

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES::RAJAMPET
(AUTONOMOUS)**

www.aitsrajampet.ac.in



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
ACADEMIC REGULATIONS (R11)**

AND

COURSE STRUCTURE & SYLLABI

For the students admitted to

**B. Tech., Regular Four Year Degree Programme
from the Academic Year 2011-12**

and

B.Tech. Lateral Entry Scheme

(For the batches admitted from the academic year 2012-13)



B. Tech., COMPUTER SCIENCE & ENGINEERING

VISION AND MISSION OF THE INSTITUTION

Vision

We impart futuristic technical education and instill high patterns of discipline through our dedicated staff who set global standards, making our students technologically superior and ethically strong, who in turn shall improve the quality of life of the human race.

Mission

Our mission is to educate students from the local and rural areas and from other states so that they become enlightened individuals, improving the living standards of their families, industry and society. We provide individual attention, world-class quality of Technical education and take care of character building.

VISION AND MISSION OF THE DEPARTMENT

Vision

To become an advanced learning centre in the field of Computer Science and Engineering that make knowledgeable, skilful, socially responsible and ethical professionals.

Mission

To provide matured engineering graduates, who can serve nation and solve real world problems, with strong moral and professional convictions and interdisciplinary research capabilities.

ACADEMIC REGULATIONS
B.Tech. Regular Four Year Degree Programme
(For the batches admitted from the academic year 2011-12)
and
B.Tech. Lateral Entry Scheme
(For the batches admitted from the academic year 2012-13)

The following rules and regulations will be applicable for the batches of 4 year B.Tech degree admitted from the academic year 2011-12 onwards.

1. ADMISSION:

1.1 Admission into first year of Four Year B.Tech. Degree programme of study in Engineering:

As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of four year B.Tech Degree programme as per the following pattern.

- a) Category-A seats will be filled by the Convener, EAMCET.
- b) Category-B seats will be filled by the Management as per the norms stipulated by Govt. of Andhra Pradesh.

1.2 Admission into the Second Year of Four year B.Tech. Degree programme (lateral entry):

As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh.

2. PROGRAMMES OF STUDY OFFERED BY AITS LEADING TO THE AWARD OF B.TECH DEGREE:

Following are the four year undergraduate Degree Programmes of study offered in various disciplines at Annamacharya Institute of Technology and Sciences, Rajampet (Autonomous) leading to the award of B.Tech (Bachelor of Technology) Degree:

1. B.Tech (Computer Science & Engineering)
2. B.Tech (Electrical & Electronics Engineering)
3. B.Tech (Electronics & Communication Engineering)
4. B.Tech (Information Technology)
5. B.Tech (Mechanical Engineering)
6. B.Tech (Civil Engineering)
7. B.Tech (Civil Technology)

and any other programme as approved by the concerned authorities from time to time.

3. ACADEMIC YEAR:

The institute shall follow Year-wise pattern for First year course and Semester pattern for II, III and IV years. An academic year shall consist of a first semester and a second semester from second year onwards.

The first year of four year B.Tech programme shall have duration to accommodate a minimum of 180 instruction days. From second year onwards each semester shall have a minimum of 90 instruction days.

4. COURSE STRUCTURE:

Each programme of study shall consist of:

4.1 General Courses comprising of the following: (5 to 10%)

- i. Language / Communication Skills
- ii. Humanities and Social Sciences: Environmental Science
- iii. Economics and Accounting
- iv. Principles of Management

4.2 Basic Science Courses comprising of the following: (15 to 25%)

- i. Computer Literacy with Numerical Analysis
- ii. Mathematics
- iii. Physics
- iv. Chemistry

4.3 Basic Engineering Courses comprising of the following (depending on the branch): (15 to 25%)

- i. Engineering Drawing
- ii. Engineering and IT Workshop
- iii. Engineering Mechanics
- iv. Basic Mechanical Engineering
- v. Electrical and Electronics Engineering
- vi. Basic civil Engineering
- vii. Computer Programming

4.4 Compulsory Discipline Courses: (45 to 55%)

The lists of professional subjects are chosen as per the suggestions of the experts, to impart broad based knowledge needed in the concerned branch of study.

4.5 Elective Courses: (10 to 15%)

Electives will be offered to the students to diversify the spectrum of knowledge, based on the interest of the student to broaden his individual skill and knowledge.

4.6 In the final year first semester subject like comprehensive Computer Science & Engineering, with 2 hours / week to be introduced.

4.7 Every programme of study shall be designed to have 42-44 theory courses and 19-22 laboratory/seminar/comprehensive courses.

4.8 Contact Hours: Depending on the complexity and volume of the course, the number of contact hours per week will be assigned.

5. CREDIT SYSTEM:

Credits are assigned based on the following norms.

	Year Pattern		Semester Pattern	
	Period(s)/ Week	Credits	Period(s)/ Week	Credit(s)
Theory	01	02	01	01
Practical	03	04	03	02
Comprehensive Computer Science & Engineering	--	--	02	02
Seminar	--	--	01	01
Final Year Project	--	-	12	12

6. EXAMINATION SYSTEM: All components in any programme of study will be evaluated continuously through internal evaluation and an external evaluation component conducted as year-end/semester-end examination.

6.1 Distribution of Marks:

S. No		Marks	Examination and Evaluation	Scheme of Evaluation
1.	Theory	70	Year-end / Semester-end examination.	The question paper shall be of descriptive type with 8 questions out of which 5 are to be answered in 3 hours duration of the examination.
		30	<p>Mid - Examination of 120 Min. duration - Internal evaluation-20 marks. 5 questions - 1st question compulsory – having short answer questions, 4 descriptive out of which 3 are to be answered.</p> <p>Remaining 10 marks for Assignments, 3-5 in number will be given and each assignment will be evaluated for 10 marks and average considered.</p>	<p>For I B Tech: Three (03) mid exams, each for 20 marks are to be conducted. Average of best two performances to be considered.</p> <p>Mid-I: After first spell of instructions (II Units).</p> <p>Mid-II: After second spell of instructions (III to V Units)</p> <p>Mid-III: After third spell of instructions (VI to VIII Units)</p> <p>For a Semester: Two mid-exams, 20 marks each, are to be conducted. Better one to be considered.</p> <p>Mid-I: After first spell of instructions (IV Units).</p> <p>Mid-II: After second spell of instructions (V to VIII Units).</p>

S. No		Marks	Examination and Evaluation		Scheme of Evaluation
2	Laboratory, Design and / or drawing	70	Year-end / Semester-end Lab Examination.		For laboratory courses: 3 hours duration – two examiners. For drawing and/ or Design: like for the theory examination.
		30	20	Day to Day evaluation.	Performance in laboratory experiments.
			10	Internal evaluation.	Practical Tests (For first year average of best two out of three tests and for semester better one out of two tests)
3	Soft Skills – I and II	70	External Evaluation		The question paper shall be of objective type with 100 questions to be answered in 3 hours duration.
		30	20	Day to Day evaluation.	Performance in tests conducted at the end of every topic.
			10	Internal Evaluation.	Two mid-exams, 10 marks each, are to be conducted. Better one to be considered.
4	Seminar	100	Internal Evaluation: 20 Marks for Report. 20 Marks for subject content. 40 Marks for presentation. 20 Marks for Question and Answers.		Continuous evaluation during a semester by the Departmental Committee (DC).
5	Comprehensive Computer Science & Engineering	100	The marks can be allotted based on the performance in viva-voce conducted by Head of the department and two senior faculty members in the department.		
6	Project Work	100	70	External evaluation	Semester-end Project Viva-Voce Examination by Committee as detailed under 6.2
			30	Internal evaluation	Continuous evaluation by the DC 15 Marks by DC as detailed under 6.2.1 15 Marks by Supervisor.

6.2 Project Work Evaluation:

- 6.2.1** The Internal Evaluation shall be made by the Departmental Committee, on the basis of average of two seminars presented by each student on the topic of his project. The presentations shall be evaluated by the Departmental Committee (DC) consisting of Head of the Department, supervisor and a senior faculty member. .
- 6.2.2** The Semester-End Examination (viva-voce) shall be conducted by a Committee consisting of External examiner nominated by the Chief Controller of Examinations, HOD and Supervisor. The evaluation of project work shall be conducted at the end of the IV year.

6.3. Eligibility to appear for the year-end / Semester-End examination:

- 6.3.1** A student shall be eligible to appear for end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in the year/ semester.
- 6.3.2** Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in first year or each semester may be granted by the Institute Academic Committee, if the reason for shortage is convincing.
- 6.3.3** Shortage of Attendance below 65% in aggregate shall in no case be condoned.
- 6.3.4** A stipulated fee shall be payable towards condonation of shortage of attendance to the Institute.
- 6.3.5** Students whose shortage of attendance is not condoned in First year/any semester are not eligible to take their End examination of that class and their registration for that semester / year shall stand cancelled.
- 6.3.6** A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current year/semester, as applicable.
- 6.3.7** A student detained due to shortage of attendance, will have to repeat that year/semester when offered next.

6.4 Revaluation / Recounting:

Students shall be permitted to request for recounting/ revaluation of the end theory examination answer scripts within a stipulated period after payment of prescribed fee.

After recounting or revaluation, records are updated with changes if any and the student will be issued a revised memorandum of marks. If there are no changes, the student shall be intimated the same through a letter or a notice.

6.5 Supplementary Examination:

All Regular examinations are understood as Regular/Supplementary examinations. The supplementary students have to appear for the supplementary examinations along with their regular examinations conducted at the end of each semester. However, separate supplementary examinations will be conducted for the II-Semester subjects at the end of I-Semester and vice-versa. For seminar, a seminar will be given by the supplementary candidate as per the separate schedule given by the exam section.

7. ACADEMIC REQUIREMENTS FOR PROMOTION/ COMPLETION OF REGULAR B.TECH PROGRAMME OF STUDY:

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/ completion of regular B.Tech Programme of study.

7.1 For students admitted into B.Tech. (Regular) programme:

- 7.1.1** A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, 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. For the seminar he should secure a minimum of 40% marks.
- 7.1.2** For promotion from I B.Tech to II B.Tech a student must satisfy the attendance requirements in I year.
- 7.1.3** A Student shall be promoted from II year to III year, if he fulfills the academic requirements of securing a minimum of **56** credits from I year, II year I-Semester and II year II-Semester examinations conducted till that time.
- 7.1.4** A student shall be promoted from III year to IV year if he fulfills the academic requirements of securing a minimum of **86** credits from I year, II year I and II-Semesters and the III year I and II-Semester examinations conducted till that time.
- 7.1.5** **A student shall register for all the subjects and earn all the 236 credits.** Marks obtained in all the credits shall be considered for the calculation of the class based on CCPA.
- 7.1.6** A student who fails to earn all the 236 credits as indicated in the course structure within **eight** academic years from the year of his admission shall forfeit his seat in B.Tech. Programme and his admission stands cancelled.

7.2 For Lateral Entry Students (batches admitted from 2012-2013):

- 7.2.1** Academic requirements for pass in a subject are the same as in 7.1.1 and attendance requirements as in 6.3.
- 7.2.2** A student shall be promoted from II year to III year if he fulfills the academic requirements of securing a minimum of **28** credits from II year I and II-Semesters examinations conducted till that time.
- 7.2.3** A student shall be promoted from III year to IV year if he fulfills the academic requirements of securing a minimum of 58 credits from II year I and II-Semesters and the III year I and II-Semester examinations conducted till that time.
- 7.2.4** A student shall register for all the subjects and earn all such credits. Marks obtained in all such credits shall be considered for the calculation of the class based on CCPA.
- 7.2.5** A student who fails to earn all the 180 credits as indicated in the course structure within **six** academic years from the year of his admission shall forfeit his seat in B.Tech. Programme and his admission stands cancelled.

8. TRANSITORY REGULATIONS:

Students who got detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester/year from the date of commencement of class work for the next batch or later batches with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch he is joining later.

9. CREDIT POINT AVERAGE (CPA) AND CUMULATIVE CREDIT POINT AVERAGE (CCPA):

9.1 For a semester/year:

$$\text{CREDIT POINT AVERAGE [CPA]} = \frac{1}{10} \frac{\sum_i C_i T_i}{\sum_i C_i}$$

Where C_i = Credits earned for Course i in any semester/ year,

T_i = Total marks obtained for course i in any semester/year,

9.2 For the entire programme:

CUMULATIVE CREDIT POINT AVERAGE [CCPA]

$$= \frac{1}{10} \frac{\sum_n \sum_i C_{ni} T_{ni}}{\sum_n \sum_i C_{ni}}$$

n -refers to the semester in which such courses were credited.

9.3 Overall Performance:

CCPA	Classification of final result
7.0 and above	First Class with distinction
6.0 and above but below 7.0	First class
5.0 and above but below 6.0	Second class
4.0 and above but below 5.0	Pass class

10. TRANSCRIPTS:

After successful completion of the entire programme of study, a transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued, if required, after payment of requisite fee. Partial transcript will also be issued up to any point of study to a student on request.

11. ELIGIBILITY:

A student shall be eligible for the award of B.Tech Degree if he fulfills all the following conditions:

- (i) Registered and successfully completed all the components prescribed in the programme of study to which he is admitted.
- (ii) Successfully acquired all **236 credits** as specified in the curriculum corresponding to the branch of study within the stipulated time.
- (iii) No disciplinary action is pending against him.

12. AWARD OF B.TECH DEGREE:

The B.Tech Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Anantapur on the recommendations of the Principal of Annamacharya Institute of Technology and Sciences (Autonomous).

13. AMENDMENTS TO REGULATIONS:

The chairman, Academic Council of Annamacharya Institute of Technology and Sciences, Rajampet (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

14. GENERAL:

Where the words "he", "him", "his", "himself" occur in the regulations, they include "she", "her", "herself".

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES	
Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2011
Department	Department of Computer Science and Engineering
Programme Code & Name	G1, B.Tech. CSE

I Year B.Tech

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1GC11	English	2	0	0	4	30	70	100
1GC12	Engineering Physics	2	0	0	4	30	70	100
1GC13	Engineering Chemistry	2	0	0	4	30	70	100
1GC14	Mathematics – I	3	1	0	6	30	70	100
1GC15	Mathematical Methods	2	1	0	4	30	70	100
1G111	Programming in C and Data Structures	4	1	0	8	30	70	100
1G513	Engineering Drawing	1	0	3	6	30	70	100
1GC16	Engineering Physics and Chemistry Lab	0	0	3	4	30	70	100
1GC17	English Language and Communication Skills Lab	0	0	3	4	30	70	100
1G113	Programming in C and Data Structures Lab	0	0	6	8	30	70	100
1G411	Engineering and IT workshop	0	0	3	4	30	70	100
Total		16	3	18	56	330	770	1100

Note: L - Lecture; T-Tutorial; P – Practical; C – Credits.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES	
Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2011
Department	Department of Computer Science and Engineering
Programme Code & Name	G1, B.Tech. CSE

II Year B.Tech I Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G131	Advanced Data Structures Through C++	4	0	0	4	30	70	100
1G132	Digital Logic Design	4	1	0	4	30	70	100
1G133	Mathematical Foundations of Computer Science	4	1	0	4	30	70	100
1GC33	Probability & Statistics	4	1	0	4	30	70	100
1G334	Electronic Devices and Circuits	4	1	0	4	30	70	100
1G235	Basic Electrical Engineering	4	0	0	4	30	70	100
1GC35	Soft Skills – I	2	0	0	2	30	70	100
1G23A	Electrical & Electronics Engineering lab	0	0	3	2	30	70	100
1G134	Advanced Data Structures Lab Through c++	0	0	3	2	30	70	100
Total		26	4	6	30	270	630	900

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2011
Department	Department of Computer Science and Engineering
Programme Code & Name	G1, B.Tech. CSE

II Year B.Tech II Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G141	Computer Organization	4	0	0	4	30	70	100
1G142	Database Management Systems	4	1	0	4	30	70	100
1G143	Design and Analysis of Algorithms	4	1	0	4	30	70	100
1G144	Formal Languages and Automata Theory	4	1	0	4	30	70	100
1G145	Object Oriented Programming Through JAVA	4	1	0	4	30	70	100
1GC43	Environmental Science	4	0	0	4	30	70	100
1G146	Seminar - I	0	0	2	2	100	00	100
1G147	Database Management Systems Lab	0	0	3	2	30	70	100
1G148	Object Oriented Programming Through JAVA Lab	0	0	3	2	30	70	100
Total		24	4	8	30	340	560	900

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2011
Department	Department of Computer Science and Engineering
Programme Code & Name	G1, B.Tech. CSE

III Year B.Tech I Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G151	Compiler Design	4	1	0	4	30	70	100
1G152	Computer Graphics	4	1	0	4	30	70	100
1G153	Computer Networks	4	1	0	4	30	70	100
1G154	Operating Systems	4	1	0	4	30	70	100
1G155	Principles of Programming Languages	4	0	0	4	30	70	100
1G355	Microprocessors and Interfacing	4	0	0	4	30	70	100
1GC53	Soft Skills – II	2	0	0	2	30	70	100
1G358	Microprocessors and Interfacing Lab	0	0	3	2	30	70	100
1G156	Computer Networks & Operating Systems Lab	0	0	3	2	30	70	100
Total		26	4	6	30	270	630	900

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2011
Department	Department of Computer Science and Engineering
Programme Code & Name	G1, B.Tech. CSE

III Year B.Tech II Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G161	Distributed Systems	4	1	0	4	30	70	100
1G162	Cryptography and Network Security	4	1	0	4	30	70	100
1G163	Linux Programming	4	1	0	4	30	70	100
1G164	Object Oriented Analysis and Design	4	1	0	4	30	70	100
1G165	Software Engineering	4	1	0	4	30	70	100
1GA61	Managerial Economics and Financial Analysis	4	0	0	4	30	70	100
1G166	Seminar - II	0	0	2	2	100	00	100
1GC61	Advanced English Communication Skills Lab	0	0	3	2	30	70	100
1G167	Linux Programming Lab	0	0	3	2	30	70	100
Total		24	5	8	30	340	560	900

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2011
Department	Department of Computer Science and Engineering
Programme Code & Name	G1, B.Tech. CSE

IV Year B.Tech I Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G171	Data Warehousing and Mining	4	1	0	4	30	70	100
1G172	Open Systems for Web technologies	4	1	0	4	30	70	100
1G173	Software Project management	4	1	0	4	30	70	100
1GA71	Management Science	4	1	0	4	30	70	100
ELECTIVE – I								
1G174	High Performance Computing	4	0	0	4	30	70	100
1G175	Advanced Computer Architecture							
1G374	Embedded Systems							
ELECTIVE – II								
1G176	Network Management Systems	4	0	0	4	30	70	100
1G177	Network Programming							
1G472	Mobile Communications							
1G178	Comprehensive Computer Science and Engineering	0	0	2	2	100	00	100
1G179	Case tools and Data Mining Lab	0	0	3	2	30	70	100
1G17A	Web Technologies Lab	0	0	3	2	30	70	100
Total		24	4	8	30	340	560	900

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2011
Department	Department of Computer Science and Engineering
Programme Code & Name	G1, B.Tech. CSE

IV Year B.Tech II Semester

Subject Code	Subject Name	Hours/Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G181	Artificial Neural Networks	4	0	0	4	30	70	100
1G182	Design Patterns	4	0	0	4	30	70	100
ELECTIVE –III								
1G388	VLSI Design	4	0	0	4	30	70	100
1G183	Image processing							
1G184	Virtual Reality							
ELECTIVE - IV								
1G185	Human Computer Interaction	4	0	0	4	30	70	100
1G186	Service Oriented Architecture							
1G187	Software Testing Methodologies							
1G188	Seminar - III	0	0	2	2	100	00	100
1G189	Project Work	0	0	12	12	30	70	100
Total		16	0	14	30	250	350	600

II Year B.Tech. CSE-I Semester

**(1G131) ADVANCED DATA STRUCTURES THROUGH C++
(Common to CSE and IT)**

UNIT I C++ CLASS OVERVIEW- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

UNIT II Function over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

UNIT III Algorithms, performance analysis- time complexity and space complexity. Review of basic data structures-The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++.

UNIT IV Dictionaries, linear list representation, hash table representation, hash functions, collision resolution- separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, and comparison of hashing.

UNIT V PRIORITY QUEUES – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

UNIT VI Binary tree, Binary Tree Traversal. Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching

UNIT VII Introduction to Red–Black and Splay Trees, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees

UNIT VIII PATTERN MATCHING AND TRIES: Pattern matching algorithms-Brute force, the Boyer –Moore algorithm, Standard Tries, Compressed Tries, and Suffix tries.

TEXT BOOKS:

1. A. Ananda Rao, and P. RadhikaRaju, *Data structures and Algorithms using C++*. Pearson edition.
2. S.Sahni, *Data structures, Algorithms and Applications in C++*. University Press (India) Pvt. Ltd, Universities Press Orient Longman Pvt. Ltd, 2nd Ed.
3. Michael T. Goodrich, R. Tamassia and Mount, *Data structures and Algorithms in C++*. Wiley student edition, John Wiley and Sons.

REFERENCE BOOKS:

1. Mark Allen Weiss, *Data structures and Algorithm Analysis in C++*. Pearson Education Ltd., 2nd Ed.
2. Langsam, Augenstein and Tanenbaum, *Data structures using C and C++*. PHI.
3. W. Savitch, *Problem solving with C++*, The OOP. Pearson education, 4th Ed.

II Year B.Tech. CSE-I Semester

(1G132) DIGITAL LOGIC DESIGN

UNIT I DIGITAL CONCEPTS AND NUMBER SYSTEMS: Digital and Analog: History of Digital Systems, Digital Systems overview, Introduction to Number systems: Types of Number systems, Number System conversions, Binary codes, Binary Arithmetic.

UNIT II BOOLEAN SWITCHING ALGEBRA: Introduction, Binary Logic Functions, Switching Algebra, Functionally complete operation sets, Reduction of switching equations using Boolean algebra, Realization of Switching Functions.

UNIT III COMBINATIONAL CIRCUITS-I:
Principles Of Combinational Logic: Introduction, Definition of combinational logic, Canonical forms, Generation of switching equations from truth tables, Karnaugh maps, Mixed logic combinational circuits, Map entered variables, Multiple output functions.

UNIT IV COMBINATIONAL CIRCUITS-II:
Analysis And Design Of Combinational Logic: Combinational Circuits, Analysis procedure, Design procedure, Binary Adder-Subtractor, Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers.

UNIT V STORAGE ELEMENTS, COUNTERS AND REGISTERS:
Storage elements: latches, Flip-Flops; counters: Ripple counters, synchronous counters, Ring and Johnson counters; Registers: Introduction to shift registers.

UNIT VI SEQUENTIAL CIRCUITS-I (SYNCHRONOUS):
Analysis of Sequential Circuits: Introduction, Mealy and Moore models, State machine notations, Synchronous Sequential Circuit Analysis, Construction of State diagrams.

Design of Sequential Circuits: State Equivalence, State reduction, State Reduction of Incompletely Specified State Tables, State Assignment technics.

UNIT VII SEQUENTIAL CIRCUITS-II (ASYNCHRONOUS):
Introduction to Asynchronous Sequential Circuits, Fundamental and Pulse Mode asynchronous sequential circuits, Analysis, deriving Flow tables, State assignment, Design Problems.

UNIT VIII PROGRAMMABLE LOGIC AND MEMORY: Memory, Programmable Logic devices: Programmable Logic Array and Programmable Array Logic. Introduction to HDL, HDL for various logic circuits.

TEXT BOOKS:

1. John M. Yarbrough, *Digital Logic applications and design*. cengage Learning, India Edition.
2. M.Morris Mano, *Digital Design*. Pearson Education/PHI, 4th Ed.

REFERENCE BOOKS:

1. B. Marcovitz, *Introduction to Logic Design –ALAN*. Tata McGraw Hill, 2nd Ed.
2. C.V.S. Rao, *Switching and Logic Design*. Pearson Education.
3. Donald D. Givone, *Digital Principles and Design*. Tata McGraw Hill.
4. M. Rafiquzzaman, *Fundamentals of Digital Logic & Micro Computer Design*. John Wiley, 5th Ed.

II Year B.Tech. CSE-I Semester

**(1G133) MATHEMATICAL FOUNDATIONS OF
COMPUTER SCIENCE
(Common to CSE and IT)**

UNIT I MATHEMATICAL LOGIC: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms.

UNIT II PREDICATES: Quantifiers and universal quantifiers. Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT III RELATIONS: Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function Comports of functions, recursive Functions, Lattice and its Properties.

UNIT IV ALGEBRAIC STRUCTURES: Algebraic systems Examples and general properties, Semi groups and monoids, groups sub groups, homomorphism, Isomorphism.

UNIT V ELEMENTARY COMBINATORIES: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion and Exclusion. Pigeon hole principles and its application

UNIT VI RECURRENCE RELATION: Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics roots solution of in homogeneous Recurrence Relation.

UNIT VII GRAPH THEORY: Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs

UNIT VIII Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

TEXT BOOKS:

1. J.P.Trembl, R.Manohar, *Discrete Mathematical Structures with Applications to Computer Science*.TMH.

REFERENCE BOOKS:

1. Thomas Koshy, *Discrete Mathematics with Applications*. Elsevier.
2. Bernand Kolman, Roberty C. Busby, Sharn Cutter Ross, *Discrete Mathematical Structures*. Pearson Education/PHI.
3. Malik & Sen, *Discrete Mathematical structures Theory and application*.
4. Garry Haggard and others, *Discrete Mathematics for Computer science*, Thomson.

II Year B.Tech. CSE-I Semester

(1GC33) PROBABILITY AND STATISTICS

UNIT I STATISTICS: Introduction – Mean, Median, Mode, Range and Standard Deviation (ungrouped data) – Correlation – Rank correlation.

UNIT II PROBABILITY: Sample space and events – Probability – The axioms of probability – Some Elementary theorems - Conditional probability – Baye's theorem.

UNIT III Random variables – Discrete and continuous – Distribution functions - mean and variance.

UNIT IV Binomial distribution –Poisson distribution- Uniform distribution (Discrete) - Normal distribution.

UNIT V SAMPLING DISTRIBUTION: Population and sample - Sampling distributions of means (σ known and unknown) & proportions.

UNIT VI ESTIMATION: Point estimation – interval estimation - one mean – two means (large sample) and one proportion – two proportions (large sample).

UNIT VII Test of Hypothesis – Hypothesis concerning one and two means– large and small samples

UNIT VIII Tests of significance – one proportion (large sample) – two proportions – several proportions – rxc contingency tables – goodness of fit.

TEXT BOOKS:

1. S C Gupta and V K Kapoor, *Fundamentals of Mathematical Statistics*. Schand & sons.
2. B. V. Ramana, *A text book of Probability & Statistics*. Tata McGraw Hill.

REFERENCE BOOKS:

1. Erwin Kreyszig, *Advanced Engineering Mathematics*. New Age International (Pvt) Limited, 8th Ed.
2. T. K. V. Iyengar, B. Krishna Gandhi and Others, *Probability & Statistics*. S.Chand & Company.
3. Miller and John E. Freund, *Probability & Statistics for Engineers*. Prentice Hall of India.

II Year B.Tech. CSE-I Semester

**(1G334) ELECTRONIC DEVICES AND CIRCUITS
(Common to CSE and IT)**

UNIT I SEMICONDUCTOR DIODES: Insulators, conductors and semiconductors – Semiconductor Types – Semiconductor Diode – Ideal Diode – Characteristics of PN Junction Diode and Temperature Dependency – Drift and Diffusion Currents – Breakdown mechanisms in semiconductor diodes – Zener diode and its characteristics, Light Emitting Diodes, Photo Diodes.

UNIT II DIODE APPLICATIONS: Introduction – Load Line Analysis – Rectifier Circuits: Half Wave and Full Wave Rectifiers –L Filter - Capacitor Filter – RC Filter – Zener diode as a Regulator.

UNIT III BIPOLAR JUNCTION TRANSISTORS: Transistor Construction – Transistor Operation – BJT Characteristics – Transistor Amplifying Action – Load Line – Operating Point – CB, CE and CC Configurations.

UNIT IV BIASING AND BIAS STABILITY: Introduction – Fixed Bias – Emitter Bias – Voltage Divider Bias – Bias Stabilization: Need for Stabilization – Thermal Stability and Thermal Runaway – Heat Sinks.

UNIT V FIELD EFFECT TRANSISTORS: Construction and operation of JFETs – Drain and Transfer Characteristics, Comparison between BJT and JFET, Construction and Characteristics of MOSFETs – Depletion type MOSFETs – Enhancement type MOSFETs.

UNIT VI AMPLIFIERS: Classification of amplifiers - Small Signal model of BJT – h-parameter model of BJT – CB, CE and CC configurations using h-parameters. Power amplifiers – Class A, Class B, Push-pull, Complimentary symmetry.

UNIT VII FEEDBACK AMPLIFIERS: Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of feedback on input and output characteristics on voltage series, voltage shunt, current series and current shunt feedback amplifiers.

UNIT VIII OSCILLATORS: Condition for oscillations, RC phase shift oscillator, Hartley and Colpitts oscillator, Wien bridge oscillator, crystal oscillators.

TEXT BOOKS:

1. Rober Boylestad and Louis Nashelsky, *Electronic Devices and Circuit Theory*. PHI, 9th Ed.
2. J. Millman and Halkias, *Electronic Devices and Circuits*. TMH, 2008, 1991 edition.

REFERENCE BOOKS:

1. J. Millman and Halkias, *Integrated Electronics, Analog and Digital Circuits and Systems*, TMH.
2. David A Bell, *Electronic Devices and Circuits*, Oxford University Press, 2008, 5th Ed.
3. R S Sedha, *Electronic devices and circuits*, S.Chand Publications.

II Year B.Tech. CSE-I Semester

**(1G235) BASIC ELECTRICAL ENGINEERING
(Common to CSE and IT)**

UNIT I INTRODUCTION TO ELECTRICAL ENGINEERING: Essence of electricity - Basic circuit components - Basic definitions: Electric field - Electric Current - Potential and potential difference – EMF - electric power - Ohm's law - resistive networks - Inductive networks - capacitive networks - series parallel circuits - star delta and delta star transformation.

UNIT II NETWORK ANALYSIS: Basic definitions: Node – Path – Loop - Branch - Kirchoff's laws- Nodal analysis– Mesh analysis- Source Transformation Technique.

Network Theorems: Superposition -Thevenin's - Maximum Power Transfer Theorems.

UNIT III ALTERNATING QUANTITIES: Principle of AC voltages - wave forms and basic definitions - RMS and average values of alternating currents and voltage - form factor and Peak factor - phasor representation of alternating quantities - the J operator and phasor algebra - analysis of AC circuits with single basic network element - single phase series and parallel RLC circuits - power factor.

UNIT IV THREE PHASE CIRCUITS: Introduction – three phase systems – advantages – star and delta connection – voltages and currents in balanced star and delta connections – advantages of star and delta connections.

UNIT V DC MACHINES: Constructional details of a DC machine - principle of operation of a DC generator - types of DC generators - emf equation of a generator – Applications. DC motors - Principle of operation - types of DC motors - Torque equation - losses and efficiency-Applications.

UNIT VI AC MACHINES-I: Transformers - principle of operation - constructional details - losses and efficiency - regulation of transformer - testing of Transformers: OC and SC test.

UNIT VII AC MACHINES-II: Three phase Induction motors: Constructional details- principle of operation – slip - rotor frequency Torque equation-Torque Vs Slip Characteristics. Synchronous generator Constructional details- principle of operation EMF equation –Regulation by EMF method.

UNIT VIII BASIC MEASURING INSTRUMENTS: Introduction - classification of instruments - operating principles - essential features of measuring instruments - moving coil permanent magnet (PMMC) and moving iron instruments(voltmeters and ammeters)- Digital multimeters

TEXT BOOKS:

1. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering*, Oxford University press,,2009.
2. B.L. Theraja & A.K. Theraja, *A text book of electrical technology in SI units*, Vol: 2, 2010.

REFERENCE BOOKS:

1. D.P. Kothari and I. J. Nagrath, *Theory and problems of Basic Electrical Engineering*. Prentice Hall of India, 2009.
2. V.K. Mehta, Rohit Mehta, *Principles of electrical engineering*, S. Chand & Company Ltd., 2006
3. V.K. Mehta, Rohit Mehta, *Principles of power systems*, S.Chand & Company Ltd., 2006.
4. M.S. Naidu and S. Kamakshaiah, *Basic Electrical Engineering*, Tata McGraw Hill Publications Ltd, 2009.

II Year B.Tech. CSE-I Semester

(1GC35) SOFT SKILLS - I

(Common to CSE and ME)

APTITUDE AND REASONING SKILLS

QUANTITATIVE APTITUDE:

- Number Systems, Averages, Problems on ages, Allegations, Percentages, Profit and Loss, Simple interest and Compound Interest, Ratio and Proportions and Variation, Time and Work, Time and Distance, Mensuration, Functions, Set Theory, Permutation and Combinations, Probability, Progressions, Inequalities, Coordinate Geometry, Quadratic Equations, Logarithms.
- HCF and LCM, Decimal Fractions, Simplification, Square Roots and Cube Roots, Surds and Indices, Pipes and cisterns, Area, Volume and Surface Areas, Races and Games, Calendar, Clocks, Stocks and Shares, True Discount, Banker's Discounts.
- Data Interpretation, Tabulation, Bar Graphs, Pie Charts, Line Graphs.

REASONING:

- Directions, Blood Relations, Problems on cubes, Series and sequences, odd man out, Coding and decoding, Data Sufficiency, logical deductions, Arrangements and Combinations, Groups and Teams, General Mental Ability, Puzzles to puzzle you, More Puzzles, Brain Teasers, Puzzles and Teasers.

REFERENCE BOOKS:

1. Arun Sharma, *How to Prepare for Quantitative Aptitude*. TMH Publishers, New Delhi, 2003.
2. R.S. Agarwal, *Quantitative Aptitude*. S.Chand Publishers, New Delhi, 2005.
3. Sharon Weiner-Green, Ira K. Wolf, *Barron's GRE*. Galgotia Publications, New Delhi, 2006.
4. R.S. Agarwal, *Verbal and Non-Verbal Reasoning*. S.Chand Publishers, New Delhi, 1998.
5. Shakuntala Devi, *Puzzles to Puzzle You*. Orient Paper Backs Publishers (OPB), New Delhi, 2005.
6. Shakuntala Devi, *More Puzzles*. OPB, New Delhi, 2006.
7. Ravi Narula, *Brain Teasers*. Jaico Publishing House, New Delhi, 2005.
8. George J Summers, *Puzzles and Teasers*. Jaico Publishing House, Mumbai, 2005.

II Year B.Tech. CSE-I Semester

**(1G23A) ELECTRICAL AND ELECTRONICS ENGINEERING LAB
(Common to CSE and IT)**

Any ten Experiments to be conducted.

ELECTRICAL LAB

1. Verification of superposition theorem.
2. Verification of the venin's theorem.
3. Open circuit characteristics of DC shunt generator.
4. Swinburne's test on DC shunt machine.(Predetermination of efficiency of a given DC shunt machine working as motor and generator)
5. Brake test on DC shunt motor. Determination of performance characteristics.
6. OC and SC tests on single phase transformer.(Predetermination of efficiency and regulation at given power factors)

ELECTRONICS LAB

1. Identification, specifications and testing of R,L,C components (colour codes), potentiometers, switches (SPDT, DPDT & DIP), coils, gang condensers, relays, breadboards, identification and specifications of active devices, diodes, BJTs, lowpowerJFETs, MOSFETs, LEDs, LCDs, SCR, UJTs, linear and digital ICs.
2. PN junction diode characteristics (forward bias, reverse bias).
3. Zener diode characteristics and Zener as regulator.
4. Transistor CE characteristics (input and output).
5. Rectifier without filters (full wave and half wave).
6. Rectifier with filters (full wave and half wave).

II Year B.Tech. CSE-I Semester

**(1G134) ADVANCED DATA STRUCTURES LAB THROUGH C++
(Common to CSE and IT)**

- Week1:** C++ programs to implement the following using an array.
a) Stack ADT b) Queue ADT
- Week2:** Write C++ programs to implement the following using a singly linked list:
a) Stack ADT b) Queue ADT
- Week3:** Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.
- Week 4:** Write a C++ program to perform the following operations:
a) Insert an element into a binary search tree.
b) Delete an element from a binary search tree.
c) Search for a key element in a binary search tree.
- Week5:** Write C++ programs that use non-recursive functions to traverse the given binary tree in
a) Preorder b) inorder and c) postorder.
- Week6:** Write C++ programs for the implementation of bfs and dfs for a given graph.
- Week7:** Write C++ programs for implementing the following sorting methods:
a) Merge sort b) Heap sort
- Week8:** Write a C++ program to perform the following operations
a) Insertion into a B-tree b) Deletion from a B-tree
- Week9:** Write a C++ program to perform the following operations
a) Insertion into an AVL-tree b) Deletion from an AVL-tree
- Week10:** Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

(Note: Use Class Templates in the above Programs)

TEXT BOOKS :

1. Adam Drozdek, *Thomson. Data Structures and Algorithms in C++*. 2007-2008, 3rd Ed. Page 36 of 95.
2. D.S. Malik, *Data Structures using C++*. Thomson.

II Year B.Tech. CSE-II Semester

(1G141) COMPUTER ORGANIZATION

UNIT I DIGITAL COMPUTERS: Digital computers, Logic gates, Boolean Algebra, Map simplification, Combinational Circuits, Data Representation. Data Types, Complements, Fixed Point Representation. Floating – Point Representation. Error Detection codes.

UNIT II REGISTER TRANSFER LANGUAGE AND MICRO OPERATIONS: Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle.

Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

UNIT III MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit Hard wired control. Micro programmed control

UNIT IV COMPUTER ARITHMETIC: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit Decimal Arithmetic operations.

UNIT V MEMORY ORGANIZATION: Memory hierarchy, main memory, Auxiliary Memory, Cache Memory, Virtual Memory, Memory Management Hardware.

UNIT VI INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP) Serial communication; Introduction to peripheral component, Interconnect (PCI) bus.

UNIT VII PIPELINE AND VECTOR PROCESSING: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors.

UNIT VIII MULTI PROCESSORS: Characteristics of Multiprocessors, Interconnection Structures, Inter processor Arbitration. Inter Processor Communication and Synchronization

TEXT BOOKS:

1. M.Moris Mano, *Computer Systems Architecture*. Pearson/PHI, 3rd Ed.

REFERENCE BOOKS:

1. William Stallings, *Computer Organization and Architecture*. Pearson/PHI, 6th Ed.
2. Carl Hamacher, ZvonksVranesic, SafeaZaky, *Computer Organization*. McGraw Hill, 5th Ed.
3. Andrew S. Tanenbaum, *Structured Computer Organization*. PHI/Pearson, 4th Ed.
4. Sivaraama Dandamudi, *Fundamentals or Computer Organization and Design*. Springer Int. Edition.

II Year B.Tech. CSE-II Semester

**(1G142) DATA BASE MANAGEMENT SYSTEMS
(Common to CSE and IT)**

UNIT I INTRODUCTION: History of Data base Systems, introduction to DBMS. Data base System Applications, data base System VS file System – View of Data – Data Abstraction –Instances and Schemas – Introduction to data Models - the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Applications and architectures.

UNIT II DATABASE DESIGN: Introduction to Data base design and ER diagrams – Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Conceptual Design with the ER Model – Conceptual Design for Large enterprises. ERD case Studies

UNIT III THE RELATIONAL MODEL: Introduction to the Relational Model– Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying or altering Tables and Views.

UNIT IV SQL AND PL/SQL: Introduction to SQL-data definition commands-data manipulation commands-select queries virtual tables: creating a view-updatable view-destroying view. Relational set operators- SQL join operators-sub queries and correlated queries-Aggregation functions-Procedural SQL- procedures, functions, cursors, triggers.

UNIT V SCHEMA REFINEMENT AND NORMAL FORMS: Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about Functional Dependencies – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form. Improving the design - surrogate key considerations-higher level normal forms-normalization and database design-De-normalization.

UNIT VI TRANSACTIONS MANAGEMENT: Overview of transaction management: ACID properties- Implementation of Atomicity and Durability - concurrent execution of transaction-Serializability-Implementation of Isolation - transaction support in SQL

UNIT VII CONCURRENCY CONTROL AND RECOVERY SYSTEM: Concurrency Control-Lock Based Protocols, Time-stamp Based protocol-Validation based Protocols, Multiple Granularities And Dead Lock handling
Recovery Systems: Failures Classification-Storage Structure Structure-Recovery and atomicity –log Based Recovery-Recovery with Concurrent Transactions-buffer Management

UNIT VIII OVER VIEW OF STORAGE AND INDEXING: Overview of Storage and Indexing: data on external storage-file organization and indexing-index data structures-Compression of File organizations. Tree –Structured indexing -Intuitions for tree indexes-Indexed sequential access-methods (ISAM) - B+trees.

TEXT BOOKS:

1. Raghurama Krishnan, JohannesGehrke, *Data base Management Systems*. Tata McGrawHill.
2. Peter Rob, AnandaRao and Carlos Corone, *Database Management Systems*. Cengage Learning.

REFERENCE BOOKS:

1. Silberschatz, Korth, *Database system Concepts*. McGrawhill, 5th Edition.
2. Elmasri, Navate, *Fundamentals of Database Systems*. Pearson Education.
3. C. J. Date, *Introduction to Database Systems*. Pearson Education.

II Year B.Tech. CSE-II Semester

**(1G143) DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE and IT)**

UNIT I INTRODUCTION: Algorithm, Pseudo Code for algorithms, performance analysis-Space complexity, Time Complexity, Asymptotic Notation- Big Oh Notation , Omega Notation, Theta notation and Little Oh notation, Amortized complexity, Sets-Disjoint set operations, Union and Find algorithms.

UNIT II DIVIDE AND CONQUER: General Method, applications- Binary Search, Quick sort, Merge Sort, Strassen's Matrix multiplication.

UNIT III GREEDY METHOD: General Method, applications-Job sequencing with dead-lines, knapsack problem, Minimum-cost Spanning trees, Single source shortest path.

UNIT IV DYNAMIC PROGRAMMING: General Method, applications- Matrix Chain multiplication, Optimal Binary search trees, 0/1 Knapsack, All pairs shortest path, The Travelling person problem, Reliability design.

UNIT V BACKTRACKING: General Method, applications - 8- queen problem, sum of subsets, graph coloring, Hamiltonian cycles.

UNIT VI BASIC TRAVERSAL AND SEARCH TECHNIQUES: Techniques for binary trees, Techniques for Graphs, Breadth first Search and Traversal, Depth First search and traversal, connected components and spanning trees, bi-connected components and DFS.

UNIT VII BRANCH AND BOUND: General Method, applications-Travelling Sales Person (*), and 0/1 knapsack problem-LC Branch and Bound Solution, FIFO Branch and Bound solution.

UNIT VIII NP-HARD AND NP-COMPLETE PROBLEMS: Basic Concepts, nondeterministic algorithms, The classes-NP-Hard and NP Complete, Cook's Theorem (*).

TEXT BOOKS:

1. Ellis Horowitz, Sartaj Sahni and Rajasekharam, *Fundamentals of Computer Algorithms*. Galgotia publications Pvt. Ltd.
2. Parag Himanshu Dave, Himanshu Bhalchandra Dave, *Design and Analysis Algorithms*. Pearson.
3. M.T. Goodrich and R.Tomassia, *Algorithm Design: Foundations, Analysis and Internet Example*. John Wiley and sons.

REFERENCE BOOKS:

1. R.C.T.Lee, S.S .Tseng, R.C.Chang and T.Tsai, *Introduction to Design and analysis of Algorithms,A strategic approach*. McGraw Hill.
2. Aho,Ullman and Hopcroft, *Design and Analysis of algorithms*. Pearson Education.

II Year B.Tech. CSE-II Semester

(1G144) FORMAL LANGUAGES AND AUTOMATA THEORY

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

UNIT II FINITE AUTOMATA: NFA with ϵ transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without ϵ transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.

UNIT III REGULAR LANGUAGES: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets

UNIT IV GRAMMAR FORMALISM: Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.

UNIT V CONTEXT FREE GRAMMARS: Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL.

UNIT VI PUSH DOWN AUTOMATA: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, inter conversion. Introduction to DCFL and DPDA.

UNIT VII TURING MACHINE: Turing Machine, definition, model, design of TM, Computable functions, recursively Enumerable languages. Church's hypothesis, counter machine, types of Turing machines

UNIT VIII COMPUTABILITY THEORY: linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts. Correspondence problem, Turing

reducibility,

TEXT BOOKS:

1. KVN Sunitha, *Theory of computations*. Pearson Edition.
2. Hopcroft H.E. and Ullman J. D., *Introduction to Automata Theory Languages and Computation*. Pearson Education.
3. Sipser, *Introduction to Theory of Computation*. Thomson, 2nd Ed.

REFERENCE BOOKS:

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

II Year B.Tech. CSE-II Semester

**(1G145) OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to CSE and IT)**

UNIT I OBJECT ORIENTED THINKING: Need for OOP paradigm summary of Object Oriented Programming concepts. History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, Review of control statements, type conversion and costing, simple java program, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT II INHERITANCE: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

UNIT III PACKAGES AND INTERFACES: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT IV EXCEPTION HANDLING AND MULTITHREADING: Concepts of exception handling, benefits of exception handling, Termination or presumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

UNIT V EVENT HANDLING: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, and inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, dialogs, menubar, graphics,

UNIT VI APPLET & LAYOUT MANAGERS: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets. Layout manager - layout manager types –border, grid, flow, card and grid bag.

UNIT VII SWING: Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing-JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Checkboxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables

UNIT VIII NETWORKING: Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients, Java .net package Packages – java.util,

TEXT BOOKS:

1. Herbert schildt, *Java - The complete reference*, TMH, 7th Ed.
2. T.Budd, *Understanding OOP with Java*, Pearson education.2007-2008, updated edition. Page 47 of 95.

REFERENCE BOOKS:

1. J.Nino and F.A. Hosch, *An Introduction to programming and OO design using Java*, John Wiley & sons.
2. Y. Daniel Liang, *Introduction to Java programming*. Pearson education, 6th Ed.
3. R.A.Johnson, *An introduction to Java programming and object oriented application development*. Thomson.
4. Cay.S.Horstmann and Gary,Cornell, *Core Java 2, Vol-1, Fundamentals*, Pearson Education, 7th Ed.
5. Cay.S.Horstmann and GaryCornell *Core Java 2, Vol 2, Advanced Features*, Pearson Education, 7th Ed.
6. P. Radha Krishna, *Object Oriented Programming through Java*. University Press.

II Year B.Tech. CSE-II Semester

**(1GC43) ENVIRONMENTAL SCIENCE
(Common to CSE and ME)**

UNIT I THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES: Definition, multidisciplinary nature, Scope & Importance- Need for public awareness -Global environmental crisis-People in Environment – Institutions in Environment.

UNIT II FOREST, WATER AND ENERGY RESOURCES:

Natural resources: definition. Renewable & non-renewable natural resources. Natural resources & their associated problems.

Forest resources: Use & over –exploitation- deforestation, case studies- Timber extraction –Mining-dams & their effects on forest & tribal people.

Water resources: Use and over utilization of surface and ground water -floods, drought- conflicts over water, dams – benefits & problems.

Energy resources: Growing energy needs- renewable and non – renewable energy resources- use of alternate energy resources, case studies.

UNIT III MINERAL, FOOD & LAND RESOURCES:

Mineral resources: Use and exploitation, environmental effects of extracting & using mineral resources, case studies.

Food resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizer – pesticide problems, water – logging, salinity, case studies.

Land resources: Land as a resource, land degradation, man – induced landslides, soil erosion and desertification.

- Role of an individual in the conservation of natural resources.
- Equitable use of resources for sustainable life styles.

UNIT IV ENVIRONMENTAL POLLUTION:

Definition, causes, effects & control measures of: Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, Marine pollution, Nuclear hazards - Pollution case studies- Role of an individual in prevention of pollution.

Solid waste management: Causes, effects and control measures of urban and industrial wastes.

Disaster management: floods, drought, earthquake, cyclone and landslides.

UNIT V ECOSYSTEMS: Concept of an ecosystem. Structure and functions of an ecosystem-Producers, consumers & decomposers - Food chains, food webs & ecological pyramids - Energy flow in the ecosystem - Cycling of nutrients (Bio geo chemical cycles) - Energy production - Ecosystem development & regulation -Ecological succession. Introduction, types, characteristic features, structure and functions of the following ecosystem: (a) Forest ecosystem (b) Grass land ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT VI BIODIVERSITY AND ITS CONSERVATION: Introduction, Definition: genetic, species and ecosystem diversity.

Value of biodiversity: consumptive value, productive value, social value, ethical value, aesthetic value & option values - Bio-geographical classification of India - Biodiversity at global, national and local levels - India as a mega – diversity nation - Hot spots of biodiversity.

Threats to biodiversity: habitat loss, poaching of wild life, man-wild life conflicts - Endangered and endemic species of India.

Conservation of biodiversity: In-situ & Ex-situ conservation

UNIT VII SOCIAL ISSUES AND THE ENVIRONMENT: From Unsustainable to Sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people; its problems & concerns, case studies.

Environmental Ethics: Issues & possible solutions-Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents & holocaust, case studies - Wasteland reclamation - Consumerism & waste products - Environment protection Act - Air (Prevention & Control of Pollution) Act.-Water (Prevention & Control of Pollution) Act.-Wildlife Protection Act-Forest Conservation Act-Issues involved in enforcement of environmental legislation-Public awareness.

UNIT VIII HUMAN POPULATION & ENVIRONMENT: Population growth, variation among nations. Population explosion – Family Welfare Program - Environment & human health-Human Rights-Value Education - HIV/AIDS-Women & Child Welfare-Role of Information Technology in Environment and human health-Case studies.

TEXT BOOKS:

1. Erach Bharucha, *Text book of Environmental Studies for Undergraduate Courses*. University press.
2. R. Rajagopalan, *Environmental Studies*. Oxford University Press.
3. Anubha Kaushik and C. P. Kaushik, *Perspectives in Environmental Studies*. New Age International Publishers.

REFERENCE BOOKS:

1. J. P. Sharma, *Comprehensive Environmental Studies*. Laxmi Publications.
2. Anindita Basak, *Environmental Studies*. Pearson education.
3. Benny Joseph, *Environmental Studies*. Mc. Graw Hill Publications.

II Year B.Tech. CSE-II Semester

(1G147) DATABASE MANAGEMENT SYSTEMS LAB (Common to CSE and IT)

Objective: This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database.

The student is expected to practice the designing, developing and querying a database in the context of example database.

1. Creating tables for various relations using DDL commands in SQL(CREATE,ALTER,DELETE,DROP,DESCRIBE).
2. Implementation of DML commands (INSERT, SELECT, UPDATE, DELETE, TRUNCATE) in SQL.
3. Implementation of Aggregate operators in SQL (SUM, COUNT, AVG, MIN, MAX).
4. Implementation of Special operators in SQL (IS NULL, BETWEEN, LIKE, IN, EXISTS)
5. Implementation of Relational set operators in SQL (UNION, UNION ALL, INTERSECT, MINUS, CROSS JOIN,NATURAL JOIN)
6. Implementation of JOIN operators(Conditional Join, EQUIjoin,Left outer join,right outer join, Full outer join)
7. Implementation of Oracle Functions.
8. Creating Views, Updatable views, Destroying/Altering Views.
9. Creation of procedures and Functions.
10. Creation of Triggers and Cursors
11. Writing sample programs in PL/SQL.
12. Developing ER diagrams for Applications.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, *Data base Management Systems*. TataMcGrawHill.
2. Peter Rob, Ananda Rao and Carlos Corone. *Database Management Systems*. Cengage Learning.
3. Rick F.VanderLans, *Introduction to SQL*. Pearson Education.
4. B.RosenZweig and E.Silvestrova, *Oracle PL/SQL*. Pearson Education.
5. Steven Feuerstein.*Oracle PL/SQL Programming*.
6. Dr. P. S. Deshpande, *SQL & PL/SQL for Oracle 10g*. Black Book, DreamTech.
7. J. J. Patrick, *SQL fundamentals*. Pearson Education.

II Year B.Tech. CSE-II Semester

**(1G148) OBJECT ORIENTED PROGRAMMING
THROUGH JAVA LAB
(Common to CSE and IT)**

Objectives:

- To make the student learn an object oriented way of solving problems.
- To teach the student to write programs in Java to solve the problems

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space
- JDK Kit. Recommended

Week1 :

a) Write a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

b) The Fibonacci sequence is defined by the following rule:

The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

Week 2 :

a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

b) Write a Java program to multiply two given matrices.

c) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)

Week 3 :

a) Write a Java program that checks whether a given string is a palindrome or not.
Ex: MADAM is a palindrome.

b) Write a Java program for sorting a given list of names in ascending order.

c) Write a Java program to make frequency count of words in a given text.

Week 4:

a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.

b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

c) Write a Java program that displays the number of characters, lines and words in a text file.

Week 5 :

- a) Write a Java program that:
- i) Implements stack ADT.
 - ii) Converts infix expression into Postfix form
 - iii) Evaluates the postfix expression

Week 6 :

- a) Develop an applet that displays a simple message.
- b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.

Week 7 :

Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.

Week 8 : Write a Java program for handling mouse events.

Week 9 :

- a) Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.
- b) Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

Week 10 :

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the textfields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an ArithmeticException Display the exception in a message dialog box.

Week 11:

Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle. (Use java.net)

Week 12:

- a) Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program starts.
- b) Write a Java program that allows the user to draw lines, rectangles and ovals.

Week 13:

- a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides(). Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method numberOfSides () that shows the number of sides in the given geometrical figures.
- b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using JTable component.

TEXT BOOKS:

1. H. M. Dietel and P.J.Dietel, *Java How to Program*. Pearson Education/PHI, 6th Ed.
2. Y. Daniel Liang, *Introduction to Java programming*. Pearson Education, 6th Ed.
3. Cay Horstmann, *Big Java*, Wiley Student Edition, Wiley India Private Limited, 2nd Ed.

III Year B.Tech. CSE-I Semester

(1G151) COMPILER DESIGN

UNIT I OVERVIEW OF COMPILATION: Phases of Compilation – Lexical Analysis, Revisiting- Regular Grammar and regular expression for common programming language features pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

UNIT II TOP DOWN PARSING: Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

UNIT III BOTTOM UP PARSING: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC – automatic parser generator.

UNIT IV SEMANTIC ANALYSIS: Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker.

UNIT V SYMBOL TABLES: Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non block structure storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

UNIT VI CODE OPTIMIZATION: Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

UNIT VII DATA FLOW ANALYSIS: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

UNIT VIII OBJECT CODE GENERATION: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

TEXT BOOKS:

1. A.V. Aho, J. D. Ullman, Ravi Sethi, *Principles of compiler design*. Pearson

Education.

2. Andrew N. Appel, *Modern Compiler Implementation in C*. Cambridge University Press.

REFERENCE BOOKS:

1. Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, *Modern Compiler Design*. Wiley Dreamtech.
2. Cooper and Linda, *Engineering a Compiler*. Elsevier.
3. Loudon, *Compiler Construction*, Thomson.

III Year B.Tech. CSE-I Semester

(1G152) COMPUTER GRAPHICS

UNIT I INTRODUCTION: Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices
Conceptual frame work for Interactive Graphics, Drawing with SRGP, Basic Interaction Handling, Raster Graphics Features, Limitations of SRGP. (pp 22-90 of text book-1, ref book -1).

UNIT II OUTPUT PRIMITIVES : Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms (p.nos 103-123,137-145,147-150,164-171 of text book-1). Generating Characters, SRGP_Copy Pixel, Antialiasing (p.nos 151-164 of ref book-1).

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

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

UNIT V 3-D OBJECT REPRESENTATION: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods. (p.nos 324-331,335-342, 347-364, 516-531, 542-546 of text book-1).

UNIT VI 3-D GEOMETRIC TRANSFORMATIONS: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

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

UNIT VII VISIBLE SURFACE DETECTION METHODS: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods (p.nos 489-505 of text book -1, Chapter 15 of ref book-1).

UNIT VIII COMPUTER ANIMATION: Design of animation sequence,

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

TEXT BOOKS:

1. Donald Hearn and M.Pauine Baker, *Computer Graphics C version*. Pearson Education.

REFERENCE BOOKS:

1. James D.Foley, Andries Van Dam, Steven K.Feiner, Jhon F.Hughes, *Computer graphics principles and practice in c*. Pearson education, 2nd Ed.
2. Zhigandxiang, ROY Plastock, *Computer Graphics*, Schaum's outlines, TataMcGraw Hill, 2nd Ed.
3. Neuman and Sproul, *Principles of interactive Computer graphics*. TMH.
4. David F Rogers, *Procedural elements for Computer Graphics*, Tata Mc Graw hill, 2nd Ed.
5. Shalini Govil, Pai, *Principles of Computer Graphics*. 2005, Springer.
6. Steven Harrington, *Computer Graphics*. TMH.
7. F.S.Hill, S.M.Kelley, *Computer Graphics*. PHI.

III Year B.Tech. CSE-I Semester

**(1G153) COMPUTER NETWORKS
(Common to CSE and IT)**

UNIT I INTRODUCTION: Network Hardware, Network software, Reference Models-OSI, TCP/IP, Examples of Networks-the internet, connection oriented networks, ethernet, wirelesslans.

UNIT II PHYSICAL LAYER: Guided Transmission, Wireless Transmission, public switched telephone networks-structure of the telephone system, the local loop, trunks and multiplexing, switching.

UNIT III DATA LINK LAYER: Design issues, error detection and correction, Elementary data link Protocol, Sliding Window protocols, Data link layer in HDLC, Internet.

UNIT IV MEDIUM ACCESS SUB LAYER: The Channel Allocation Problem, Multiple access protocols, IEEE 802.X Standard Ethernet, wireless LANS.

UNIT V NETWORK LAYER: Network layer Design issues, Routing Algorithm-shortest path routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing, link state routing, Congestion Control Algorithms.

UNIT VI NETWORK LAYER: Quality of Service, Internet working, The Network layer in the internet-the ipprotocol, ipaddresses, internet control protocols, OSPF,BGP, cInternet multicasting, mobile ip, ipV6.

UNIT VII TRANSPORT LAYER: Transport Services, Elements of Transport protocols, Simple Transport Protocol, The Internet Transport Protocols-TCP and UDP protocols.

UNIT VIII APPLICATION LAYER: Network Security, Domain name system, Electronic Mail, the World Wide Web, Multi Media.

TEXT BOOKS:

1. Andrew S Tanenbaum, *Computer Networks*. Pearson Education/PHI, 4th Ed.

REFERENCE BOOKS :

1. Behrouz A. Forouzan, *Data Communications and Networking*. TMH, 3rd Ed.
2. S.Keshav, *An Engineering Approach to Computer Networks*. Pearson Education, 2nd Ed.
3. W.A. Shay, *Understanding communications and Networks*. Thomson, 3rd Ed.

III Year B.Tech. CSE-I Semester

(1G154) OPERATING SYSTEMS

UNIT I INTRODUCTION: What is an OS? Simple Batch Systems, Multi-Programmed Batched Systems, Time Sharing Systems, Personal Computer systems, Parallel Systems, Distributed Systems, Real Time Systems.

Operating System Structures: System Components, Operating System Services, System Calls, System Programs, System Structures, Virtual Machines.

UNIT II PROCESSES: Process Concept, Process Scheduling, Operation on Processing, Co-Operating Processes, Threads, Inter-Process Communication.

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms: FIFO, SJF, Priority, RRS Algorithm Evaluation.

UNIT III PROCESS SYNCHRONIZATION: Background, The Critical Section Problem, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors.

UNIT IV DEADLOCKS: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

UNIT V MEMORY MANAGEMENT: Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation.

Virtual Memory: Background, Demand Paging, Page Replacement, Page Replacement Algorithms:- FIFO, Optimal, LRU.

UNIT VI FILE SYSTEM INTERFERENCE: File Concept, Access Methods, Directory Structures, Protection.

File System Implementation: File system Structure, Allocation Methods, Free-Space Management, Directory Implementation.

UNIT VII SECONDARY STORAGE STRUCTURE: Disk Structure, Disk Scheduling, Disk Management, Swap Space Management, Disk Reliability, Stable Storage Implementation, Territory Storage Devices.

UNIT VIII PROTECTION: Goals of Protection, Domain of Protection, Access Matrix, Revocation of Access Rights.

Security:- The Security Problem, Authentication, One Time Password, Program Threats, System Threats, Threat Monitory, Encryption, Computer Security Classifications.

TEXT BOOKS:

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*. John Wiley, 7th Ed.
2. D.M. Dhamdhare, *Operating systems- A Concept based Approach*. TMH, 2nd Ed.

REFERENCE BOOKS:

1. Stallings, *Operating Systems' -Internal and Design Principles*. Pearson education / PHI, 2005, 5th Ed.
2. Crowley, *Operating System A Design Approach*, TMH.
3. Andrew S Tanenbaum, *Modern Operating Systems*. Pearson/PHI, 2nd Ed.

III Year B.Tech. CSE-I Semester

(1G155) PRINCIPLES OF PROGRAMMING LANGUAGES

UNIT I PRELIMINARY CONCEPTS: Reasons for studying concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories.

Programming Paradigms: Imperative, Object Oriented, functional Programming and Logic Programming. Programming Language Implementation methods, Programming environments.

UNIT II SYNTAX AND SEMANTICS: general Problem of describing Syntax and Semantics, formal methods of describing syntax, BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, Denotational semantics and axiomatic semantics for common programming language features.

UNIT III NAMES, BINDINGS, TYPE CHECKING AND SCOPES: Names, Variable, Scope and lifetime of variable, static and dynamic scope, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types.

UNIT IV EXPRESSIONS AND ASSIGNMENT STATEMENTS: Arithmetic, relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements,

Control Structures: Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT V SUBPROGRAMS AND BLOCKS: Fundamentals of sub-programs, Design issues of subprograms, local referencing environments, parameter passing methods, parameters that are sub-program names, overloaded sub-programs, generic sub-programs, and design issues for functions, user defined overloaded operators, co routines.

UNIT VI ABSTRACT DATA TYPES: The Concept of Abstractions and Encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT.

Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, concurrency in Ada95, Java threads.

UNIT VII EXCEPTION HANDLING: Exceptions, exception Propagation, Exception handling in PL/I, Ada, C++ and Java.

Logic Programming Language: Introduction and overview of logic programming, the origins of prolog, basic elements of prolog, application of logic programming.

UNIT VIII FUNCTIONAL PROGRAMMING LANGUAGES:

Introduction, fundamentals of FPL, LISP, ML, Haskell, The first functional Programming Language: LISP, application of Functional Programming Languages and comparison of functional and imperative Languages.

TEXT BOOKS:

1. Robert W. Sebesta, *Concepts of Programming Languages*. Pearson Education, 2008, 8th Ed.
2. D. A. Watt, *Programming Language Design Concepts*. Wiley Dreamtech, rp-2007.

REFERENCE BOOKS:

1. A.B. Tucker, R.E. Noonan, *Programming Languages*. TMH.
2. K. C.Louden, *Programming Languages*. Thomson, 2003, 2nd Ed.
3. Patric Henry Winston and Paul Horn, *LISP*, Pearson Education.
4. W.F. Clocksin and C.S.Mellish, *Programming in Prolog*. Springer, 5th Ed.
5. M.Lutz, *Programming Python*. O'reilly, SPD, rp-2007, 3rd Ed.
6. Chun, *Core Python Programming*. Pearson Education, 2007, 2nd Ed.
7. Michael Dawson, *Guide to Programming with Python*. Thomson, 2008.

III Year B.Tech. CSE-I Semester

(1G355) MICROPROCESSORS AND INTERFACING
(Common to CSE and IT)

UNIT I 8086 ARCHITECTURE: Architecture of 8086 microprocessor, Register organization, Memory organization, Pin diagram of 8086-Minimum mode and maximum mode of operation, Timing diagrams.

UNIT II ASSEMBLY LANGUAGE PROGRAMMING: Machine language instruction formats of 8086, Addressing modes of 8086, instruction set of 8086, Assembler directives, Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation. Implementation of FOR loop. WHILE, REPEAT and IF-THEN-ELSE features. Procedure and Macros.

UNIT III I/O INTERFACING: I/O Interfacing methods – I/O mapped I/O, Memory mapped I/O Interfacing I/O ports – latches and buffers. 8255 PPI-various modes of operation and interfacing to 8086. Seven segment Displays, stepper motor, D/A, A/D converter and actuators interfacing.,

UNIT IV MEMORY AND DMA CONTROLLER: Basic structure of SRAM and DRAM cell, Memory interfacing to 8086 (static RAM and EPROM). Need for DMA, Architecture of 8257 and interfacing with 8086

UNIT V PROGRAMMABLE INTERVAL TIMER/COUNTER: Data transfer methods-Programmed I/O; interrupt driven I/O, Interrupt structure of 8086, Vector interrupt table. Interrupt service routines. 8259 PIC architecture and interfacing, cascading of interrupt controller. Architecture of 8253 programmable interval timer/counter, mode of operations, interfacing with 8086.

UNIT VI COMMUNICATION INTERFACE: Asynchronous and synchronous data transfer schemes. Necessity of communication interfaces, 8251 USART architecture and interfacing. Serial communication standards-, RS-232C, 20mA current loop.TTL to RS232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to high-speed serial communications standards, and USB.

UNIT VII ADVANCED MICROPROCESSORS: Introduction to 80286.salient features of 80386, Real and protected mode segmentation and paging, salient features of Pentium and Pentium pro processors

UNIT VIII 8051 MICROCONTROLLER: Architecture of 8051, pin diagram, Addressing modes, instruction set, simple programs, memory organization, Timer/Counters, Serial Communication features, Interrupts.

TEXT BOOKS:

1. A.K. Ray and K.M.Bhurchandi, *Advanced microprocessor and peripherals*. TMH, 2000, 2nd Ed.
2. Douglas V.Hall, *Microprocessors Interfacing*. 2007, 2nd Ed.
3. Kenneth J Ayala, *The 8051 Microcontroller programming and Interfacing*.

REFERENCE BOOKS:

1. Liu and GA Gibson, *Micro computer system 8066/8088 family Architecture, programming and Design*. PHI, 2nd Ed.
2. Bhupendra singh chabra, *Intel 8086/8088 microprocessor architecture, programming, design and interfacing*, Dhanpatrai publications.

III Year B.Tech. CSE-I Semester

**(1GC53) SOFT SKILLS – II
(Common to CSE, IT and ME)**

ENGLISH FOR COMPETITIVE EXAMINATIONS

CORRECT ENGLISH USAGE: Articles – Prepositions – Tenses – Voice – Error spotting and correcting – Sentence improvement.

VOCABULARY: Synonyms – Antonyms – Analogy – Confusable Words.

ENGLISH PROFICIENCY: One-word substitutions – Idioms and Phrases – Homonyms – Spellings.

LOGIC-BASED ENGLISH LANGUAGE: Rearrangement of jumbled words and jumbled sentences – word pairs – sentence completion.

COMPREHENSION ABILITY: Reading comprehension – Cloze tests.

REFERENCE BOOKS:

1. R. S. Agarwal, *Objective English*. S. Chand Publishers.
2. Hari Prasad, *Objective English for Competitive Exams*. TMH.
3. Collins Cobuild, *English Guides: Confusable Words*.

III Year B.Tech. CSE-I Semester

**(1G358) MICRO PROCESSORS AND INTERFACING LAB
(Common to CSE and IT)**

1. Arithmetic operations
 - a) Series of n bytes/words addition
 - b) Multi byte Addition and Subtraction
 - c) 8/ 16 bit Multiplication and Division
 - d) Signed Arithmetic operations
 - e) ASCII – arithmetic operation.
 - f) Addition of two, 4 digit BCD numbers

2. Logical Operations
 - a) Code conversion – BCD \leftrightarrow ASCII, BCD \leftrightarrow HEX.
 - b) Number of 1's and 0's in a given word.
 - c) Packed BCD to unpacked BCD using shift instructions

3. String Operations
 - a) Relocate a string of N words/bytes.
 - b) Reverse String.
 - c) Bubble Sort
 - d) Length of the String
 - e) String Insertion
 - f) String Deletion
 - g) String comparison
 - h) Scanning a byte/ word.

4. Write near procedure for
 - a) Factorial of a given number
 - b) Largest/smallest number in an N number of given words.

5. Interfacing with 8255 PPI
 - a) DAC Interfacing: Sawtooth, Triangular, Staircase, sinusoidal and square wave generation in BSR mode.
 - b) Stepper Motor Interfacing: Rotation in Clock wise and Anti-clock wise direction.
6. 8259 – Interrupt Controller.
7. 8279 – Keyboard /Display controller.
8. 8251 - USART Interfacing

Microcontroller 8051:

9. Arithmetic operations – Addition, Subtraction, Multiplication and Division.
10. Reading and writing a port.
11. Serial communication implementation.
12. Square wave generation using Timer.

III Year B.Tech. CSE-I Semester

(1G156) COMPUTER NETWORKS AND OPERATING SYSTEMS LAB

Objective:

- To Understand the functionalities of various layers of OSI model
- To understand the operating System functionalities

System/ Software Requirement:

- Intel based desktop PCs LAN CONNECTED with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space

Part - A

1. Implement the data link layer framing methods such as character, 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 thru a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm.
5. Take an example subnet of hosts. Obtain broadcast tree for it.
6. Take a 64 bit playing text and encrypt the same using DES algorithm.
7. Write a program to break the above DES coding.
8. Using RSA algorithm Encrypt a text data and Decrypt the same.

Part -B

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.

III Year B.Tech. CSE-II Semester

(1G161) DISTRIBUTED SYSTEMS

UNIT I CHARACTERIZATION OF DISTRIBUTED SYSTEMS:

Introduction, Examples of Distributed systems, Resource sharing and web, challenges, **System models:** Introduction, Architectural and Fundamental models.

UNIT II Networking and Inter-networking, Inter-process Communication

Distributed objects and Remote Invocation: Introduction, Communication between distributed objects, RPC, Events and notifications, Case study-Java RMI.

UNIT III OPERATING SYSTEM SUPPORT:

Introduction, OS layer, Protection, Processes and Threads, Communication and Invocation, Operating system architecture. Distributed File Systems- Introduction, File Service architecture, case study- SUN network file systems.

UNIT IV NAME SERVICES: Introduction, Name Services and the Domain Name System, Case study of the Global Name Service, Case study of the X.500 Directory Service.

Peer to Peer Systems: Introduction, Napster and its legacy, Peer to Peer middleware, Routing overlays, Overlay case studies-Pastry, Tapestry, Application case studies-Squirrel, Ocean Store.

UNIT V TIME AND GLOBAL STATES: Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global states, distributed debugging.

Coordination and Agreement: Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

UNIT VI TRANSACTIONS AND CONCURRENCY CONTROL:

Introduction, Transactions, Nested Transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

UNIT VII DISTRIBUTED TRANSACTIONS: Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery, **Replication**-Introduction, System model and group communication, Fault tolerant services, Transactions with replicated data.

UNIT VIII SECURITY: Introduction, Overview of Security techniques, Cryptographic algorithms, Digital signatures, Case studies-Kerberos

TEXT BOOKS:

1. G Coulouris, J Dollimore and T Kindberg, *Distributed Systems Concepts and Design*, Pearson Education, 4th Ed.

REFERENCE BOOKS:

1. S.Mahajan and S.Shah, *Distributed Computing*. Oxford University Press.
2. Pradeep K.Sinha, *Distributed Operating Systems Concepts and Design*. PHI.
3. M Singhal, N G Shivarathri, *Advanced Concepts in Operating Systems*. TMH Edition.
4. K.P.Birman, *Reliable Distributed Systems*, Springer.
5. A.S. Tanenbaum and M.V. Steen, *Distributed Systems: Principles and Paradigms*. Pearson Education.
6. R.Chow, T.Johnson, *Distributed Operating Systems and Algorithm Analysis*. Pearson.
7. A.S.Tanenbaum, *Distributed Operating Systems*, Pearson Education.
8. S.Ghosh, *Distributed Systems*. Chapman Hall/CRC Taylor & Francis Group, 2010.

III Year B.Tech. CSE-II Semester

(1G162) CRYPTOGRAPHY AND NETWORK SECURITY

UNIT I Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT II Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT III Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

UNIT IV Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT V IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT VI Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT VII Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats.

UNIT VIII Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS:

1. William Stallings, *Network Security Essentials (Applications and Standards)*. Pearson Education, 3rd Ed.
2. Stallings, *Cryptography and network Security*. PHI/Pearson, 3rd Ed.

REFERENCE BOOKS:

1. Eric Maiwald, *Fundamentals of Network Security*. (Dreamtech press) 2004.

2. Charlie Kaufman, Radia Perlman and Mike Speciner, *Network Security - Private Communication in a Public World*. Pearson/PHI, 2nd Ed.
3. Robert Bragg, Mark Rhodes, *Network Security: The complete reference*. TMH.
4. Buchmann, *Introduction to Cryptography*. Springer.

III Year B.Tech. CSE-II Semester

(1G163) LINUX PROGRAMMING

UNIT I LINUX UTILITIES: File Handling Utilities, Security by File Permissions, Process Utilities, Disk Utilities, Networking Commands, Filters, Text Processing Utilities and Backup Utilities, Sed: Scripts, Operation, Addresses, Commands, Applications, Awk: Execution, Fields and Records, Scripts, Operation, Patterns, Actions, Functions, Using System Commands in Awk.

UNIT II Working with the Bourne Again Shell (Bash): Introduction, Shell Responsibilities, Pipes and Input Redirection, Output Redirection, Here Documents, Running a Shell Script, The Shell as a Programming Language, Shell Meta Characters, File Name Substitution, Shell Variables, Command Substitution, Shell Commands, The Environment, Quoting, Test Command, Control Structures, Arithmetic in Shell, Shell Script Examples, Interrupt Processing, Functions, Debugging Shell Scripts.

UNIT III FILES: File Concept, File System Structure, Inodes, File Attributes, File Types, Library Functions, The Standard I/O and Formatted I/O in C, Stream Errors, Kernel Support for Files, System Calls, File Descriptors, Low Level File Access – File Structure Related System Calls (File APIs), File and Record Locking, File and Directory Management – Directory File Apis, Symbolic Links & Hard Links.

UNIT IV Process, Process Concept, Kernel Support for Process, Process Attributes, Process Control, Process Creation, Waiting for a Process, Process Termination, Zombie Process, Orphan Process, Process APIs. Signals: Introduction to Signals, Signal Generation and Handling, Kernel Support for Signals, Signal Function, Unreliable Signals, Reliable Signals, Kill, Raise, Alarm, Pause, Abort, Sleep Functions.

UNIT V INTER PROCESS COMMUNICATION: Introduction to IPC, Pipes, Fifos, Introduction to Three Types of IPC-Message Queues, Semaphores and Shared Memory. Message Queues: Kernel Support for Messages, Unix System V APIs for Messages, Client/Server Example.

UNIT VI SEMAPHORES: Kernel Support for Semaphores, Unix System V Apis for Semaphores. Shared Memory: Kernel Support for Shared Memory, Unix System V APIs for Shared Memory, Semaphore and Shared Memory Example.

UNIT VII MULTITHREADED PROGRAMMING: Differences Between Threads and Processes, Thread Structure and Uses, Threads and Lightweight Processes, POSIX Thread APIs, Creating Threads, Thread Attributes, Thread Synchronization with Semaphores and with Mutexes, Example Programs.

UNIT VIII SOCKETS: Introduction to Sockets, Socket Addresses, Socket System Calls for Connection Oriented Protocol and Connectionless Protocol, Example-Client/Server Programs.

TEXT BOOKS:

1. B.A.Forouzan and R.F.Gilberg, *Unix and Shell programming*. Cengage Learning.
2. N.Matthew, R.Stones, Wrox, *Beginning Linux Programming*. Wiley India Edition, 4th Ed.
3. T.Chan, *Unix System Programming using C++*. PHI (UNIT III to UNIT VIII).
4. Sumitabha Das, *Unix Concepts and Applications*, TMH, 4th Ed.

REFERENCE BOOKS:

1. Robert Love, *Linux System Programming*. O'Reilly, SPD.
2. W.R.Stevens, *Advanced Programming in the Unix environment*. Pearson Education, 2nd Ed.
3. W.R.Stevens, *Unix Network Programming*. PHI.
4. Graham Glass, King Ables, *Unix for programmers and users*. Pearson Education.
5. S.M.Sarwar, R.Koretsky, S.A.Sarwar, *Unix The Text book*. Pearson Education, 3rd Ed.
6. U.Vahalia, *Unix Internals*, Pearson Education.
7. S.G.Kochan and P.Wood, *Unix Shell Programming*. Pearson Education, 3rd Ed.

III Year B.Tech. CSE-II Semester

**(1G164) OBJECT ORIENTED ANALYSIS AND DESIGN
(Common to CSE and IT)**

UNIT I INTRODUCTION TO UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, UML architecture, Software development life cycle.

UNIT II BASIC STRUCTURAL MODELING: Terms, Concepts, Classes, Relationships, Common mechanisms, modeling techniques for class diagrams.

UNIT III ADVANCED STRUCTURAL MODELING: Terms, Concepts Advanced classes, Advanced Relationships, Interfaces, Types and Roles, Packages, modeling techniques for object diagrams.

UNIT IV BASIC BEHAVIORAL MODELING- I: Interactions, Interaction diagrams

UNIT V BASIC BEHAVIORAL MODELING- II: Use cases, Use case diagrams

UNIT VI ADVANCED BEHAVIORAL MODELING: Events and Signals, State Machines, Processes and Threads, Time and Space, State chart diagrams

UNIT VII ARCHITECTURAL MODELING: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT VIII CASE STUDIES:

Case Study (i): The Unified library application.

Case Study (ii): ATM Application

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson, *The Unified Modeling Language User Guide*. Pearson Education
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, *UML 2 Toolkit*, Wiley-Dreamtech India Pvt. Ltd.

REFERENCE BOOKS:

1. Meilir Page-Jones, *Fundamentals of Object Oriented Design in UML*. Pearson Education.

2. Pascal Roques, *Modeling Software Systems Using UML2*. Wiley Dreamtech India Pvt. Ltd.
3. Atul Kahate, *Object Oriented Analysis and Design*. The McGraw-Hill Companies.
4. John W. Satzinger, Robert B Jackson and Stephen D Burd, *Object-Oriented Analysis and Design with the Unified Process*. Cengage Learning.
5. Russ Miles and Kim Hamilton, *Learning UML 2.0*. O'Reilly, SPD.
6. Craig Larman, *Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process*. Pearson Education.
7. R.C.Lee and W.M.Tepfenhart, *UML and C++*. PHI.
8. B.Dathan and S.Ramnath, *Object Oriented Analysis, Design and Implementation*. Universities Press.
9. K.Barclay, J.Savage, *OODesign with UML and Java*. Elsevier.
10. Mark Priestley, *Practical Object-Oriented Design with UML*. TMH.

III Year B.Tech. CSE-II Semester

(1G165) SOFTWARE ENGINEERING

UNIT I INTRODUCTION TO SOFTWARE ENGINEERING: The evolving role of software, Changing Nature of Software, legacy software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

UNIT II PROCESS MODELS: The waterfall model, Incremental process models, Evolutionary process models, Specialized process models, The Unified process. Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT III REQUIREMENTS ENGINEERING PROCESS: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT IV DESIGN ENGINEERING: Design process and Design quality, Design concepts, the design model, pattern based software design. Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design, assessing alternative architectural designs, mapping data flow into software architecture.

UNIT V MODELING COMPONENT-LEVEL DESIGN: Designing class-based components, conducting component-level design, Object constraint language, designing conventional components. Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT VI TESTING STRATEGIES: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. Product metrics: Software Quality, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT VII METRICS FOR PROCESS AND PRODUCTS: Software Measurement, Metrics for software quality. Risk management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk

refinement, RMMM, RMMM Plan.

UNIT VIII QUALITY MANAGEMENT: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS:

1. Roger S Pressman, *Software Engineering: A practitioner's Approach*. McGrawHill International Edition, 2005, 6th Ed.
2. Ian Sommerville, *Software Engineering*. Pearson Education, 2004, 7th Ed.

REFERENCE BOOKS:

1. Rajib Mall, *Fundamentals of Software Engineering*. PHI, 2005.
2. Pankaj Jalote, *Software Engineering: A Precise Approach*. Wiley India, 2010.
3. Waman S Jawadkar, *Software Engineering: A Primer*. Tata McGraw-Hill, 2008.
4. Deepak Jain, *Software Engineering, Principles and Practices*. Oxford University Press.
5. Diner Bjorner, *Software Engineering1: Abstraction and modeling*. Springer International edition, 2006.
6. Diner Bjorner, *Software Engineering2: Specification of systems and languages*. Springer International edition, 2006.
7. Yingxu Wang, *Software Engineering Foundations*. Auerbach Publications, 2008.
8. Hans Van Vliet, *Software Engineering Principles and Practice*, John Wiley & Sons Ltd, 3rd Ed.

III Year B.Tech. CSE-II Semester

**(1GA61) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to CSE and EEE)**

UNIT I INTRODUCTION TO MANAGERIAL ECONOMICS: Definition, Nature and Scope of Managerial Economics – Relationship with other functional areas (Accounting, Marketing, HR, Production and Operations) of decision making - Basic Economic Principles - Opportunity Cost, Incremental Concept, scarcity, Marginalism, Equi-marginalism, Time perspective, Discounting principle, Risk and Uncertainty.

UNIT II DEMAND ANALYSIS: Meaning and types of demand – Determinants of demand - Law of Demand and its exceptions. Definition, types and measurement of elasticity of demand – Supply function and Elasticity of Supply - Demand Forecasting methods: Survey Methods - Consumers Survey Method, Sales force opinion method, experts opinion method - Statistical Methods: Trend Projection, Barometric, Regression, Simultaneous Equation method.

UNIT III PRODUCTION AND COST ANALYSIS: Production Function, Cobb - Douglas Production function - Isoquants and Isocosts curves – MRTS - Least Cost Combination of Inputs - Laws of Returns, Internal and External Economies of Scale - Cost concepts, Determinants of cost, cost-output relationship in short run and Long run - Break-even Analysis (BEA): Objectives, Assumptions, Importance, Graphical representation, Limitations (Simple Numerical Problems).

UNIT IV MARKET STRUCTURE AND PRICING METHODS: Competitive structure of markets – Perfect competition - Monopoly, Monopolistic and Oligopoly Markets - Price-output determination under perfect competition and monopoly in Long run and short run.

Pricing Methods: Cost Plus Pricing - Marginal Cost Pricing - Sealed Bid Pricing - Going Rate Pricing - Limit Pricing - Market Skimming Pricing - Penetration Pricing - Two-Part Pricing - Block Pricing - Bundling Pricing - Peak Load Pricing.

UNIT V TYPES OF BUSINESS ORGANIZATIONS: Forms of Business Organizations – Need and role of public and private sector business organization - Types, Features, Merits and Demerits of public and private sector business organizations – Problems and remedies of public sector business organizations.

UNIT VI CAPITAL AND CAPITAL BUDGETING: Capital and its significance - Types of Capital - Sources of Raising Capital – Features of Capital budgeting - Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), Net Present Value Method, Profitability index and Internal rate of return method (Simple problems).

UNIT VII FINANCIAL ACCOUNTING: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts - Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.

UNIT VIII FINANCIAL ANALYSIS THROUGH RATIOS: Financial Ratios and its significance - Liquidity Ratios: Current Ratio, quick ratio and Absolute quick ratio - Turnover Ratios: Inventory turnover ratio, Debtors Turnover ratio, Working Capital Turnover ratio, Creditors Turnover ratio, Fixed Assets Turnover ratio - Solvency Ratios: Debt- Equity ratio, Interest Coverage ratio and Debt to total funds ratio -Profitability ratios: Gross Profit Ratio, Net Profit ratio and Proprietary ratio.

TEXT BOOKS:

1. Mehta P.L., *Managerial Economics-Analysis, Problems, Cases*. S Chand and Sons, New Delhi, 2001.
2. Dwivedi, *Managerial Economics*. Vikas, 6th Ed.
3. S.N.Maheswari & S.K. Maheswari, *Financial Accounting*. Vikas.
4. M.E.Thukaram Rao, *Accounting for Managers*. New Age International Publishers.

REFERENCE BOOKS:

1. Varshney & Maheswari, *Managerial Economics*, Sultan Chand, 2003.
2. T.S. Reddy and Y.Hari Prasad Reddy, *Accounting and Financial Management*, Margham Publications.
3. Ambrish Gupta, *Financial Accounting for Management*, Pearson Education, New Delhi.
4. S. A. Siddiqui & A. S. Siddiqui, *Managerial Economics & Financial Analysis*, New age International Space Publications.
5. Narayanaswamy, *Financial Accounting—A Managerial Perspective*, PHI
6. Truet and Truet, *Managerial Economics:Analysis, Problems and Cases*, Wiley.

III Year B.Tech. CSE-II Semester

**(1GC61) ADVANCED ENGLISH COMMUNICATION SKILLS LAB
(Common to CSE, IT and ME)**

RESUME PREPARATION

Structure, formats and styles – planning - defining career objective - projecting one's strengths and skills - creative self marketing–sample resumes - cover letter.

INTERVIEW SKILLS

Concept and process - pre-interview planning – preparation - body language - answering strategies – frequently asked questions.

GROUP DISCUSSION

Communicating views and opinions – discussing – intervening – agreeing and disagreeing –asking for and giving clarification - substantiating - providing solution on any given topic across a cross-section of individuals - modulation of voice and clarity - body language – case study.

ORAL PRESENTATIONS (INDIVIDUAL)

Collection of data from various sources –planning, preparation and practice – attention gathering strategies -transition – handling questions from audience.

ORAL PRESENTATIONS (TEAM)

Appropriate use of visual aids – Using PowerPoint for presentation.

READING COMPREHENSION

Reading for facts – scanning – skimming - guessing meanings from context– speed reading.

LISTENING COMPREHENSION

Listening for understanding - responding relevantly.

MINIMUM REQUIREMENTS:

Advanced English Language Communication Skills Lab is conducted at two places:

- Computer-aided Language Lab with 60 computer machines, one teacher console, LAN facility and Language Learning software for self-study.
- Communication Skills Lab with movable chairs, a discussion room, Public Address System, a Television, a DVD Player, a camcorder, an LCD Projector and a computer machine.

- Manual cum Record, prepared by Faculty Members of English of the college will be used by students.

SUGGESTED SOFTWARE:

- It's your Job published by Clarity.
- Business Writing published by Clarity.
- Active Listening published by Clarity.
- Active Reading published by Clarity.
- Software published by Globerana.
- Cambridge Advanced Learner's Dictionary.
- Oxford Advanced Learner's Dictionary.

III Year B.Tech. CSE-II Semester

(1G167) LINUX PROGRAMMING LAB

1. Program on process creation and Execution
 - a. To display Environment variables.
 - b. To implement Different types of exec functions.
2. Write a program
 - a. To Opening a stream
 - b. To Read and Write a stream
 - c. To Position a Stream
3. Write a program to
 - a. Create a file
 - b. Add record to file
 - c. Modify records
 - d. Delete records
 - e. Find status and mode value of a file
4. Write a Program that takes certain file names along the command line arguments and remove if there exists any duplicates.
5. Write a Program to find whether a file is having read, write, execute permissions and also check whether a given name is file or directory.
6. Write a program to create a chain of Processes.
7. Write a program to
 - a. Create the semaphores
 - b. Set values to semaphores
 - c. Get the values from the semaphores
 - d. Remove semaphores
8. Write a program to implement various operations on Message Queues.
9. Write a program to demonstrate
 - a. Signal handling
 - b. Terminal I/O
10. Perform Socket Programming Using
 - a. UDP socket
 - b. TCP socket
11. Write a program to
 - a. Create a shared memory
 - b. Write to shared memory
 - c. Read from shared memory
12. Write a program to create two pipes.
13. Write a program which takes a source file name and directory name as command line argument and print a message 'YES', if the file is found in the given directory.

14. Design a directory structure that improves the efficiency of searching for pathnames by avoiding the linear search
15. Implement free disk block list with a bitmap instead of linked list.
16. Design a scheme that reduces the number of directory searches for file names by caching frequently used names.
17. Redesign getblk and brelse where the kernel follows a FIFO scheme instead of LRU.
18. Design algorithm for allocating and freeing memory page and page tables Many process can sleep on an address but the kernel may want to wakeup selected processes that receive a signal assuming that the signal mechanism can identify the particular processes, modify the wakeup algorithm so that only one process is woken up on a sleep address instead of all the processes.
19. Implement a new system call newpgrp(PID, ngrp), that resets the process group of another process identified by the process ID PID to ngrp.
20. Implement a new system call nowait(PID) where PID identifies a child of the process issuing the call when issuing the call the process informs the kernel that it will never wait for the child process to exit, so that the kernel can immediately cleanup the child process slot when the child dies.

IV Year B.Tech. CSE-I Semester

(1G171) DATA WAREHOUSING AND MINING

UNIT I INTRODUCTION TO DATA MINING: What is data mining, motivating challenges, origins of data mining, data mining tasks , Types of Data-attributes and measurements, types of data sets, Data Quality.

UNIT II DATA PREPROCESSING, MEASURES OF SIMILARITY AND DISSIMILARITY: Basics, similarity and dissimilarity between simple attributes, dissimilarities between data objects, similarities between data objects, examples of proximity measures: similarity measures for binary data, Jaccard coefficient, Cosine similarity, Extended Jaccard coefficient, Correlation, Exploring Data: Data Set, Summary Statistics.

UNIT III DATA WAREHOUSE: BASIC CONCEPTS: Data Warehousing Modeling: Data Cube and OLAP, **Data Warehouse implementation:** efficient data cube computation, partial materialization, indexing OLAP data, efficient processing of OLAP queries.

UNIT IV CLASSIFICATION: Basic Concepts, General approach to solving a classification problem, Decision Tree induction: working of decision tree, building a decision tree, methods for expressing attribute test conditions, measures for selecting the best split, Algorithm for decision tree induction.
Model over fitting: Due to presence of noise, due to lack of representation samples, evaluating the performance of classifier: holdout method, random sub sampling, cross-validation, bootstrap.

UNIT V CLASSIFICATION-ALTERNATIVE TECHNIQUES:
Bayesian Classifier: Bayes theorem, using bayes theorm for classification, Naïve Bayes classifier, Bayes error rate, Bayesian Belief Networks: Model representation, model building.

UNIT VI ASSOCIATION ANALYSIS: Problem Definition, Frequent Item-set generation- The Apriori principle , Frequent Item set generation in the Apriori algorithm, candidate generation and pruning, support counting (eluding support counting using a Hash tree) , Rule generation, compact representation of frequent item sets, FP-Growth Algorithms.

UNIT VII Overview- types of clustering, Basic K-means, K –means –additional issues, Bisecting k-means, k-means and different types of clusters, strengths and weaknesses, k-means as an optimization problem.

UNIT VIII Agglomerative Hierarchical clustering, basic agglomerative hierarchical clustering algorithm, specific techniques, DBSCAN: Traditional density: center-based approach, strengths and weaknesses.

TEXT BOOKS:

1. Pang-Ning tan, Michael Steinbach, Vipin Kumar, *Introduction to Data Mining*. Pearson. (Unit 1, 2, 4, 5, 6, 8).
2. Jiawei Han, Micheline Kamber, *Data Mining Concepts and Techniques*. Elsevier, 3rd Ed. (Unit 3).

REFERENCE BOOKS:

1. G.K. Gupta, *Introduction to Data Mining with Case Studies*. PHI, 2nd Ed.
2. Dunham, Sridhar, *Data Mining: Introductory and Advanced Topics*. Pearson.
3. Alex Berson, Stephen J Smith, *Data Warehousing, Data Mining & OLAP*. TMH.
4. Soman, Diwakar, Ajay, *Data Mining Theory and Practice*, PHI, 2006.

IV Year B.Tech. CSE-I Semester

(1G172) OPEN SYSTEMS FOR WEB TECHNOLOGIES

UNIT I INTRODUCTION TO WEB TECHNOLOGIES: Introduction to Web servers like Apache 1.1,IIS XAMPP(Bundle Server), WAMP(Bundle Server),Handling HTTP Request and Response ,installations of above servers.

UNIT II INTRODUCTION TO PHP: The problem with other Technologies (Servelets and JSP), Downloading, installing, configuring PHP, Programming in a Web environment and The anatomy of a PHP Page.

UNIT III OVERVIEW OF PHP DATA TYPES AND CONCEPTS: Variables and data types, Operators, Expressions and Statements, Strings, Arrays and Functions.

UNIT IV OVERVIEW OF CLASSES, OBJECTS, AND INTERFACES: Creating instances using Constructors, Controlling access to class members, Extending classes, Abstract classes and methods, using interfaces, Using class destructors, File Handling and Using Exceptions.

UNIT V PHP ADVANCED CONCEPTS: Using Cookies, Using HTTP Headers, Using Sessions, Authenticating users, Using Environment and Configuration variables, Working with Date and Time.

UNIT VII CREATING AND USING FORMS: Understanding Common Form Issues, GET vs. POST, Validating form input, Working with multiple forms, and Preventing Multiple Submissions of a form.

UNIT VII PHP AND DATABASE ACCESS: Basic Database Concepts, Connecting to a MYSQL database, Retrieving and Displaying results, Modifying, Updating and Deleting data. MVC architecture.

UNIT VIII PHP AND OTHER WEB TECHNOLOGIES: PHP and XML, PHP and AJAX

TEXT BOOKS:

1. Jason Gilmore, *Beginning PHP and MySQL*. Apress Publications (Dream tech.), 3rd Ed.
2. Lee Babin, Nathan A Good, Frank M. Kromann and Jon Stephens, *PHP 5 Recipes A problem Solution Approach*.

REFERENCE BOOKS:

1. J.Lee and B.Ware, *Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP*. (Addison Wesley) Pearson Education.
2. Julie Meloni and Matt Telles, *PHP 6 Fast and Easy Web Development*. Cengage Learning Publications.
3. Bayross and S.Shah, *PHP 5.1. I.*, The X Team, SPD.
4. E.Quigley, *PHP and MySQL by Example*. Prentice Hall (Pearson).
5. V.Vaswani, *PHP Programming solutions*, TMH.

IV Year B.Tech. CSE-I Semester

(1G173) SOFTWARE PROJECT MANAGEMENT

UNIT I CONVENTIONAL SOFTWARE MANAGEMENT: The Waterfall Model, Conventional software Management Performance. Evolution of Software Economics: Software Economics, Pragmatic Software Cost Estimation.

UNIT II IMPROVING SOFTWARE ECONOMICS: Reducing Software Product Size, Improving software Processes, Improving Team Effectiveness, Improving Automation, Achieving Required Quality, Peer Inspections.

UNIT III CONVENTIONAL AND MODERN SOFTWARE MANAGEMENT: Principles of Conventional Software Engineering, Principles of Modern Software Management, Transitioning to an Iterative Process. **Life Cycle Phases:** Engineering and Production Stages, Inception. Elaboration, Construction, Transition Phases.

UNIT IV ARTIFACTS OF THE PROCESS: The Artifact Sets. Management Artifacts, Engineering Artifacts, **Programmatic Artifacts.** Model Based Software Architectures: A Management Perspective and Technical Perspective.

UNIT V FLOWS OF THE PROCESS: Software Process Workflows. Inter Trans Workflows. **Checkpoints of the Process :**Major Mile Stones, Minor Milestones, Periodic Status Assessments. Interactive **Process Planning:** Work Breakdown Structures, Planning Guidelines, Cost and Schedule Estimating. Interaction Planning Process. Pragmatic Planning.

UNIT VI PROJECT ORGANIZATIONS AND RESPONSIBILITIES: Line-of-Business Organizations, Project Organizations, and Evolution of Organizations. Process Automation: Automation Building Blocks, the Project Environment.

UNIT VII PROJECT CONTROL AND PROCESS INSTRUMENTATION: Server Care Metrics, Management Indicators, Quality Indicators, Life Cycle Expectations Pragmatic Software Metrics, Metrics Automation. Tailoring the process: Process Discriminates, Example.

UNIT VIII Modern Project Profiles Next Generation Software economics, Modern Process Transitions. Case Study: The Command Center Processing and Display System –Replacement (CCPDS-R)

TEXT BOOKS:

1. Walker Rayce, *Software Project Management*. PEA. 1998.
2. Henrey, *Software Project Management*. Pearson.

REFERENCE BOOKS:

1. Richard H. Thayer, *Software Engineering Project Management*. IEEE Computer Society, 1997.
2. Shere K. D, *Software Engineering and Management*. PHI. 1998
3. S. A. Kelkar , *Software Project Management: A Concise Study*. PHI.
4. Hughes Cotterell, *Software Project Management*, TMH. 2nd Ed.
5. Kaeron Conway, *Software Project Management from Concept to Development*. Dream Tech.

IV Year B.Tech. CSE-I Semester

**(1GA71) MANAGEMENT SCIENCE
(Common to CSE and EEE)**

UNIT I MANAGEMENT AND ORGANISATION STRUCTURE: Meaning, Nature, Importance and Functions of Management-Taylor's Scientific Management- Fayol's Principles of Management- Systems Approach to Management- Need of Organisation Structure -Types of Organisation Structure (Line, Line and Staff, Functional and Matrix Organisations) Its Merits, Demerits and Relevance.

UNIT II OPERATIONS MANAGEMENT: Plant Location and Layout - Methods of Production (Job, Batch and Mass Production)- Work Study - Statistical Quality Control: X Chart, R Chart, C and P Chart, (Simple Problems) Objectives of Inventory Management- Need for Inventory Control-Method of Inventory Management : EOQ, ABC Analysis- Purchase Procedure and Stores Management.

UNIT III MARKETING MANAGEMENT: Core Concepts and Functions of Marketing - Market Segmentation and Targeting – Marketing Mix: Product Levels -Product Life Cycle - New Product Development Process – Channels of Distribution - Marketing Communication - Consumer Protection Act 1986.

UNIT IV HUMAN RESOURCES MANAGEMENT (HRM): Concepts Of HRM- Basic Functions of HR Manager : Manpower Planning , Recruitment Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration - Meeting Competitive Challenges Through HRM Practices

UNIT V PROJECT MANAGEMENT (PERT/CPM): Network Drawing - Programme Evaluation and Review Technique (PERT) - Critical Path Method (CPM) - Probability of Completing The Project Within Given Time - Project Crashing (Simple Problems).

UNIT VI STRATEGIC MANAGEMENT: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps In Strategy Formulation and Implementation.

UNIT VII ADVANCES IN MANAGEMENT PRACTICES: Basic Concepts and Overview of Management Information System (MIS), Enterprise Resource Planning (ERP), Value Analysis, Just –In-Time (JIT), Total Quality Management

(TQM) and Supply Chain Management.

UNIT VIII MANAGEMENT ETHICS AND SOCIAL RESPONSIBILITY:

Overview of Ethics-Nature And Objectives of Ethics - Relationship Between Ethics and an Organisation - Normative Ethical Theories (Egoism, Utilitarianism and Altruism) Characteristics of an Ethical Organisation- Ethical Issues In Operations Management, Human Resource Management and Information Technology.

TEXT BOOKS:

1. Stoner, Freeman, Gilbert, *Management*, Pearson Education, New Delhi, 2004, 6th Ed.
2. Shridhara Bhat, *Production and operation management*, HPH.
3. Kotler Philip & Keller Kevin Lane, *Marketing Management*. PHI, 2005, 12th Ed.
4. *Personnel and Human Resource Management*. HPH.
5. Thomson Strickland, *Strategic Management*. TMH, 2005.
6. Fernando, *Business Ethics – An Indian perspective*. Pearson Education, 2009.

REFERENCE BOOKS:

1. Harnold Koontz, Cyril 'O' Donnell, *Essentials of Management*. Tata McGraw Hill, New Delhi, 1979.
2. Dessler Gary, *Human Resource Management*. Pearson/Prentice Hall of India 2006, 10th Ed.
3. V.S. Ramaswamy and S. Namakumari, *Marketing Management*. McMillan, 2010, 4th Ed.
4. S K Mukhopadhyay, *Production, Planning and Control Text and Cases*. PHI, New Delhi. 2009.
5. Laura P Hartman , *Perspectives in Business Ethics*. Tata McGraw Hill.
6. Kazmi, *Business Policy and Strategic Management*. 2/e, TMH.

IV Year B.Tech. CSE-I Semester

(1G174) HIGH PERFORMANCE COMPUTING
(ELECTIVE I)

UNIT I INTRODUCTION: The different forms of computing, The strengths and weaknesses of Distributed computing, Operating system concepts relevant to distributed computing, the architecture of distributed applications. Paradigms for Distributed Applications, choosing a Paradigm for an application (trade-offs).

UNIT II Parallel computing overview, parallel programming models and Paradigms.

UNIT III CLUSTER COMPUTING: Introduction, Cluster Architecture, Applications of Clusters.

UNIT IV GRID COMPUTING: Introduction, Grid Computing Anatomy – Architecture, Architecture and relationship to other Distributed Technologies, Grid computing road map.

UNIT V Merging the Grid services Architecture with the Web Services Architecture.

UNIT VI OPEN GRID SERVICE ARCHITECTURE: Introduction, Architecture and Goal, Sample Use cases: Commercial Data Center, National Fusion Collaboratory, Online Media and Entertainment. OGSA platform Components, Open Grid Services Infrastructure.

UNIT VII GLOBUS GT3 TOOLKIT: Architecture, Programming Model.

UNIT VIII A sample implementation, High Level services, OGSI.NET Middleware Solutions.

TEXT BOOKS:

1. M.L.Liu, *Distributed Computing, Principles and Applications*. Pearson Education, 2004.
2. Rajkumar Buyya, *High Performance Cluster Computing*. Pearson education.
3. Joshy, Joseph and Craig Fellenstein, *Grid Computing*. Pearson education, 2004.

REFERENCE BOOKS:

1. Fran Berman, Geoffrey C Fox, Anthony J G Hey, *Grid Computing: Making the global infrastructure a reality*, Wiley India, 2010.
2. D.Minoli, *A Networking Approach to Grid Computing*. Wiley & sons, 2006.

3. A.Abbas, *Grid Computing: A Practical Guide to Technology and Applications*. Firewall Media, 2008.

IV Year B.Tech. CSE-I Semester

(1G175) ADVANCED COMPUTER ARCHITECTURE
(ELECTIVE I)

UNIT I PARALLEL COMPUTER MODELS: The state of computing- Multiprocessors and Multi computers- Multivector and SIMD Computers-PRAM and VLSI Models- Architectural Development tracks.

Program and Networks Properties: - Conditions of Parallelism- Program Partitioning and Scheduling- Program Flow Mechanisms-System Interconnect Architectures.

UNIT II PRINCIPLES OF SCALABLE PERFORMANCE: Performance Metrics and Measures- Parallel Processing Applications-Speedup Performance Laws-Scalability Analysis and Approaches.

Processors and Memory Hierarchy: Advanced Processor Technology- Superscalar and Vector Processors- Memory Hierarchy Technology.

UNIT III BUS, CACHE AND SHARED MEMORY: Bus Systems-Cache Memory Organizations-Shared-Memory Organizations.

Pipelining and Super Scalar Techniques: Linear Pipeline Processors-Nonlinear Pipeline Processors-Instruction Pipeline Design-Arithmetic Pipeline Design.

UNIT IV MULTIPROCESSORS AND MULTICOMPUTERS: Multiprocessor System Interconnects-Cache Coherence and Synchronization Mechanisms-Three Generations of Multicomputers – Message-Passing Mechanisms.

UNIT V MULTIVECTOR AND SIMD COMPUTERS: Vector Processing Principles-Multivector MultiProcessors-Compound Vector Processing-SIMD Computer Organizations-The Connection Machine CM-5.

UNITVI SCALABLE, MULTITHREADED, AND DATAFLOW ARCHITECTURES: Latency –Hiding Techniques-Principles of Multithreading-Fine-Grain Multicomputers-Scalable and Multithreaded Architectures- Dataflow and Hybrid Architectures.

UNIT-VII INSTRUCTION LEVEL PARALLELISM: Introduction-Basic Design Issues-Problem Definition-Model of a Typical Processor- Operand Forwarding-Reorder Buffer-Register Renaming-Tomasulo's Algorithm- Branch Prediction- Limitations in Exploiting Instruction Level Parallelism-Thread Level Parallelism.

UNIT-VIII TRENDS IN PARALLEL SYSTEMS: Brief Overview of Technology-Forms of Parallelism-Case Studies

TEXT BOOK:

1. Kai Hwang & Jotwani, *Advanced Computer Architecture*. McGraw-Hill Publications, 2nd Ed.

REFERENCE BOOKS:

1. D.Sima, T.Fountain, P.Kacsuk, *Advanced Computer Architecture*. Pearson Education.
2. John L.Hennessy & David A. Patterson, Morgan Kufmann, *Computer Architecture A quantitative approach*. An Imprint of Elsevier, 3rd Ed.
3. Hwang and Briggs, *Computer Architecture and parallel processing*.

IV Year B.Tech. CSE-I Semester

**(1G374) EMBEDDED SYSTEMS
(ELECTIVE I)
(Common to CSE and IT)**

UNIT I INTRODUCTION TO EMBEDDED SYSTEMS: Embedded System – Definition, Application Areas, and Categories. Overview of embedded system architecture, specialties: reliability, performance, power consumption cost, size, user interface, software upgradation capability, recent trends: processor, power, memory, operating system, communication interface, programming languages, development tools, programmable hardware.

UNIT II ARCHITECTURE OF EMBEDDED SYSTEMS: Hardware Architecture – CPU, Memory, Clock Circuitry, Watch dog Timer/Reset Circuitry, chip select, I/O devices, Debug Port, Communication Interfaces, Power supply Unit. Software Architecture – Services provided by an operating System, Architecture and categories of Embedded Operating Systems, Application Software, Communication software, Process of generating Executable image, Development/Testing tools.

UNIT III 8051 MICROCONTROLLER: Introduction, Architecture, Register Organization, Internal and External Memory, Pin diagram, I/O port structure, Addressing modes, Instruction Set, simple programs.

UNIT IV ON-CHIP PERIPHERALS: 8051 Interrupt Structure, Timer/Counter features, modes and programming, Serial Communication Interface.

UNIT V APPLICATIONS: Interfacing with switches, display – LED, seven segment displays, LCD. Keyboard interfacing, D/A and A/D interfacing, Stepper motor interfacing, Handling External Interrupts.

UNIT VI COMMUNICATION INTERFACES: Need for Communication interface, RS232/UART, RS 422/RS 485, USB, Infrared, IEEE 1394 fire wire, IEEE 802.11, Blue tooth, I2C and CAN Bus.

UNIT VII REAL TIME OPERATING SYSTEM – I: Architecture of Kernel, Tasks and Task Scheduler, Interrupt Service Routines, Inter process Communication– Semaphores, mutex, message queues, mailboxes, pipes, signals, event registers and timers. Priority Inversion Problem.

UNIT VIII REAL TIME OPERATING SYSTEM – II: Off the Shelf Operating Systems, Embedded Operating Systems, Real Time Operating Systems, And Handheld Operating Systems.

TEXT BOOKS:

1. K.V.K.K. Prasad, *Embedded/ Real Time Systems*. Dreamtech press.
2. Kenneth J Ayala, *The 8051 Microcontroller*. Thomson Press, 3rd Ed.

REFERENCE BOOKS:

1. Wyene Wolf, *Computers and Components*. Elseveir.
2. Raj Kamal, *Embedded Systems*. TMH, 2008, , 2nd Ed.

IV Year B.Tech. CSE-I Semester

**(1G176) NETWORK MANAGEMENT SYSTEMS
(ELECTIVE II)**

UNIT I DATA COMMUNICATIONS AND NETWORK MANAGEMENT OVERVIEW: Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

UNIT II SNMPv1 NETWORK MANAGEMENT: Organization and Information and Information Models.

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

UNIT III SNMPv1 NETWORK MANAGEMENT: Communication and Functional Models. The SNMP Communication Model, Functional model.

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

UNIT V SNMP MANAGEMENT - RMON: What is Remote Monitoring?, RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON.

UNIT VI TELECOMMUNICATIONS MANAGEMENT NETWORK: Why TMN?, Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, Implementation Issues.

UNIT VII NETWORK MANAGEMENT TOOLS AND SYSTEMS: Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.

UNIT VIII WEB-BASED MANAGEMENT: NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise

Management, WBEM: Windows Management Instrumentation.

TEXT BOOK:

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

REFERENCE BOOKS:

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

IV Year B.Tech. CSE-I Semester

**(1G177) NETWORK PROGRAMMING
(ELECTIVE II)**

UNIT I INTRODUCTION TO NETWORK PROGRAMMING: OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Port numbers, TCP port numbers & Concurrent serves, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

UNIT II SOCKETS: Socket Address structures, value – result arguments, Byte ordering and manipulation functions, inet_aton, inet_addr, inet_ntoa, inet_pton, inet_ntop functions, read & write functions.

Elementary TCP sockets: Socket, connect, bind, listen, accept, fork and exec functions, concurrent servers. Close function, getsockname, getpeername functions.

UNIT III TCP CLIENT SERVER: Introduction, TCP Echo server functions, Normal startup, terminate and POSIX signal handling, handling SIGCHLD signals, wait and waitpid functions, summary of TCP output, server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT IV I/O MULTIPLEXING AND SOCKET OPTIONS: I/O Models, select function, Batch input, shutdown function, pollfunction, socket options, getsockopt and setsockopt functions. Socket states, Generic socket option, IPV4 socket option, IPV6 socket option and TCP socket options.

UNIT V ELEMENTARY UDP SOCKETS: Introduction, sendto and recvfrom, UDP Echo client-server program, lost datagram, summary of UDPexample, Lack of flow control with UDP, determining outgoing interface with UDP.

UNIT VI ELEMENTARY NAME AND ADDRESS CONVERSIONS: DNS, gethostbyname function, Resolver option, Function and IPv6 support, uname function, other networking information.

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

UNIT VIII REMOTE LOGIN: Terminal line disciplines, Pseudo-Terminals, Terminal modes, rlogin, Overview; RPC: Introduction, Transparency Issues.

TEXT BOOKS:

1. W.RichardStevens, *UNIX Network Programming, Vol. I, Sockets API*. PearsonEdn Asia, 2nd Ed..
2. W.RichardStevens, *UNIX Network Programming*. PHI, 1st Ed.

REFERENCE BOOKS:

1. T Chan, *UNIX Systems Programming using C++*. PHI.
2. Graham Glass, King Abla, *UNIX for Programmers and Users*. Pearson Education, 3rd Ed.
3. M. J. Rochkind, *Advanced UNIX Programming*. Pearson Education, 2nd Ed.

IV Year B.Tech. CSE-I Semester

(1G472) MOBILE COMMUNICATIONS
(ELECTIVE II)

UNIT I INTRODUCTION TO MOBILE COMMUNICATIONS AND COMPUTING: Mobile Computing (MC): Introduction to MC, Novel applications, limitations and architecture.

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

UNIT II (WIRELESS) MEDIUM ACCESS CONTROL: Motivation of a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT III MOBILE NETWORK LAYER: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

UNIT IV MOBILE TRANSPORT LAYER: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission/time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT V MOBILE ADHOC NETWORKS (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

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

UNIT VII DATABASE ISSUES: Hoarding techniques, caching invalidation mechanisms, client server computing with adaption, power-aware and context-aware computing, transactional models, query processing, recovery and quality of service issues.

UNIT VIII DATA DISSEMINATION: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques

TEXT BOOKS:

1. Jochen Schiller, *Mobile Communications*. Addison Wesley (Chapters 4, 7, 9, 10, 11), 2004, 2nd Ed.
2. Raj Kamal, *Mobile Computing*. Oxford University Press (Contents 1, 3, 4, 5, 6, 7, 8, 1).

REFERENCE BOOKS:

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

IV Year B.Tech. CSE-I Semester

(1G179) CASE TOOLS AND DATA MINING LAB

Part – A (Case Tools):

1. The student should take up the case study of Unified Library application which is mentioned in the theory, and Model it in different views i.e. Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

2. Student has to take up another case study of his/her own interest and do the same whatever mentioned in first problem. Some of the ideas regarding case studies are given in reference books which were mentioned in theory syllabus can be referred for some idea.

Note: The analysis, design, coding, documentation, database design of mini project which will be carried out in 4th year should be done in object-oriented approach using UML and by using appropriate software which supports UML, otherwise the mini project will not be evaluated.

Part-B (Data Mining):

CREDIT RISK ASSESSMENT

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.

4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data: Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data (Download from web).

In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer!)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).
- owns telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- Foreign worker. There are millions of these in Germany (many from Turkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into one of two categories, good or bad.

Subtasks : (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.
2. What attributes do you think might be crucial in making the credit assessment ? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?
5. Is testing on the training set as you did above a good idea? Why or Why not?
6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what is cross-validation briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why?
7. Check to see if the data shows a bias against "foreign workers" (attribute 20), or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case

which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.

8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the ARFF data file to get all the attributes initially before you start selecting the ones you want.)
9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?
10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

Task Resources:

Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:
 - Introduction to Weka (html version) (download ppt version)
 - Download Weka
 - Weka Tutorial
 - ARFF format
 - Using Weka from command line

IV Year B.Tech. CSE-I Semester

(1G17A) WEB TECHNOLOGIES LAB

Objective :

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

Hardware and Software required :

1. A working computer system with either Windows or Linux
2. A web browser either IE or firefox
3. Apache web server or xampp and wamp bundle servers
4. A database either Mysql or Oracle

Week-1:

- 1) Installation of apache webserver
- 2) Installation of XAMPP Bundle Server
- 3) Installation of WAMP Bundle Server

Week-2:

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

1) HOME PAGE:

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

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

Left frame: At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link “CSE” the catalogue for CSE Books should be displayed in the Right frame.

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

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

Fig 1.1

2) LOGIN PAGE:

This page looks like below:



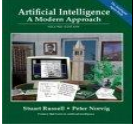





Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Login : <input type="text"/> Password: <input type="text"/> <input type="button" value="Submit"/> <input type="button" value="Reset"/>			

3) CATOLOGUE PAGE:

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

The details should contain the following:

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

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE		Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	
ECE				
EEE				
CIVIL		Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	
		Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	
		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	

Note: Week 3 contains the remaining pages and their description.

Week-3:

4) CART PAGE:

The cart page contains the details about the books which are added to the cart.

The cart page should look like this:

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

5) REGISTRATION PAGE:

Create a “*registration form*” with the following fields

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

WEEK 4:

VALIDATION:

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

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

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

Week-5:

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

1) Use different font, styles:

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

For example:

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

</HEAD>

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

For example:

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

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

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

</HTML>
```

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

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

3) Control the repetition of the image with the background-repeat property.

As background-repeat: repeat

Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

4) Define styles for links as

A:link

A:visited

A:active

A:hover

Example:

```
<style type="text/css">
```

```
A:link {text-decoration: none}
```

```
A:visited {text-decoration: none}
```

```
A:active {text-decoration: none}
```

```
A:hover {text-decoration: underline, color: red,}
```

```
</style>
```

5) Work with layers:

For example:

LAYER 1 ON TOP:

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

```
index:1">LAYER 2</div>
```

LAYER 2 ON TOP:

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

```
index:4">LAYER 2</div>
```

6) Add a customized cursor:

Selector {cursor:value}

For example:

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

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

Week-6:

1) Install IIS web server or APACHE.

While installation assign port number 4040 to IIS and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.

Access the pages by using the urls : <http://localhost:4040/rama/books.html> (for tomcat) <http://localhost:8080/books.html> (for Apache)

Week-7: User Authentication:

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

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

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display "You are not an authenticated user" Use init-parameters to do this.

Week-8: Install a database (Mysql or Oracle).

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

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

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

Week-9:

Write a PHP which does the following job:

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

Week-10:

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

Week-11:

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

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

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

IV Year B.Tech. CSE-II Semester

(1G181) ARTIFICIAL NEURAL NETWORKS

UNIT I BASICS OF ARTIFICIAL NEURAL NETWORKS: Introduction, Characteristics of Neural Networks, Historical development of Neural Network Principles, Artificial Neural Networks: Terminology, Models of Neuron, Topology, Basic Learning Laws.

UNIT II ACTIVATION AND SYNAPTIC DYNAMICS: Introduction, Activation dynamics models, Synaptic dynamics models, Learning methods, Stability and Convergence, Recall in Neural Networks.

UNIT III FUNCTIONAL UNITS OF ANN FOR PATTERN RECOGNITION TASKS: Pattern recognition problem, Basic functional units, Pattern recognition tasks by the functional units.

UNIT IV FEED FORWARD NEURAL NETWORKS: Introduction, Analysis of pattern association networks, Analysis of pattern classification networks, Analysis of pattern mapping networks.

UNIT V: FEEDBACK NEURAL NETWORKS: Introduction, Analysis of linear autoassociative FF networks, Analysis of pattern storage networks, Stochastic networks and simulated annealing, Boltzman machine.

UNIT VI: COMPETITIVE LEARNING NEURAL NETWORKS: Introduction, Components of a competitive learning networks, Analysis of feedback layer for different output functions, Analysis of pattern clustering networks, Analysis of feature mapping networks.

UNIT VII: ARCHITECTURES FOR COMPLEX PATTERN RECOGNITION TASKS: Introduction, Associative memory, pattern mapping, Stability-Plasticity dilemma: ART, Temporal patterns, Pattern variability: Neo cognition.

UNIT VIII: APPLICATION OF ANN: Introduction, Direct applications, Application areas.

TEXT BOOKS:

1. B.Yegnanarayana, *Artificial Neural Networks*. PHI.
2. Haykins, *Neural Networks*. 2003, PEA, 1st Ed.

REFERENCE BOOKS:

1. Sateesh Kumar, *Neural Networks: A Class Room Approach*. TMH, 2005.
2. I.Alexander, HeienMarton, *An Introduction to Neural Computing*. Thomson.
3. Anderson, *Introduction to Neural Networks*. PHI.
4. Rajasekhara, *Neural Networks, Fuzzy Logic and General Algorithms*. PHI.
5. AnandaRao, Srinivas, *Neural Networks*. Narosa, 2003.

IV Year B.Tech. CSE-II Semester

(1G182) DESIGN PATTERNS

UNIT I INTRODUCTION: Architectural to Software Design Patterns, What Is a Design Pattern? More about Design Patterns, design patterns to solve design problems, selecting a design pattern, Use of a design pattern

UNIT II BASIC PATTERNS: Interface, Abstract Parent Class, Private Methods, Accessor Methods, Constant Data Manager, Immutable Object, Monitor

UNIT III CREATIONAL PATTERNS: Factory Method, Singleton, Abstract Factory, Prototype, Builder

UNIT IV COLLECTION PATTERNS: Composite, Iterator, Flyweight, Visitor

UNIT V STRUCTURAL PATTERNS: Decorator, Adapter, Chain of Responsibility, Facade, Proxy, Bridge, Virtual Proxy, Counting Proxy, Aggregate Enforcer, Explicit Object Release, Object Cache

UNIT VI BEHAVIORAL PATTERNS-1: Command, Mediator, Memento, Observer, Interpreter, State, Strategy, Null Object

UNIT VII BEHAVIORAL PATTERNS-2: Template Method, Object Authenticator, Common Attribute Registry

UNIT VIII CONCURRENCY PATTERNS: Critical Section, Consistent Lock Order, Guarded Suspension, Read-Write Lock

TEXT BOOKS:

1. ParthaKuchana, *Software Architecture Design Patterns in Java*.
2. Erich Gamma, Richard Helm et al. *Design Patterns: Elements of Reusable Object-Oriented Software*. PEA.

REFERENCE BOOKS:

1. Luke Hohmann, *Beyond Software architecture*. Addison Wesley, 2003.
2. David M. Dikel, David Kane and James R. Wilson, *Software architecture*. Prentice Hall PTR, 2001.
3. F. Buschmann & others, *Pattern Oriented Software Architecture*. John Wiley & Sons.
4. Eric Freeman & Elisabeth Freeman, *Head First Design patterns*. O'Reilly, 2007.
5. Steven John Metsker & William C. Wake, *Design Patterns in Java*. Pearson education, 2006.
6. Deepak Alur, John Crupi & Dan Malks, *J2EE Patterns*. Pearson education, 2003.
7. Steven John metsker, *Design Patterns in C#*, Pearson education, 2004.
8. David Budgen, *Software Design*. Pearson education, 2003, 2nd Ed.

IV Year B.Tech. CSE-II Semester

(1G388) VLSI DESIGN
(ELECTIVE III)

UNIT I INTRODUCTION: Introduction to IC technology-MOS, PMOS, NMOS, CMOS and BI-CMOS technologies-oxidation, lithiography, diffusion, Ion implantation, metallisation, Encapsulation, probe testing, integrated resistors and capacitors.

UNIT II BASIC ELECTRICAL PROPERTIES: Basic electrical properties of MOS and BI-CMOS circuits: I_{ds} - V_{ds} relationships, MOS transistor threshold voltage, g_m , g_{ds} , figure of merit; pass transistor, NMOS inverter, various pull-ups, CMOS inverter analysis and design, BI-CMOS inverters.

UNIT III VLSI CIRCUIT DESIGN PROCESSES: VLSI design flow, MOS layers, stick diagrams, design rules and lay out, 2 m CMOS design rules for wires, contacts and transistors layout diagrams for NMOS and CMOS inverters and gates, scaling of MOS circuits, limitations of scaling.

UNIT IV GATE LEVEL DESIGN: Logic gates and other complex gates, switch logic, alternate gate circuits, basic circuit concepts, sheet resistance R_S and its concept to MOS, area capacitance units, calculations-(Micro)-delays, driving large capacitive loads, wiring capacitances, fan-in and fan-out, choice of layers.

UNIT V SUB SYSTEM DESIGN: Sub system design, shifters, adders, ALUs, multipliers, parity generators, comparators, zero/one detectors, counters, high density memory elements.

UNIT VI SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN: PLAs, FPGAs, CPLDs, standard cells, programmable array logic, design approach.

UNIT VII VHDL SYNTHESIS: VHDL synthesis, circuit design flow, circuit synthesis, simulation, layout, design capture tools, design verification tools, test principles.

UNIT VIII CMOS TESTING: CMOS testing need for testing, test principles, design strategies for test, chip level test techniques, system-level test techniques, layout design for improved testability.

TEXT BOOKS:

1. Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, *Essentials of VLSI circuits and systems*. PHI, 2005 Edition.

2. Weste and EShraghian, *Principles of CMOS VLSI design*. Pearson Education, 1999.

REFERENCE BOOKS:

1. John P.Uyemura, *Introduction to VLSI circuits and systems*. John Wiley, 2003.
2. John M. Rabaey, *Digital Integrated circuits*. PHI, EEE, 1997.

IV Year B.Tech. CSE-II Semester

**(1G183) IMAGE PROCESSING
(ELECTIVE III)**

UNIT I INTRODUCTION: Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system.. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels (p.nos. 15-17, 21- 44, 50-69).

UNIT II IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN: Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods (p.nos 76-141).

UNIT III IMAGE RESTORATION: A model of the image degradation/restoration process, noise models, restoration in the presence of noise–only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function (p.nos 147-167, 220-243, 256-276).

UNIT IV COLOR IMAGE PROCESSING: Color fundamentals, color models, pseudo color image processing, basics of full–color image processing, color transforms, smoothing and sharpening, color segmentation (p.nos: 282- 339).

UNIT V IMAGE COMPRESSION: Fundamentals, image compression models, error-free compression, lossypredictive coding, image compression standards (p.nos: 409-467,492-510).

UNIT VI MORPHOLOGICAL IMAGE PROCESSING: Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms (p.nos:519-550).

UNIT VII IMAGE SEGMENTATION: Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation (p.nos: 567-617).

UNIT VIII OBJECT RECOGNITION: Patterns and patterns classes, recognition based on decision–theoretic methods, matching, optimum statistical classifiers, neural networks, structural methods – matching shape numbers, string matching (p.nos: 693-735).

TEXT BOOK:

1. RafealC.Gonzalez, Richard E.Woods, *Digital Image Processing*. Pearson Education/PHI, 2nd Ed.

REFERENCE BOOKS:

1. Milan Sonka, Vaclav Hlavac and Roger Boyle, *Image Processing, Analysis, and Machine Vision*. Thomson Learning, 2nd Ed.
2. Alasdair McAndrew, *Introduction to Digital Image Processing with Matlab*. Thomson Course Technology.
3. Adrian Low, *Computer Vision and Image Processing*, B.S.Publications, 2nd Ed.
4. William K. Prat, *Digital Image Processing*. Wiley 3rd Ed.
5. B. Chanda, D. Datta Majumder, *Digital Image Processing and Analysis*. Prentice Hall of India, 2003.

IV Year B.Tech. CSE-II Semester

**(1G184) VIRTUAL REALITY
(ELECTIVE III)**

UNIT I INTRODUCTION: The three I's of virtual reality, commercial VR technology and the five classic components of a VR system. (1.1, 1.3 and 1.5 of Text Book (1))

UNIT II INPUT DEVICES: (Trackers, Navigation, and Gesture Interfaces): Three-dimensional position trackers, navigation and manipulation, interfaces and gesture interfaces. (2.1, 2.2 and 2.3 of Text Book (1)).

UNIT III OUTPUT DEVICES: Graphics displays, sound displays & haptic feedback. (3.1,3.2& 3.3 of Text Book (1))

UNIT IV MODELING: Geometric modeling, kinematics modeling, physical modeling, behaviour modeling, model management. (5.1, 5.2 and 5.3, 5.4 and 5.5 of Text Book (1)).

UNIT V HUMAN FACTORS: Methodology and terminology, user performance studies, VR health and safety issues. (7.1, 7.2 and 7.3 of Text Book (1)).

UNIT VI APPLICATIONS: Medical applications, military applications, robotics applications. (8.1, 8.3 and 9.2 of TextBook (1)).

UNIT VII VR PROGRAMMING-I: Introducing Java 3D, loading and manipulating external models, using a lathe to make shapes. (Chapters 14, 16 and 17 of Text Book (2))

UNIT VIII VR PROGRAMMING-II: 3D Sprites, animated 3D sprites, particle systems. (Chapters 18, 19 and 21 of Text Book (2))

TEXT BOOKS:

1. Gregory C. Burdea & Philippe Coiffet, *Virtual Reality Technology*. John Wiley & Sons Inc., 2nd Ed.
2. Andrew Davison, *Killer Game Programming in Java*. O'Reilly-SPD, 2005.

REFERENCE BOOKS:

1. William R.Sherman, Alan Craig, *Understanding Virtual Reality, interface,*

- Application and Design*. Elsevier (Morgan Kaufmann).
2. Bill Fleming, *3D Modeling and surfacing*. Elsevier (Morgan Kauffman).
 3. David H.Eberly, *3D Game Engine Design*. Elsevier.
 4. John Vince, *Virtual Reality Systems*. Pearson Education.

IV Year B.Tech. CSE-II Semester

**(1G185) HUMAN COMPUTER INTERACTION
(ELECTIVE IV)**

UNIT I INTRODUCTION: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.

UNIT II THE GRAPHICAL USER INTERFACE: popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT III DESIGN PROCESS: Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT IV SCREEN DESIGNING: Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT V WINDOWS: New and Navigation schemes selection of window, selection of devices based and screen based controls.

UNITVI COMPONENTS: Text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT VII SOFTWARE TOOLS: Specification methods, interface – Building Tools.

UNIT VIII INTERACTION DEVICES: Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

TEXT BOOKS:

1. Wilbert O Galitz, *The essential guide to user interface design*. Wiley DreamTech.
2. Ben Shneidermann, *Designing the user interface*. Pearson Education Asia, 3rd Ed.

REFERENCE BOOKS:

1. Alan Dix, Janet Finckay, Gregory Abowd, Russell Beaulieu, *Human, Computer Interaction*. Pearson Education
2. Prece, Rogers, and Sharp, *Interaction Design* Wiley Dreamtech.
3. Soren Lauesen, *User Interface Design*. Pearson Education.

IV Year B.Tech. CSE-II Semester

**(1G186) SERVICE ORIENTED ARCHITECTURE
(ELECTIVE IV)**

UNIT I INTRODUCTION TO SOA: Evolution of SOA: Fundamental SOA, Common Characteristics of contemporary SOA, Benefits of SOA, A SOA timeline(from XML to Web Services to SOA), The continuing evolution of SOA (Standards organizations and Contributing vendors), The roots of SOA(comparing SOA to Past architectures).

UNIT II PRINCIPLES OF SERVICE: Orientation: Services-orientation and the enterprise, Anatomy of a service-oriented architecture, Common Principles of Service-orientation, Service orientation and Object-orientation, Service layer abstraction, Business service layer, Orchestration service layer.

UNIT III WEB SERVICES AND SOA: The Web services framework, Services (as Web Services), Service Registry, Service descriptions (with WSDL), Messaging (with SOAP), Transactions, Coordination, Business Activity, Orchestration, Choreography.

UNIT IV: Addressing, Reliable Messaging, Policies, Metadata, Security, Notification and Events, Semantic Web Services, RESTful Services.

UNIT V BUSINESS PROCESS DESIGN: Business Process Management basics, WS-BPEL language basics, WS-Coordination overview, Service oriented business process design.

UNIT VI: WS-addressing language basics, WS-Reliable Messaging language basics, Service Component Architecture basics.

UNIT VII: ENTERPRISE PLATFORMS AND SOA: SOA platform basics, Enterprise Service Bus basics (including basic and complex patterns).

UNIT VIII: SOA support in J2EE, SOA support in .NET, SOA Reference Architecture.

TEXT BOOKS:

1. Thomas Erl, *Service-Oriented Architecture Concepts and Technology and Design*. Pearson Education, 2005.

REFERENCE BOOKS:

1. Chris Britton, *IT Architecture and Middleware, Strategies for Building Large Integrated Systems*. ISBN 0-201-70907-4.
2. Eric Newcomer, Greg Lomow, *Understanding SOA with Web Services*. Pearson Education, 2005.
3. Sandeep Chatterjee, James Webber, *Developing Enterprise Web Services: An Architect's Guide*. Pearson Education, ISBN 81-297-0491-9.

IV Year B.Tech. CSE-II Semester

**(1G187) SOFTWARE TESTING METHODOLOGIES
(Elective IV)**

UNIT I INTRODUCTION: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

UNIT II FLOW GRAPHS AND PATH TESTING: Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT III TRANSACTION FLOW TESTING: Transaction flows, transaction flow testing techniques.

Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT IV DOMAIN TESTING: domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT V PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS: Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

UNIT VI LOGIC BASED TESTING: Overview, decision tables, path expressions, kv charts, specifications.

UNIT VII STATE, STATE GRAPHS AND TRANSITION TESTING: State graphs, good & bad state graphs, state testing, Testability tips.

UNIT VIII GRAPH MATRICES AND APPLICATION: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. Usage of JMeter and Winrunner tools for functional / Regression testing.

TEXT BOOKS:

1. BarisBeizer, *Software Testing techniques*. Dreamtech, 2nd Ed.

REFERENCE BOOKS:

1. Dr.K.V.K.K.Prasad, *Software Testing Tools*. Dreamtech.
2. Brian Marick, *The craft of software testing*. Pearson Education.
3. *Software Testing Techniques* – SPD(O'Reilly).
4. Edward Kit. *Software Testing in the Real World*. Pearson.
5. Perry, *Effective methods of Software Testing*, John Wiley.
6. Meyers, *Art of Software Testing*, John Wiley.