and validation of Simulation Models, Output Analysis for a Single Model, Comparison and Evaluation of Alternative System Designs, Simulation of Computer Systems.

Text Books:

1. Introduction to Operations Research, Frederick S Hillier, and Gerald J Lieberman, 7th Edition, Tata McGraw-Hill, 2001 (Chapters 17 and 18 for Unit III)
2. Discrete – Event System Simulation, Jerry Banks, John S Carson II, Barry L. Nelson, and David M. Nicol, 3rd Edition Pearson Education Asia, 2001 (Chapters 1, 3,4, 7 and 8 for Unit IV; Chapters 9, 10, 11, 12 and 14 for Unit V)
3. Operations research – An Introduction, 6th Edition, Prentice-Hall of India, 1999 (chapter 1 to 5 for Unit I and Chapters 11 and 16 for Unit II, Section 6.7 for Unit IV)

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III B.TECH. II-Semester 4 - 0 - 4 CSS 3225

FAULT TOLERANT SYSTEMS

UNIT-I

Basic Concepts:

Failure and Faults, reliability and failure rate, relation between eligibility and Mean-time – Between failures, maintainability and availability, reliability of series and parallel systems, Modeling of faults, stuck at, Bridging (short-circuit), stuck open, transient and intermittent faults.

Test Generation:

Fault diagnosis of digital systems, Test generation for combinational logic circuits – conventional methods, Random testing, transition count testing and signature analysis.

UNIT-II

Fault Tolerant Design:

Basic concepts – static, dynamic, Hybrid, and self-purging redundancy, shift-over Modular Redundancy (SMR). Triple Modular redundancy, SMR. Reconfiguration, use of error correcting codes. Time redundancy, software redundancy, fail soft-operation, examples of practical fault tolerant systems, Introduction to fault Tolerant Design of VLSI Chips.

UNIT III

Self Checking Circuits:

Design of Totally self-checking checkers, checkers using m-out-of-n codes, Berger codes and low cost residue code. Self-checking sequential Machines, partially self checking circuits.

Fail Safe Design:

Strongly fault secure circuits, failsafe Design of sequential circuits using partition theory and Berger codes, totally self-checking PLA design.

UNIT-IV

Design for Testable Combination Logic circuits:

Basic concepts of test ability, controllability and absorbability. The read-muller expansion technique, three level OR-AND-OR design, use of control logic and syndrome-testable design.

UNIT-V

Design of Testable Sequential circuits: The scan-path technique – level sensitive scan design (LSSD) and Random Access scan technique, built-in-test, built-in-test of VLSI chips, design for autonomous self-Test, Designing Testability into logic Boards.

TEXT BOOKS:

1. Fault Tolerant and Fault Testable Hardware design Parag K. Lala PHI 1985.

REFERENCE BOOKS:

1. Digital systems design using PLD's LALA, PHI 1990.
2. Logic Design theory, N. N. Biswas, PHI 1990

ADVANCED UNIX PROGRAMMING

UNIT I:

Unix Utilities – 1

Introduction to Unix file system. Vi editor, File handling utilities, security by file permissions, process utilities, disk utilities, Networking commands, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, umask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin.

Unix utilities – 2

Text processing utilities and backup utilities detailed commands to be covered are: cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, more, pg, comm., cmp, diff, tr, awk, tar, cpio.

What is a shell, shell responsibilities, pipes and input redirection, Output redirection and here documents, the shell as programming Language shell variables, conditions, history and control structures and shell programming.

UNIT II:

Unix Internals - 1

Unix file structure, directories, files and devices, system calls and device drivers, Library functions, low-level file access (write, read, open, close, ioctl, lseek, fstat, stat, dup and dup2), the standard I/O (fopen, fread, fclose, fflush, fseek, fgetc, getc, getchar, fputc, putc, putchar, fgets, gets), formatted, I/O stream errors, streams, and file descriptors, file and directory maintainance (chmod, chown, unlink, link symlink, mkdir, rmdir, chdir, getcwd).

UNIT III:

Unix internals – 2

Process and signals:- what is process, process structure, starting new process, waiting for a process, zombie process, process control, process identifiers, fork Function, vfork, exit, wait, exec, system, functions, user identification, process times.

Signal: Signal functions, reliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, system, sleep functions.

UNIT IV:

Unix Internals – 3

Data Management:- Management Memory (simple memory allocation, freeing memory) file locking (creating lock files, locking regions, use of read/write* locking, competing locks, other commands, deadlocks).

UNIT V:

Unix Internals – 4

Inter-process:- Pipe, process pipes, the pipe call, parent-child process, named pipes: FIFOs, Semaphores, message queues and shared memory applications of IPC.

TEXT BOOKS:

1. Advanced programming in Unix Environment, W. Richard Stevens.
2. Unix Network Programming, W. Richard Stevens.

Reference:

1. Unix network Programming: Networking, API, Sockets, XTI vol I. II edition, W. Stevens, PHI.
2. Unix Network programming, Inter process communication vol II, II edition, W. Stevens, PHI.

ADVANCED UNIX PROGRAMMING LAB

1. Write a shell script for sorting, searching and insertion / deletion of elements in a list.
2. Create two processes to run a for loop which adds numbers 1 to n, say one process adds odd numbers and the other even.
3. By creating required number of processors, simulate a communication between them as below:
 - (1). Process I sends to process j in the format: I, j . data , and process j prints the same after reading it.
 - (2). If two or more processes send data to the same process j, they will wait and process j all the data at the end of complete reception.
 - (3). Establish a two-way communication between a specific processes only.
4. Create a file that is shared among some users. Write a program that finds whether a specific user has created read or write operations on the file.
5. Create a shared lock and exclusive lock among some number of processes, say 1 to 10 on any data of 100 elements. For example process 5 wants a shared lock on elements 5 to 50 or process 8 wants exclusive lock on elements 32 to 45. Create access violations on the locks and show what occurs, then.
6. Create a semaphore operation on a shared file for write but not read.
7. Create a distributed key among some processes which exchange messages of the form: (m,T,I) for resource sharing, where m = request, reply, release, T = time stamp and I = process id.
8. Show mutual exclusion in problem 7 above.

COMPUTER NETWORKS LAB

1. Implement the data link layer framing methods such as character, cant character stuffing and Bit stuffing .
2. Implement on a data set of characters the three CRC polynomials – CRC 12 , CRC 16 and CRC CCIP .
3. Implement Dijkstra 's algorithm to compute the Shortest path through a graph.
4. Take an example subnet graph with weights indicating delay between nodes .
5. Now obtain Routing table art each node using distance vector routing algorithm
6. Take an example subnet of hosts. Obtain broadcast tree for it.
7. Take a 64 bit plain text and encrypt the same using DES algorithm .
8. Write a program to break the above DES coding
9. Using RSA algorithm Encrypt a text data and Decrpt the same .

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IV B.TECH. I-Semester 4 – 0 – 4 CSS4121

PERFORMANCE EVALUATION OF COMPUTER SYSTEMS

UNIT I:

Introduction: Motivation, Probability Models, Sample Space, Events, Algebra of Events, Graphical Methods of Representing Events, Probability Axioms, Discrete Random variables, Random Variables and their Event Spaces, Distribution Functions, Special Discrete Distributions, Analysis of Program MAX, The probability generating function, Discrete Random Vectors, Independent Random Variables, Continuous random variables, The Exponential Distribution, The reliability, failure density and hazard function, Some Important Distributions, Functions of a Random variable, Jointly distributed random variables, order statistics.

UNIT II:

Expectation: Moments, Expectation of Functions of More Than One Random Variable, Transform Methods, Moments and Transforms of some Important Distributions, computation of Mean Time to Failure, Inequalities and Limit Theorems, Conditional distribution and Conditional Expectation: Mixture distributions, Conditional Expectation, Imperfect Fault coverage and reliability, Stochastic Processes: Classification of Stochastic Processes, The Bernoulli Process, The Poisson Process, Renewal Processes, Availability Analysis, Random Incidence, Renewal Model of Program Behavior.

UNIT III:

Discrete-Parameter Markov Chains: Computation of n-step Transition Probabilities, State Classification and Limiting Distributions, Distribution of Times between state changes, Irreducible finite chains with Aperiodic states, The M/G/1 Queuing system, Discrete Parameter Birth-Death Processes,

Finite Markov chains with absorbing states, Continuous-Parameter Markov chains: The Birth and Death Process, Other special cases of the Birth-Death Model, Non-Birth-Death Processes, Markov chains with absorbing states, Networks of Queues: Open Queuing Networks, Closed Queuing Networks, Nonexponential Service-Time Distributions and Multiple Job Types, Non-Product-Form Networks.

UNIT IV: (Selective chapters from 2nd Text Book).

SIMD Computers and performance Enhancement: The space of SIMD computers, Array and Associative Processors, SIMD Computer Perspectives, The Illiac IV and the BSP Systems, The Illiac IV System Architecture, Applications of Illiac IV, The Massively Parallel Processor, The MPP System Architecture, Performance Enhancement Methods: Parallel memory Allocation, Array Processing Languages, Performance Analysis of Array Processor4s, Multiple-SIMD Computer Organization.

UNIT V: (Selective chapters from 2nd Text Book).

Example Multiprocessor Systems, The space of Multiprocessor Systems, The C.mmp Multiprocessor System Architecture and Performance, The S-1 Multiprocessor System Architecture and performance, The HEP Multiprocessor System Architecture and performance, Mainframe Multiprocessor Systems Architecture and performance, The Cray X-MP System Architecture and performance.

TEXT BOOKS:

1. Probability & Statistics with Reliability, Queuing, and Computer Science Applications, Kishor S. Trivedi, PHI.
2. Computer Architecture and Parallel Processing, Kai Hwang, Faye A. Briggs, MGH.

REFERENCE:

Computer Networks and Systems: Queueing Theory and Performance Evaluation, Thomas G. Robertazzi, Springer-Verlag.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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IV B.TECH. I-Semester 4 – 0 – 4 CSS4122

COMPUTER SYSTEMS MAINTENANCE

UNIT I:

An inside look at a Contemporary pc: The Contemporary PC, Disassembly / Reassembly Notes, Standardized Form Factors, An Inside look at monitors: Working with On-Screen Controls, Notes on Monitor Disassembly and Reassembly, An Inside look at Operating Systems and the Boot Process, Hardware, Understanding Popular OS features, A Closer look at MSDOS, The Boot Process, Creating Dos Boot Disk, Arranging the preservice Checkout: Benchmarking the PC, Viruses and Computer Service, Quick-Start Bench Testing.

UNIT II:

BIOS: Typical Motherboard BIOS, BIOS Features, BIOS and Boot Sequences, BIOS Shortcomings and Compatibility Issues, BIOS Troubleshooting, BIOS Upgrades, BUSES: Industry Standard Architecture (ISA), Peripheral Component Interconnect (PCI), Accelerated Graphics Port (AGP), CD-ROM, CD-R and CD-RW Drives: The CD-ROM Drive, The CD-R Drive, Chipsets: Ali Chipsets, AMD Chipsets, Intel Chipsets, VIA Chipsets

UNIT III:

CPU Identification and Troubleshooting: CPU Essentials, Modern CPU Concepts, The Intel CPU's, The AMD CPU's, The VIA Cyrix CPUs, CPU Over locking, Troubleshooting CPU Problems, Data Recovery Techniques: Understanding Data Loss, Protecting Drives and Data, Recovering Files and Folders, Recovering FAT and Directory Damage, Recovering the MBR, Drive Adapters and RAID Basics: Controller Installation, RAID Primer.

UNIT IV:

Floppy and LS-120 Drives: The Floppy Drive, The LS-120 Drive, Floppy and LS-120 Troubleshooting, Hard Drives, Basic Drive Concepts, IDE Drive Standards and Features, Drive Construction, Drive Preparation Concepts, Drive Capacity Limits, Drive Installation/ Replacement Guidelines, Drive Testing and Troubleshooting.

UNIT V:

Memory Troubleshooting: Essential Memory Concepts, Memory Packages and Structures, Logical Memory Organization, Memory Considerations, Parity, Selecting and Installing Memory, Memory Troubleshooting, Mice and Trackballs: The Mouse, The Trackball, Cleaning a Pointing Device, Troubleshooting and Pointing Device, Monitor Troubleshooting, Mother board troubleshooting, Parallel port Troubleshooting, Plug-and-Play Configuration and Troubleshooting, Serial and Infrared Port Troubleshooting,

Text Book:

1. Troubleshooting Maintaining & Repairing PCs, Bigelow, 5th Edition, Tata McGraw Hill.
2. Upgrading and Repairing of PCs, Scott Muller, PHI, 2000.

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IV B.TECH. I-Semester

4 – 0 – 4

CSS4123

NETWORK ADMINISTRATION

UNIT I:

The system Components:

What is “The System”, Operating Systems, File Systems, Processes and Job control, Logs and Audits, Privileged Accounts, Hardware Awareness, System Uniformity.

Network Communities:

Communities, User Sociology, Client-Server Cooperation, Host Identities and Name Services, Common Network Sharing Models, Physical Network, TCP/IP Networks, Network Analysis, Planning Network Resources.

UNIT II:

Host Management:

Choices, Start-up and Shutdown, Configuring and Personalizing Workstations, Installation of the Operating System, Software Installation, Installing a Unix Disk, Kernel Customization.

User Management:

User Registration, Account Policy, Login Environment, User Support Services, Controlling User Resources, User Well-being

UNIT III:

Models of Network Administration:

Administration Models, Immunity and convergence, Network Organization, Bootstrapping Infrastructure, Cfengine: Policy Automation, SNMP Network Management, Integrating Multiple OSes, A model Checklist.

Configuration and Maintenance:

System Policy, Synchronizing Clocks, Executing Jobs at Regular Times, Automation, Preventive Maintenance, Fault Report and Diagnosis, System Performance Tuning.

UNIT IV:

Services:

High Level Services, Proxies and Agents, Installing a new Service, Summoning Daemons, Setting up the DNS Name

Service, Setting up a WWW Server, E-mail Configuration, Mounting NFS Disks, The Printer Service.

Principles of Security:

Physical Security, Four Independent Issues, Trust Relationships, Security Policy, Protecting from Loss, System and Network Security, Social Engineering, TCP/IP Security, Attacks.

UNIT V:

Security Implementation:

The Recovery Plan, Data Integrity, Analyzing Network Security, VPNs: Secure Shell and FreeS/WAN, WWW Security, Firewalls, Intrusion Detection and Forensics.

Analytical System Administration:

Science Vs Technology, Studying Complex Systems, The Purpose of Observation, Evaluation Methods and Problems, Evaluating a Hierarchical System, Faults, Deterministic and Stochastic Behavior, Observational Errors, Strategic Analyses.

Text Books:

Principles of Network and System Administration, Mark Burgess, John Wiley & Sons Ltd.

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IV B.TECH. I-Semester

4 – 0 – 4

CSS4124

COMPUTER GRAPHICS

UNIT I:

Introduction to Computer Graphics: Points, Lines, Planes, Pixels, Frame Buffers, Video display devices, Logical and Physical Interactive devices, scanners.

Line drawing algorithms - DDA and Bresenham's. Bresenham's algorithm for circle and ellipse generation. Scan conversion and generation of display, Image compression, polygon generation, polygon filling algorithms, anti aliasing, Halftoning.

UNIT II:

Two Dimensional transformations: Scaling, Rotation, Translation, homogeneous coordinates. Rotating about an arbitrary point, reflection zooming, shear.

Windowing and Clipping: window, view port, viewing transformations. Clipping, line and polygon clipping generalized clipping, multiple windowing.

UNIT III:

3D Graphics: 3D Transformations, composition of 3D transformations, projections, 3D viewing, hidden surfaces, Z buffer algorithms, painter's algorithm, shading algorithm.

UNIT IV:

Curves and Surfaces: Generation of curve and surfaces using Hermit Bezier and B-Spline, sweeping method of interpolation. Color chromatic, Trichromatic color theory, color models for raster graphics reproduction of color.

UNIT V:

Rendering: Models transparency, shadows, textures mapping. Animation: conventional and computer assisted animation. Animation languages. Methods of controlling animation. Basic rules of animation. Problems peculiar to animation.

TEXT BOOKS:

- 1) Procedural Elements for Computer Graphics. David F. Rogers McGraw-hill International 2nd edition.
- 2) Computer Graphics principles and practices Foley, Van Dam, Friner, Hughes. Pearson Education Asia
- 3) Computer Graphics, Steven Harrington - TMH
- 4) Computer Graphics, Donald Hearn & Pauline Baker PHI (EEE).

Reference:

1. Introduction to Computer Graphics N. Krishna Murthy, TMH
2. Computer Graphics for scientists and engineers, R. G. S. Asthana and N. K. Sinha, New age international (P) Ltd.

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IV B.TECH. I-Semester

4 – 0 – 4

CSS4125

**VLSI SYSTEMS DESIGN
(Elective I)**

UNIT – I:

Introduction to Digital Systems and VLSI
Why Design Integrated Circuits? Integrated Circuit (IC) Manufacturing – Technology and Economics. CMOS Technology. IC Design Techniques.

Unit – II:

Transistors and Gates
Transistors and Layout. Fabrication Processes. Transistors. Wires and Vias. Design Rules. Layout Design and Tools.
Logic Gates. Combinational Logic Functions. Static Complementary Gates. Wires and Delay. Switch Logic. Alternative Gate Circuits.

Unit – III:

Combinational Networks and Sequential Machines
Combinational Logic Networks. Layout Design Methods. Simulation. Combinational Network Delay. Crosstalk. Power Optimization. Switch Logic Networks. Combinational Logic Testing.
Sequential Machines. Latches and Flip-Flops. Sequential Systems and Clocking Disciplines. Sequential System Design. Power Optimization. Design Validation. Sequential Testing.

Unit – IV:

Subsystem Design, Floor Planning, and Architecture Design
Subsystem Design Principles. Combinational Shifters. Adders. ALUs. Multipliers. High-Density Memory. Field Programmable Gate Arrays. Programmable Logic Arrays. Floor Planning Methods. Off-Chip Connections.
Architecture Design. Register-Transfer Design. High-Level Synthesis. Architecture for Low Power. Architectural Testing.

Unit – V:

Chip Design and CAD Systems & Algorithms
Design Methodologies for Chip Design. Case Studies: Timer Chip and PDP-8 Data Path.
CAD Systems. Simulation. Layout Synthesis. Layout Analysis. Timing Analysis and Optimization. Logic Synthesis. Test Generation. Sequential Machine Optimizations. Scheduling and Binding. Hardware/Software Co-Design.

TEXT BOOKS:

1. Modern VLSI Design: Systems on Silicon, Wayne Wolf, Pearson Education Asia, 1998, 2nd Edition, ISBN: 81-7808-128-8.
2. Introduction to VLSI Circuits and systems, John P.Uyemura, John wiely and sons, 2002, ISBN: 9971-51-417-6

REFERENCES:

1. Application Specific Integrated Circuits, Michael John Sebastian Smith, Pearson Education Asia, 1997, Low Priced Indian Edition, ISBN: 81-7808-007-9.

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IV B.TECH. I-Semester 4 – 0 – 4 CSS4126

DISTRIBUTED OPERATING SYSTEMS
(Elective I)

UNIT I:

Introduction to Distributed Systems : Distributed Systems : Goals
Hardware Concepts Software- design. Communication in
Distributed Systems : Layered Protocol - ATM Networks Client
server model-remote procedure call- group communication.

UNIT II:

Synchronization : Clock Synchronization – mutual Exclusion –
election atomic transactions – dead locks.

UNIT III: Processes and Processors : Threads – system models
processor allocation – Scheduling fault tolerance – real time
distributed systems.

UNIT IV:

Distributed file systems: File System design and implementation
– trends in distributed file systems.

UNIT V:

Shared Memory : Introduction – bus based multi processors ring
based multiprocessors switched multiprocessors – NUMA
comparison of shard memory systems – consistency models –
page based distributed shared memory – shared variable
distributed shared memory – object based distributed shared
memory.

TEXT BOOK:

Distributed Operating System , Andrew S. Tanenbaum, Prentice
Hall International Inc, 1995.

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IV B.TECH. I-Semester 4 – 0 – 4 CSS4127

EMBEDDED SYSTEMS
(Elective II)

UNIT I:

An Overview of Embedded Software, Applications of Embedded
Systems, Hardware Architectures for Embedded Systems,
Developing for Embedded Systems, Embedded Software
Development Environments. Hardware Fundamentals for the
Software Engineer: Terminology, Gates, Timing Diagrams and
Memory.

UNIT II:

Advanced Hardware Fundamentals, Microprocessors, Buses,
Direct Memory Access, Interrupts, Other Common Ports,
Conventions Used in Schematics. Interrupts, Microprocessor
Architecture, Interrupt Basics, The Shared-Data Problem,
Interrupt Latency.

UNIT III:

Operating System Basics, Round-Robin, Round-Robin with
Interrupts, Function-Queue-Scheduling Architecture, Real-Time
Operating System Architecture. Introduction to Real-Time
Operating Systems, Tasks and Task States, Tasks and Data,
Semaphores and Shared Data.

UNIT IV:

More Operating System Services, Message Queues, Mailboxes,
and Pipes, Time Functions, Events, Memory Management,
Interrupt Routines in an RTOS Environment, Basic Design Using
a Real-Time Operating System, Encapsulating Semaphores and
Queues, Hard Real-Time Scheduling Considerations, Saving
Memory Space and Power.

UNIT V:

Embedded Software Development Tools, Host and Target
Machines, Linker/Loaders for Embedded Software, Getting
Embedded Software into the Target System, Debugging
Techniques, Testing on Your Host Machine, Instruction Set

2002-2003

Simulators, Using Laboratory Tools, Serial Communication Programming.

UNIT VI:

Case study: Embedded Database Applications, Networked Java-Enabled Information Appliances, Mobile Java Applications, Software Development in Windows XP Embedded.

Text Books:

1. An Embedded Software Primer by David E. Simon, Pearson Education.
2. Programming for Embedded Systems by Dreamtech Software Team, Wiley Publishing Inc.

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IV B.TECH. I-Semester

4 – 0 – 4

CSS4128

**REAL TIME SYSTEMS
(Elective II)**

UNIT I:

Introduction

Definition and Classification of Real time systems: Concept of computer control, sequence, loop and supervisor control, centralized, hierarchical and distributed systems, Human Computer interface, hardware requirement for real time applications, specialized processors, interfaces, communications.

UNIT II:

Real Time Languages:

Special features of languages for real time application, review of data types, concurrency, exception handling, coroutines, low level facilities. Overview of Real time languages, modula 2 and Ada as a Real Time Languages.

Real Time Operating Systems: (PSOS+V, WORKS).

Scheduling strategies, priority structures, Task management, Real Time Clock Handler, Code sharing, Resource Control, Intertask Communication and Control, Example of Creating and RTOS based on modula 2 kernel; Practical Real Time Operating Systems.

UNIT III:

Design Aspects:

Introduction to Design of Real Time Systems, Specification, Preliminary Design, multitasking Approach, monitors, Rendezvous.

Development Methodologies: Yourdon, Methodology, Ward and Mellor Method, HATLEY & Pribhai method, MASXOT, PAISLEY System.

UNIT IV:

Design Analysis:

Introduction:

Petrinets, Analysis of Petri Nets, Scheduling problem Real Time Database, Real Time Vs General Purpose Databases,

Transaction priorities and Aborts, Concurrency Control, Disk Scheduling Algorithms, Maintaining Serialization Consistency.

UNIT V:

Fault Tolerance Techniques: Introduction: Faults, Errors and Failures, Fault types, Detection and Containment, Redundancy, Integrated Failure Handling.

Reliability Evaluation: Introduction, Parameters, Reliability Models for Hardware, Software Error Models.

Text Books:

1. Real Time Computer Control, Stuart Bennett, PHL 1997.
2. Real Time Systems, Krishna C. M. & Kand Shin G.Mc Graw Hill, 1997, L. R. Rabiner & R. W. Schafe.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

IV B.TECH. I-Semester

0 – 3 – 2

CSS4129

COMPUTER SYSTEMS MAINTENANCE LAB

1. Identify the P8, P9 AT/Style power connections, ATX Style power connections, Mother Board, Expansion Slots, ISA, PCI, AGP, USB, AMR parts of the Computer. Identify the Mother board ports and RAID Controllers. Identify the Video Controllers, Identify the IDE Drive, SCSI Drive Controllers. Identify the CDROM Drives and other drives.
2. Locate the Disk Information through a Windows Dialog Box.
3. Using the COMMAND.COM file understand the dual boot capabilities, Automatic Graphical Starter, Boot Delay and related variables.
4. Using the Startup Disk marker, create a DOS Startup Disk.
5. Understand the POWER ON SELF TEST (POST) and System Service routines, BIOS features.
6. Implement all the steps in a Conflict Troubleshooting Process.
7. Configure the Main Scandisk dialogues.
8. Using the Disk clean up wizard, recover wasted disk space.
9. Understand the digital USB Port.
10. Understand the steps in creating a new user and installing the drives.

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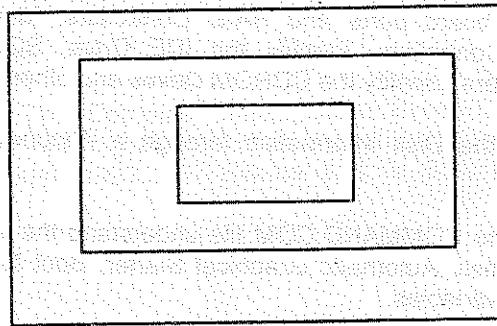
IV B.TECH. I-Semester

0 – 3 – 2

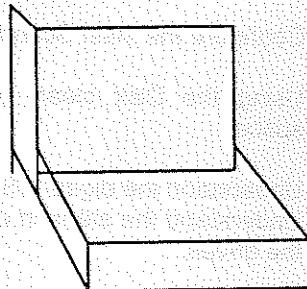
CSS4130

COMPUTER GRAPHICS LAB

- Write a program to draw the following figure on the display using scaling operations. Now delete the figure in stages starting from the innermost rectangle.



- Write an interactive program to generate a curve passing close to a set of points. Note that as you feed the coordinates interactively, the curve goes on till a specified end point.
- Write a program to implement a general filling algorithm.
- Write a program for scaling and skewing of the following figure.



- Write a subroutine for displaying of an item at a specified location on the display and then drag it using input device.

- Write a program for displaying a histogram of the prices of three objects for five years.

Item	Year 1	Year 2	Year 3	Year 4	Year 5
A	1200	1300	1400	1600	1700
B	1100	1700	1600	1800	2000
C	1400	1800	2200	2100	1900

- Given an object of 2-D, perform scaling, rotation, translation interactively.
- Implement an algorithm for removal of hidden surfaces.

Text Book:

- Computer Graphics for Scientists and Engineers, 2nd Edition, Asthana and Sinha, New Age.

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IV B.TECH. II-Semester 4 – 0 – 4 CSS4221

**ADVANCED DATABASES
(ELECTIVE-III)**

UNIT-I

Distributed databases features – distributed database management systems – Review of databases and computer networks. Levels of distribution transparency – reference architecture – types of data fragmentation – distributed transparency for read only applications and update applications – distributed database access primitives and integrity constraints.

UNIT-II

Distributed database design – a frame work for distributed database design – the design of database fragmentation – the allocation of fragments. Translational global queries to fragment queries – equivalence transformation for queries – transforming global queries into fragment queries – distributed grouping and aggregate function evaluation – parametric queries.

UNIT-III

Query optimization – problems in query optimization – objectives in query process optimization – similar representation of queries – model for query optimization – join query – general queries.

UNIT-IV

Distributed transactions and concurrency control. Frame work for transaction management – properties and goals of transaction – atomicity of distributed transactions – recovery procedures – concurrency control for distributed transactions. Foundations of distributed concurrency control – distributed deadlocks – concurrency control based on time stamps.

UNIT-V

Reliability and protection: Basic concepts – non-blocking commitment protocols. Reliability and concurrency control – determining a consistent view of network – detection and resolution of inconsistency – check point and cold restart – Authorization and protection – site to site protection – user identification – authorization rules.

TEXT BOOK:

1. Ceri and Pelagatti "Distributed databases principles and systems" McGraw Hill.

REFERENCE BOOK:

1. Raghuramakrishnan – "Database management system" McGraw Hill.

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**MULTIMEDIA SYSTEMS
(Elective III)**

UNIT I:

Applications of multimedia, Delivery of Multimedia, historical Context, Multimedia Production, Terminology, Interactivity, Social and Ethical Considerations, A New Medium, Further Information.

Enabling Technologies: Digital Representations, Hardware Requirements, Software, Networks, Standards, Further Information.

UNIT II:

Introduction to Computer Graphics:

Vector Graphics and Bitmapped Graphics, Combining Vectors and Bitmaps, File Formats, Further Information.

Vector Graphics: Fundamentals, Shapes, Transformations and Filters, 3-D Graphics, Further Information.

Bitmapped Images: Resolution, Image Compression, Image Manipulation, Geometrical Transformations, Further Information.

UNIT III:

Color:

Color and Science, RGB Color, Other Color models, Channels and Color Correction, Consistent Color Further Information.

Characters and Fonts:

Character Sets, Fonts, Further Information.

Layout:

Text in Graphics, Markup, Text Layout Using HTML and CSS, Portable Documents, Further Information.

UNIT IV:

Hypertext:

A Short History of Hypertext and Hypermedia, The Nature of Hypertext, Links, Navigation and Structure in Hypertext, Further Information.

Video:

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Digitizing video, Video Standards, Introduction to Video Compression, Quick Time, Digital Video Editing and Post-Production, Streamed Video and Video Conferencing, Further Information.

Animation:

Captured Animation and Image Sequences, Digital Cel and Sprite Animation, Key Frame Animation, 3-D Animation, Further Information.

UNIT V:

Sound:

The Nature of Sound, Digitizing Sound, Processing Sound, Compression, Formats, MIDI, Combining Sound and Picture, Further Information.

Combining Media:

Hypermedia, Synchronization-Based Presentations, Accessibility, Further Information.

Text Book:

1. Digital Multimedia, Nigel Chapman and Jenny Chapman, John Wiley & Sons LTD.

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CSS4223

**DATA MINING AND DATA WAREHOUSING
(ELECTIVE IV)**

UNIT-I:

Introduction – Data warehouse delivery method – system process – typical process flow within a data ware house – query management process – process architecture – meta data – data marting.

UNIT-II:

Design aspects – Designing dimension tables – Designing starflake scheme – Multi dimensional scheme – partitioning strategy, aggregator – Data marting META DATA – System Data warehouse, process – load manager.

UNIT-III:

Hardware and operational design – server hardware, network hardware – parallel technology – security input on design of Hardware – backup and recovery – Service level management – Operating the datawarehouse.

UNIT-IV:

Capacity planning – Estimating the load – Timing the data warehouse – Assessing performance – Taking the data load and queries – Testing data warehouse – Development of test plan – Testing the data base and operational environment. Decision Trees, Tree construction, Best split, indices for split, criteria for splitting, construction, algorithms, pruning techniques and algorithms.

UNIT V:

Web mining, context, structure and usage minings, Text mining, hierarchy of clustering, text clustering. Temporal and spatial data mining, Association rules, sequence mining, ap, SPADE, SPIRIT, WVM algorithms, episode discovery, event prediction problem, time series, spatial mining, tasks, clustering, trends.

TEXT BOOKS:

- 1) Data Warehousing in the real world – Sam Anabory & Dennis Murray – Addison Wesley, 1997.
- 2) Data Mining Techniques, A. K. Pujari, University Press, 2001, (Chapters 6,7 and 8).

REFERENCE BOOKS:

- 1) Data Warehousing in the real world, San Anohory , Bennis Murray ,Pearson Education .

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CSS4224

**CELLULAR AND MOBILE COMMUNICATIONS
(Elective IV)**

UNIT I:

Introduction to Cellular Mobile Systems:

A basic cellular system, performance criteria, Uniqueness of Mobile Radio Environment, Operation of cellular systems, planning and cellular systems, analog & cellular systems.

Elements of Cellular Radio Systems Design:

General description of the problem, concept of Frequency channels, co-channel Interference Reduction Factor, desired C/I from a normal case in an Omni directional antenna System, cell Splitting, consideration of the components of cellular systems.

UNIT II

Interference:

Introduction to co-channel interference, real time co-channel interference measurement, design of antenna system, antenna parameters and their effects, diversity receiver non co-channel interference- different types.

UNIT III:

Cell Coverage for Signal and Traffic:

General Introduction, obtaining the Mobile point-to-point mode propagation over water or flat open area, foliage loss, propagation near in distance, long distance propagation, point-to-point predication model – characteristics, cell site, antenna heights and signal coverage cells, mobile – to mobile propagation.

UNIT IV:

Cell Site Antennas and Mobile Antennas:
Characteristics, Antennas at Cell site, Mobile Antennas.

Frequency Measurement and Channel Assignment:

Frequency Management, Fixed channels assignment, Non-fixed channel assignment, traffic and channel assignment.

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UNIT V:

Hand-Off, Dropped Calls:

Why hand-off, types of hand off and their characteristics, dropped call rates and their evaluation.

Operational Techniques:

Parameters, Coverage hole filler, leaky feeders, cell splitting and small cells, narrow beam concept.

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REFERENCES:

- 1)
- 2)

1. Cellular and Mobile Communications by Lee, Mc Graw Hill.
2. Wireless Digital Communication by Dr. Kamilo Faher (PHI).

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