

ACADEMIC REGULATIONS PROGRAM STRUCTURE & DETAILED SYLLABUS

Bachelor of Technology (Computer Science and Engineering)

(Effective for the students admitted from the Academic Year 2011-12)



**GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY**

‘A’ Grade Accreditation by NAAC
(Autonomous under JNTU Hyderabad)



Bachelor of Technology (B.Tech) degree of Jawaharlal Nehru Technological University Hyderabad (JNTUH) shall be conferred on a candidate who is admitted to the programme and fulfils all the requirements for the award of the degree.

Academic Regulations GR11 for B.Tech (Regular)

(Effective for the students admitted into 1 year from the Academic Year 2011-12)

1. Admissions

Admission to the B.Tech programme shall be made subject to the eligibility and qualifications prescribed by the University from time to time. Admissions shall be made either on the basis of the merit rank obtained by the qualifying candidate at EAMCET conducted by APSCHE or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the Government from time to time.

2. Award of Degree

A student will be declared eligible for the award of the B. Tech. Degree if he/She fulfils the following academic requirements:

- (a) Pursued a course of study for not less than four academic years and not more than eight academic years.
- (b) Registered for 200 credits and secured 200 credits. The marks obtained in all 200 credits shall be considered for the calculation of the final percentage of marks.
- (c) Students, who fail to fulfil all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course.

3. Courses of study

- (a) Courses offered
The following courses of study are offered at present for specializations for B. Tech.
- (b) There shall be no branch transfer after the completion of admission procedures.

4. Medium of Instruction

The medium of instruction (including examinations and reports) shall be English.



Branch No.	Branch (Code)
01	Civil Engineering (CE)
02	Electrical and Electronics Engineering (EEE)
03	Mechanical Engineering (ME)
04	Electronics and Communication Engineering (ECE)
05	Computer Science and Engineering (CSE)
11	Biomedical Engineering (BME)
12	Information Technology (IT)
23	Biotechnology Engineering (BT)

5. Course Pattern

- Each Academic year of study (I, II, III and IV Years) is divided into two semesters.
- Minimum number of instruction days in each semester is 90.

6.Attendance Requirements

- A student shall be eligible to appear for the end semester examinations if he/ she acquire a minimum of 75% of attendance in aggregate of all the subjects in the semester.
- Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a semester may be granted based on medical grounds with sufficient medical proof. A committee headed by Dean (Academic Affairs) shall be the deciding authority for granting the condonation
- Students who have been granted condonation shall pay a fee as decided by the Academic Council.
- Shortage of Attendance below 65% in aggregate shall in NO case be condoned.
- Students whose shortage of attendance is not condoned in any semester are detained and are not eligible to take their end examination of that semester. They may seek re-registration for that semester when offered next with the academic regulations of the batch into which he/she gets re-admitted.

7. Paper setting, Evaluation of Answer Scripts, Marks and Assessment

- (a) The following is the maximum marks distribution for the subjects.

	End exams (External)	Internal	Total
Theory	75	25	100
Practical	50	25	75
Drawing	75	25	100
Industrial Mini Project	50	25	75
Comprehensive Viva	100	-	100
Seminar	-	50	50
Project	150	50	200

- (b) Paper setting and Evaluation of the Answer Scripts shall be done as per the procedures laid down by the Academic Council from time to time.
- (c) For internal evaluation in theory subjects, there shall be 2 mid-term examinations during the semester. Each mid-term examination consists of an objective paper for 10 marks (20 questions) and subjective paper for 15 marks (three out of four questions) with total duration of 110 minutes (20 minutes for objective and 90 minutes for subjective paper). Objective paper shall be set with multiple choice questions, true/false, fill-in the blanks, matching type questions, etc. The total marks secured by the student in each mid-term examination for 25 marks is considered and the better of the two mid-term examinations shall be taken as the final marks secured by each candidate as internal marks for the subject.

(d) For internal evaluation in Practical's

- (i) Laboratory (including English laboratory): Marks: 25.
Day-to-day work in the laboratory: **15 marks**.

Two internal tests: Each of **10 marks** (conducted by the concerned laboratory Faculty members). The **better of the two** internal tests shall be considered for the award of marks.

The end examination shall be conducted at the end of the semester with the laboratory Faculty as internal examiner and an external examiner as appointed by the Controller of Examinations.

- (ii) **Engineering Graphics: 25 marks**
 Day-to-day work: 15 marks.



Two internal tests: Each of 10 marks. The better of the two Internal tests shall be considered for the award of marks.

(e) End Semester examinations

This examination shall be set to 75 marks with time duration of 3 hours. The pattern of the examination paper shall be as per the guidelines of the Academic Council.

(f) (i) Industrial Mini Project

Industrial Mini Project is to be taken up in collaboration with Industry during III year. At the end of the semester, Mini Project shall be displayed as a road show at the department level for the benefit of all students and staff. The same is to be evaluated by an internal committee of HOD, Supervisor and senior faculty member for 10 marks. The supervisor continuously assesses the student for 15 marks, ensuring that each student puts in effort equivalent of at least 80 periods. The mini project shall be submitted in a report form and should be presented before a committee consisting of an External Examiner, Head of Department, Supervisor and a senior faculty member. The report along with the presentation for 50 marks.

(ii) Comprehensive Viva

The comprehensive Viva shall be held in IV year II semester. The Viva shall be conducted by a Committee consisting of HOD and two senior faculty members of the department. The student shall be assessed for his/her understanding of various subjects studied during the course of study. The Viva shall be evaluated for 100 marks.

(iii) Seminar

The seminar presentation shall be held in IV year II semester. For the seminar, the student shall collect information on a specialized Topic and prepare a technical report and submit to the department. The student's seminar shall be evaluated by a Committee consisting of HOD, seminar supervisor and a senior faculty member of the department. The student shall be assessed for his/her understanding of the topic, its application and its relation with various subjects studied during the course of study. The seminar shall be evaluated for 50 marks.

(g) Project

Out of 200 marks for the project work, 50 marks shall be for internal evaluation and 150 marks for the End Semester Examination. A Report (in the form required by the Department) shall be submitted by the student before the date announced by the HOD. The End Semester Examination on the project submitted is a Viva voce examination



conducted by the same Committee appointed for Industrial mini project. In addition, the Project supervisor shall also be a member of the Committee. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of the project work shall be done at the end of IV year. The Internal Evaluation shall be based on the two seminars given by each student on the topic of his/ her project.

8. **Recounting of marks in the end examination answer books**

A student can request for re-counting of his/her answer book on payment of a prescribed fee.

9. **Re-evaluation of the answer books**

A student can request for re-evaluation of his/her answer book on payment of a prescribed fee.

10. **Supplementary examinations**

A student who has failed in an End semester examination can appear in a supplementary examination, the schedule of which shall be announced by the Institute separately. The student has to clear all the backlog papers within the stipulated time of eight years.

11. **Malpractices in Examinations**

Disciplinary action shall be taken in case of malpractices during mid/ End examinations as per the rules framed by the Academic Council.

12. **Academic Requirements**

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in Para 6.

- (a) A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or laboratories, if he/ she secures **not less than 35%** (26 out of 75 or 17 out of 50) 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.
- (b) A student shall be promoted from II year to III year; or from III year to IV year only if he/ she fulfils the academic requirement of minimum credits from the following examinations whether the candidate takes the examination or not.



Phase	Minimum Credits	No. of Examinations				
		I-I	I-II	II-I	II-II	III-I
II to III Year	37	2 Regular 1 Supply	1 Regular 1 Supply	1 Regular —	— —	— —
III to IV Year	62	3 Regular 2 Supply	2 Regular 2 Supply	2 Regular 1 Supply	1 Regular 1 Supply	1 Regular

13. Award of Degree or Class

After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B.Tech Degree by JNTUH, he/she shall be placed in one of the following four classes (the marks awarded are from the aggregate marks secured for the 200 credits):

Class Awarded	% of Marks Secured
FIRST CLASS with DISTINCTION	Marks \geq 70%
FIRST CLASS	$60\% \leq$ Marks $< 70\%$
SECOND CLASS	$50\% \leq$ Marks $< 60\%$
PASS CLASS	$40\% \leq$ Marks $< 50\%$

14. Withholding of results

The result of a student shall be withheld if (i) he/ she is involved in malpractices and is not cleared of the malpractice, (ii) disciplinary proceedings are pending against him/ her, or for any other reason approved by the Academic Council.

15. Transfer of students from the Constituent Colleges of JNTUH or from other Colleges/ Universities

Transfer of students from the Constituent Colleges of JNTUH or from other Colleges/ Universities shall be considered only on case-to-case basis by the Academic Council of the Institute.

16. Transitory Regulations

Students who have discontinued or have been detained for want of attendance, or who have failed after having undergone the Degree Program, may be considered eligible for readmission to the same or equivalent subjects as and when they are offered.



17. General Rules

- (a) The academic regulations should be read as a whole for the purpose of any interpretation.
- (b) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.
- (c) In case of any error in the above rules and regulations, the decision of the Academic Council is final.
- (d) The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College.



Academic Regulations GR11 for B.Tech (Lateral Entry)

(Effective for the students admitted into II year from the Academic Year 2011-12)

1. All regulations as applicable for B.Tech. Four year degree programme (Regular) will hold good for B.Tech. (Lateral Entry Scheme) except for the following rules:
 - (a) Pursued a programme of study for not less than three academic years and not more than six academic years (para 2(a)).
 - (b) Registered for 150 credits and secured 150 credits. The marks obtained in all 150 credits shall be considered for the calculation of the final percentage of marks(para 2(b)).
 - (c) Students, who fail to fulfil all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech programme (para 2(c)).

2. Academic Requirements

A student shall be promoted from III year to IV year only if he/ she fulfils the academic requirement of minimum credits from the following examinations whether the candidate takes the examination or not. (para 12(b)).

Phase	Minimum Credits	No. of Examinations		
		II-I	II-II	III-I
III to IV Year	37	2 Regular 1 Supply	1 Regular 1 Supply	1 Regular —

3. Award of Degree or Class

After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of B.Tech Degree by JNTUH, he/ she shall be placed in one of the following four classes (the marks awarded are from the aggregate marks secured for the 150 credits)(para 13):

Class Awarded	% of Marks Secured
FIRST CLASS WITH DISTINCTION	Marks \geq 70%
FIRST CLASS	60% \leq Marks < 70%
SECOND CLASS	50% \leq Marks < 60%
PASS CLASS	40% \leq Marks < 50%



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
B.Tech (CSE) PROGRAMME STRUCTURE

I B.Tech (CSE)**I Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
BAS	GR11A1001	Mathematics-I	4	1		4	100	25	75
EAS	GR11A1003	Computer Programming & Data Structures	4	1		4	100	25	75
BAS	GR11A1004	Engineering Physics	4	1		3	100	25	75
EAS	GR11A1005	Basic Electrical and Electronics Eng	4	1		3	100	25	75
HSS	GR11A1002	English	4	1		3	100	25	75
EAS	GR11A1006	Computer Programming and Data Structures Lab			6	3	75	25	50
BAS	GR11A1007	Engineering Physics Lab			3	3	75	25	50
EAS	GR11A1008	Engineering Work Shop			3	2	75	25	50
		Total	17	5	12	25	725	200	525

I B.Tech (CSE)**II Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
BAS	GR11A1010	Mathematics-II	4	1		4	100	25	75
BAS	RG11A1018	Mathematics-III	4	1		4	100	25	75
BAS	GR11A1011	Engineering Chemistry	3	1		3	100	25	75
EAS	GR11A1009	Environmental Science	3	1		3	100	25	75
EAS	GR11A1012	Engineering Graphics	3		4	3	100	25	75
EAS	GR11A1013	IT Workshop			3	2	75	25	50
BAS	GR11A1014	Engineering Chemistry Lab			3	3	75	25	50
HSS	GR11A1015	English Lab			3	3	75	25	50
		Total	17	4	13	25	725	200	525

**II B.Tech (CSE)****I Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
DC	GR11A2056	Mathematical Foundations of Com Science	4	1		4	100	25	75
DC	GR11A2075	Data Structures Through C ++	4	1		4	100	25	75
DC	GR11A2076	Database Management Systems	4	1		4	100	25	75
IE	GR11A2077	Digital Logic Design	3	1		3	100	25	75
DC	GR11A2052	Object Oriented Programming through Java	4	1		4	100	25	75
DC	GR11A2078	Data Structures Through C ++ Lab			3	2	75	25	50
DC	GR11A2055	Object Oriented Programming through Java Lab			3	2	75	25	50
DC	GR11A2079	Database Management Systems Lab			3	2	75	25	50
		Total	19	5	9	25	725	200	525

II B.Tech (CSE)**II Semester**

Group	Sub-Code	Subject	L	T	P	Credits	Marks	Int	Ext
DC	GR11A2081	Computer Organization	4	1		4	100	25	75
DC	GR11A2083	Operating Systems	4	1		4	100	25	75
BAS	GR11A2010	Probability & Statistics	4	1		4	100	25	75
DC	GR11A2057	Formal Languages & Automata Theory	3	1		3	100	25	75
DC	GR11A2082	Design & Analysis of Algorithms	4	1		4	100	25	75
DC	GR11A2102	Operating Systems and UNIX Internals Lab			3	2	75	25	50
DC	GR11A2061	Scripting Languages Lab			3	2	75	25	50
DC	GR11A2059	Design and Analysis of Algorithms Lab			3	2	75	25	50
		Total	19	5	9	25	725	200	525

**III B.Tech (CSE)****I Semester**

Group	Sub-Code	Subject	L	T	P	C	M	Int	Ext
DC	GR11A3022	Compiler Design	4	1		4	100	25	75
DC	GR11A3027	Computer Networks	4	1		4	100	25	75
DC	GR11A3004	Advanced Unix Pro	4	1		4	100	25	75
IE	GR11A2050	Micro Controllers	3	1		3	100	25	75
HSS	GR11A2071	Managerial Economics & Financial Analysis	4	1		4	100	25	75
DC	GR11A3023	Compiler Design Lab			3	2	75	25	75
DC	GR11A3005	Advanced Unix Programming Lab			3	2	75	25	75
IE	GR11A2054	Microcontrollers Lab			3	2	75	25	75
		Total	19	5	9	25	725	200	525

III B.Tech (CSE)**II Semester**

Group	Sub-Code	Subject	L	T	P	C	M	Int	Ext
DC	GR11A3065	Information Security	4	1		4	100	25	75
DC	GR11A2084	Software Engineering	3	1		3	100	25	75
HSS	GR11A306	Management Science	4	1		4	100	25	75
DC	GR11A3032	Data warehousing and Data Mining	4	1		4	100	25	75
DE		Open Elective Multi-core computers	4	1		4	100	25	75
	GR11A3075	Architecture & Program							
	GR11A3007	Artificial Intelligence & Neural Networks							
	GR11A3084	Principles of Programming Languages							
DC	GR11A3034	Data warehousing & Data Mining/ Information Security Lab			3	2	75	25	75
DC	GR11A2073	Advanced English Communication Skills Lab			3	2	75	25	75
PW	GR11A3064	Industry Oriented Mini Pro			3	2	75	25	75
		Total	19	5	9	25	725	200	525

**IV B.Tech (CSE)****I Semester**

Group	Sub-Code	Subject	L	T	P	C	M	Int	Ext
DC	GR11A3047	Embedded Systems	4	1		4	100	25	75
DC	GR11A2058	Object Oriented Analysis and Design	4	1		4	100	25	75
DC	GR11A3099	Web Technologies	3	1		3	100	25	75
DE		Elective - 1	4	1		4	100	25	75
	GR11A4045	Geographical Information Systems							
	GR11A4075	Natural Language Processing							
	GR11A4068	Mobile Computing							
DE		Elective - 2	4	1		4	100	25	75
	GR11A4053	Image Processing & Pattern							
	GR11A4113	Recognition							
	GR11A3044	Software Testing Methodologies Distributed Databases							
DC	GR11A2060	Object Oriented Analysis and Design Lab			3	2	75	25	75
DC	GR11A3100	Web Technologies Lab			3	2	75	25	75
DC	GR11A4038	Embedded Systems Lab			3	2	75	25	75
		Total	19	5	9	25	725	200	525

IV B.Tech (CSE)**II Semester**

Group	Sub-Code	Subject	L	T	P	C	M	Int	Ext
DC	GR11A4076	Network Programming	3	1		3	100	25	75
DE		Elective - 3	3	1		3	100	25	75
	GR11A4112	Software Project Management							
	GR11A4054	Information Retrieval Systems							
	GR11A4066	Mobile Application Development							
DE		Elective - 4	3	1		3	100	25	75
	GR11A4052	Human Computer Interaction							
	GR11A4024	Design Patterns							
	GR11A4017	Cloud Computing							
DC	GR11A4077	Network Programming Lab				3	2	75	25
DC	GR11A4110	Seminar				3	2	50	
DC	GR11A4018	Comprehensive Viva				3	2	100	
PW		Major Project					15	200	40
		Total	9	3	9	25	725	140	435





I-Year





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I B.Tech (CSE)**I Semester**

MATHEMATICS - I

OBJECTIVES: Mathematics is the backbone of all Engineering disciplines. Mathematics - I is common to All Branches except BT. Mathematics - I provides all the basic requirements for application of Mathematics to the Engineers. At the end of the course, the students will be able to apply the concepts of (i) Integration over two and three dimensions, (ii) Vector fields and Vector integration theorems, (iii) Matrix theory, in their fields of study.

L: 4, T: 1, Credits: 4**Total Marks: 100 (Int: 25, Ext: 75)****UNIT-I**

Matrices: Real matrices - Symmetric, skew-symmetric, orthogonal matrices. Complex matrices: Hermitian, skew-Hermitian, Unitary matrices. Elementary row transformations, rank, echelon form, normal form. Solution of linear systems: Consistency and inconsistency of a system of equations.

Eigen values and eigen vectors: Eigen values and eigen vectors of a matrix and their properties. Modal and spectral matrices. Condition number of a matrix. Cayley-Hamilton theorem (without proof) and its application to find the inverse and powers of a matrix. Diagonalisation of a matrix.

Eigen values and eigenvectors of complex matrices and their properties.

UNIT-II

Linear Transformations and quadratic forms: Linear transformation: Orthogonal transformation. Singular value decomposition of a matrix. Quadratic forms: Definition, positive definite, negative definite, indefinite, semi-definite quadratic forms. Rank, index and signature of a quadratic form. Sylvester law. Reduction of a quadratic form to a canonical form.

UNIT-III

Functions of a single and several variables: Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, generalized mean value theorem (all theorems without proof).

Radius, center and circle of curvature. Evolutes and envelopes.

Functional dependence – Jacobian - Maxima and minima of functions of two variables with and without constraints.



UNIT-IV

Applications of Integration: Representation of curves and surfaces in cartesian, parametric and polar co-ordinates. Integral representation of lengths, areas, volumes and surface areas of revolution.

Double integrals: Evaluation of double integrals, changing the order of integration, change of variables, evaluation of plane areas by double integration.

Triple integrals: Evaluation of triple integrals, evaluation using cylindrical and spherical polar co-ordinates, evaluation of the volume of a solid using triple integration.

UNIT-V

Vector Calculus & Tensors: Gradient, divergence, curl and their related properties. Potential function. Line integral - work done - conservative fields - Green's theorem in a plane. Surface integrals - Flux of a vector valued function - Stoke's and Gauss divergence theorems (statement and their verification)- Introduction to tensors.

Text Books

1. Advanced Engineering Mathematics: R.K. Jain and S.R.K. Iyengar. Narosa Publishing House.
2. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.
3. Higher Engineering Mathematics: B.S. Grewal, Khanna Publications.
4. Schaum's outline series on Vector Analysis. Linear Algebra.

Reference Books

1. Schaum's outline series on Linear Algebra.
2. Introduction to Linear Algebra. Gilbert Strang.



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I B.Tech (CSE)**I Semester**

COMPUTER PROGRAMMING AND DATA STRUCTURES

OBJECTIVES: (1) To express algorithms and draw flowcharts in a language independent manner, thus exemplifying the professional ethics (2) To provide the skills necessary for the effective application of computation and computer programming in engineering applications (3) To understand the concepts of C-programming language such as branching, loops, functions, input/output, arithmetic rules, arrays, pointers and files

L: 4, T: 1, Credits: 4**Total Marks: 100 (Int: 25, Ext: 75)****UNIT-I**

Introduction to Computers: System Software, Program Developing Steps, Algorithms, Flowcharts. Introduction to C: Structure of C- Program, Variable Names, Data Types, Constants, Operators, Type Conversions, Expressions, Precedence and Order of Evaluation. Managing I/O: Input-Output Statements, formatted I/O.

UNIT-II

Control Flow: Statements and Blocks, if, switch statements, Loops: while, do-while, for, break and continue, goto and Labels.

Arrays and Strings: Introduction, One- dimensional arrays, Declaring and initializing Arrays, Multidimensional arrays, Strings, String Handling Functions.

UNIT-III

Functions: Introduction, Function Definition, Function Declaration, Return values and their Types, Function Calls, Categories of Functions, nesting of Functions, Recursion, Passing arrays to Functions, Storage Classes.

Structure: Basics of Structures, Structures to Functions, Arrays of Structures, Structures with in Structures, Arrays with in structures, Unions.

UNIT-IV

Pointers: Pointers and Addresses, Pointers and function Arguments, Pointers and arrays, Address Arithmetic, Character pointers and Functions, Pointer Arrays, Pointers to Structures, Pointers to Pointers, Command Line Arguments. Files: Introduction, Types of Files, File Access Functions, I/O on Files, Random Access to Files, Error Handling.



UNIT-V

Sorting: Bubble sort, Merge sort, Insertion Sort, Selection Sort, Quick Sort.

Searching: Linear Search, Binary Search.

Introduction to Data Structures: Basics of Linear and Non-Linear Data structures.

Text Books

1. The C Programming Language, BRIAN W.KERNIGHAN Dennis M.Ritchie, Second Edition, PHI.
2. Computer Programming and Datastructures by E Balaguruswamy, published by Mc GrawHill.

Reference Books

1. Let Us C-Yashwanth Kanetkar, 10th Edition, BPB Publications.
2. C & Data structures - P. Padmanabham, B.S. Publications.
3. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
4. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press.
5. Programming in C - Stephen G. Kochan, III Edition, Pearson Education.
6. Data Structures and Program Design in C, R.Kruse, C.L. Tondo, BP Leung, Shashi M, Second Edition, Pearson Education.
7. Programming in C and Data Structures J.R. Hanly, Ashok N Kamthane and A Ananda Rao, Pearson Education.



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I B.Tech (CSE)**I Semester**

ENGINEERING PHYSICS

OBJECTIVES: (1) To equip the student the nature and concept of various solids and to gain the knowledge of various properties of materials. (2) To make the student learn the classification of materials based on band theory of solids and the electrical and magnetic properties of various materials. (3) To gain knowledge about the various application of lasers and fiber optics and to gain familiarity with the latest developments and trends in nanotechnology

L: 3, T: 1, P: 0; Credits: 3**Total Marks: 100 (Int: 25, Ext: 75)****UNIT-I**

Crystal Structure: Cohesive energy of a solid, Calculation of Cohesive Energy of Ionic crystal, Seven Crystal Systems, Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC.

Defects in Crystals: Point Defects: Vacancies, Substitution, Interstitial, concentration of Frenkel and Scotty Defects; Qualitative treatment of line (Edge and Screw Dislocations) Defects, Burger's Vector, Surface Defects and Volume Defects.

Principles of Quantum Mechanics: Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer's Experiment, G. P. Thomson Experiment, Heisenberg's Uncertainty Principle, Schrödinger's Time Independent Wave Equation -Physical Significance of the Wave Function - Particle in One Dimensional Potential Box.

UNIT-II

Electron theory of Metals: Classical free electron theory, derivation of ohm's law, Mean free path, relaxation time and drift velocity, failures of quantum free electron theory, Fermi-Dirac distribution, Fermi energy, electron scattering and origin of electrical resistance.

Band Theory of Solids: Electron in a periodic Potential, Bloch Theorem, Kronig-Penny Model (Qualitative Treatment), Origin of Energy Band Formation in Solids, Classification of Materials into Conductors, Semi Conductors & Insulators, Effective Mass of an Electron and Concept of a Hole.

Semiconductor Physics: Fermi Level in Intrinsic and Extrinsic Semiconductors,



Intrinsic Semiconductors and Carrier Concentration, Extrinsic Semiconductors and Carrier Concentration, Equation of Continuity, Direct & Indirect Band Gap Semiconductors, Hall Effect.

UNIT-III

Dielectric Properties: Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities -Internal Fields in Solids, Clausius -Mossotti Equation, Piezo-electricity, Pyro-electricity and Ferro-electricity.

Magnetic Properties: Permeability, Field Intensity, Magnetic Field Induction, Magnetization, Magnetic Susceptibility, Origin of Magnetic Moment, Bohr Magnetron, Classification of Dia, Para and Ferro Magnetic Materials on the basis of Magnetic Moment, Domain Theory of Ferro Magnetism on the basis of Hysteresis Curve, Soft and Hard Magnetic Materials, Properties of Anti-Ferro and Ferri Magnetic Materials, Ferrites and their Applications.

UNIT-IV

Lasers: Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers.

Fiber Optics: Principle & construction of Optical Fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers and Refractive Index Profiles, Attenuation in Optical Fibers, Application of Optical Fibers.

UNIT-V

Nanotechnology: Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Bottom-up Fabrication: Sol-gel, Precipitation, Combustion Methods;

Top-down Fabrication: Chemical Vapor Deposition, Physical Vapor Deposition, Carbon nano tubes, Applications.

Text Books

1. Engineering Physics: P.K.Palaniswamy, Scitech Publishers.
2. Engineering Physics: S.O.Pillai, New age International.
3. Applied Physics: T.Bhima Sankaram, G Prasad, BS Publications

Reference Books

1. Solid State Physics: Charles Kittel, Wiley & Sons (Asia) Pte Ltd.
2. Solid State Physics: S.O.Pillai, New age International.
3. Optical Electronics: A.J Ghatak and K.Thyagarajan, Cambridge University Press.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**I Semester**

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

OBJECTIVES: At the end of the course the student is expected to

1. Know the Fundamental Principles of Electrical and Electronics
2. Understand and apply the Basics of Diodes, Transistors, resistors, Inductors, Capacitors etc and apply them to understand various circuits.

L: 3, T: 1, Credits: 3**Total Marks: 100 (Int: 25, Ext: 75)****UNIT-I****Electrical and Single Phase AC Circuits**

Electrical Circuits - R-L-C Parameters, Voltage and Current Independent and Dependent Sources, Source Transformation - V-I relationship for Passive elements, Kirchoff's Laws, Network reduction techniques series, parallel, series parallel, star-to-delta, delta-to-star transformation, Nodal Analysis.

Single Phase AC Circuits - R.M.S. and Average values, Form Factor, steady state analysis of series, Parallel and Series parallel Combinations of R, L and C with Sinusoidal excitation, concept of reactance, Impedance, Susceptance and Admittance - phase and phase difference, Concept of Power Factor, j -notation, complex and Polar forms of representation.

UNIT-II**Resonance and Network Theorems**

Resonance series resonance and parallel resonance circuits, concept of bandwidth and Q factor, Locus Diagrams for RL, RC and RLC Combinations for Various Parameters.

Network Theorems - Thevenin's, Norton's, Maximum Power Transfer, Superposition, Reciprocity, Tellegen's, Millman's and Compensation theorems for DC and AC excitations.

UNIT-III**P-N Junction Diode & Diode Circuits**

P-N Junction Diode: Diode equation, Energy Band diagram, Volt-Ampere characteristic, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit, Load line analysis, Diffusion and Transition Capacitances.



Rectifiers and Filters: The P-N junction as a rectifier - A Half Wave Rectifier, Ripple Factor, Full Wave Rectifier, Bridge Rectifier, Harmonic components in Rectifier Circuits, Filters - Inductor Filters, Capacitor Filters, L- section Filters, π -section Filters.

UNIT-IV

Bipolar Junction Transistor

Bipolar Junction Transistor (BJT) : Construction, Principle of Operation, Symbol, Amplifying Action, Common Emitter, Common Base and Common Collector configurations.

Transistor Biasing And Stabilization : Operating point, DC & AC load lines, Biasing - Fixed Bias, Emitter Feedback Bias, Collector to Emitter feedback bias, Voltage divider bias, Bias stability, Stabilization against variations in V_{BE} , Compensation using Diodes and Transistors. and β , Transistor Configurations : BJT modeling, Hybrid model, Determination of h- parameters from transistor characteristics, Analysis of CE, CB and CC configurations using h-parameters, Comparison of CE, CB and CC configurations.

UNIT-V

Junction Field Effect Transistor & Special Purpose Devices

Junction Field Effect Transistor: Construction, Principle of Operation, Symbol, Pinch-Off Voltage, Volt-Ampere Characteristic, Comparison of BJT and FET, Small Signal Model, Biasing FET.

Special Purpose Devices: Breakdown Mechanisms in Semi Conductor Diodes, Zener diode characteristics, Use of Zener diode as simple regulator Principle of operation and Characteristics of Tunnel Diode (with the help of Energy band diagram) and Varactor Diode, Principle of Operation of SCR.

Text Books

1. Electronic Devices and Circuits R.L. Boylestad and Louis Nashelsky, P E I / PHI, 9th Ed, 2006.
2. Millman's Electronic Devices and Circuits J.Millman and C.C.Halkias, Satyabratajit, TMH, 2/e, 1998.
3. Engineering Circuit Analysis- by William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 6th edition.



Reference Books

1. Introduction to Electronic Devices and Circuits-Rober T. Paynter, Pearson Education.
2. Electronic Devices and Circuits -- K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.
3. Electronic Devices and Circuits Anil K. Maini, Varsha Agarwal Wiley India Pvt. Ltd. 1/e 2009.
4. Linear circuit analysis (time domain phasor and Laplace transform approaches)- 2nd edition by Raymond A. DeCarlo and Pen-Min-Lin, Oxford University Press-2004.
5. Network Theory by N.C.Jagan & C.Lakshminarayana, B.S. Publications.
6. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**I Semester**

ENGLISH

L: 3, T: 1, P: 0; Credits: 3**Total Marks: 100 (Int: 25, Ext: 75)**

OBJECTIVES: (1) To improve English language proficiency of the students with an emphasis on LSRW skills (2) To equip the students study the academic courses with better perspective through the theoretical and practical components of the designed syllabus (3) To develop the study skills and communication skills in formal and informal situations.

UNIT-I

1. Sir C.V. Raman: Subhasree Desikhan, from “Enjoying Everyday English”.
2. Mother Teresa: From, “Inspiring Speeches and Lives”.

UNIT-II

1. The Connoisseur: Nergis Dalal, from “Enjoying Everyday English”.
2. Sam Pitroda: From “Inspiring Speeches and Lives”.

UNIT-III

1. The Cuddlore Experience: Anu George, from “Enjoying Everyday English”.
2. Amartya Kumar Sen: From “Inspiring Speeches and Lives”.

UNIT-IV

1. Bubbling Well Road: Rudyard Kipling, from “Enjoying Everyday English”.
2. I Have a Dream: Martin Luther King Jr., from “Inspiring Speeches and Lives”.

UNIT-V**Exercises on**

1. Reading and writing Skills
2. Reading Comprehension



3. Situational Dialogues
4. Letter Writing
5. Essay writing

Practice exercises on remedial grammar covering

1. Common Errors in English
2. Subject-Verb Agreement
3. Use of Articles
4. Use of Prepositions
5. Tense and Aspect

Vocabulary Development

1. Synonyms and Antonyms
2. One-Word Substitutes
3. Prefixes and Suffixes
4. Idioms and Phrases
5. Pairs of Words Often Confused



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)
I Semester

COMPUTER PROGRAMMING AND DATA STRUCTURES LAB

OBJECTIVES: (1) To introduce the fundamentals of C programming language and develop the skills for solving problems (2) To develop the proficiency in writing programs in a procedural programming language (3) To use the concepts of searching and sorting for solving real-time problems

L: 0, T: 0, P: 6; Credits: 3
Total Marks: 75 (Int: 25, Ext: 50)

TASK-I

- a) Write a C program to find the sum of individual digits of a positive integer.
- b) A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
- c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

TASK-II

- a) Write a C program to calculate the following Sum: $\text{Sum} = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$
- b) Write a C program to find the roots of a quadratic equation using if-else.

TASK-III

- a) Write a C programs that use both recursive and non-recursive functions
 - i) To find the factorial of a given integer.
 - ii) To find the GCD (greatest common divisor) of two given integers.

TASK-IV

- a) The total distance travelled by a vehicle in 't' seconds is given by distance $S = ut + \frac{1}{2}at^2$ where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec²). Write a C program to find the distance travelled by a vehicle at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.
- b) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement)

**TASK-V**

- a) Write a C program to find both the largest and smallest number in a list of integers.
- b) Write a C program that uses functions to perform the following:
 - i) Addition of Two Matrices
 - ii) Multiplication of Two Matrices

TASK-VI

- a) Write a C program that uses functions to perform the following operations:
 - i) To insert a sub-string in to given main string to a given position.
 - ii) To delete n Characters from a given position in a given string.
- b) Write a C program to determine if the given string is a palindrome or not?

TASK-VII

- a) Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn't contain T.
- b) Write a C program to count the lines, words and characters in a given text.

TASK-VIII

- a) Write a C program to generate Pascal's triangle.
- b) Write a C program to construct a pyramid of numbers.

TASK-IX

- a) Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: $1+x+x^2+x^3+\dots+x^n$ For example: if n is 3 and x is 5, then the program computes $1+5+25+125$. Print x, n, the sum performs error checking. For example, the formula does not make sense for negative exponents (–), if n is less than 0. Have your program to print an error message if $n \leq 0$, without computing the sum.
- b) Write a C program that uses functions to perform the following operations:
 - i) Addition of two complex numbers
 - ii) Multiplication of two complex numbers(Note: represent complex number using a structure.)

TASK-X

- a) Write a C Program to display the contents of a file.
- b) Write a C Program merging of two files in a single file.
- C) Write a C Program to append data into a file.

TASK-XI

- a) Write a C program which copies one file to another.
- b) Write a C program to reverse the first n characters in a file.
(Note : The file name and n are specified on the command line.)

**TASK-XII**

- a) Write a C Program to Search for a given element using Linear & Binary Search Techniques.
- b) Write a C Program to Sort a given list of integers using Bubble Sort Technique.

TASK-XIII

- a) Write a C Program to Sort a given list of integers using Merge Sort Technique.
- b) Write a C Program to Sort a given list of integers using Insertion Sort Technique.

TASK-XIV

- a) Write a C Program to Sort a given list of integers using Quick Sort Technique.
- b) Write a C Program to Sort a given list of integers using Selection Sort Technique.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**I Semester**

ENGINEERING PHYSICS LABORATORY

OBJECTIVES: (1) To enable the student to draw the relevance between the theoretical knowledge and to imply it in a practical manner with respect to analyze various electronic circuits and its components. (2) To analyze the behavior and characteristics of various materials for its optimum utilization.

L: 0, T: 0, P: 3; Credits: 3**Total Marks: 75 (Int: 25, Ext: 50)****LIST OF EXPERIMENTS**

1. Measurements using Multimeter.
2. Measurement of voltage and Frequency using CRO.
3. B-H curve.
4. Determination of Dielectric constant.
5. Energy gap of a semi conductor
6. Study of magnetic field along the axis of a circular coil.
7. Study of Hall Voltage
8. Determination of carrier concentration and carrier mobility of a Semiconductor.
9. Numerical Aperture of optical fiber.
10. Bending losses in optical fiber.
11. Air gap losses in optical fiber
12. Characteristics of LASER diode



**GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY**

I B.Tech (CSE)**I Semester**

ENGINEERING WORKSHOP

OBJECTIVES: At the end of the course the student is expected to

1. Know the various trades applicable to industries.
2. Hands on experience for common trades.

L: 0, T: 0, P: 3; Credits: 2**Total Marks: 75 (Int: 25, Ext: 50)****TRADES FOR PRACTICE**

1. Carpentry
2. Fitting
3. Tin – Smithy and Development of jobs carried out and soldering.
4. House – Wiring

DEMONSTRATION

5. Black Smithy-
6. Foundry
7. Welding
8. Plumbing
9. Power tools

Text Books

1. Work Shop Manual: P.Kannaiah, K.I.Narayana, Scitech Publishers.
2. Work Shop Manual: Venkat Reddy.



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)
II Semester

MATHEMATICS - II

OBJECTIVES: Mathematics is the backbone of all Engineering disciplines. Mathematics - II is common to All Branches except BT. At the end of the course, the students will be able to

- (i) Understand and apply the methods of solving the differential equations directly or using Laplace transforms,
- (ii) Solve linear and some nonlinear partial differential equations,
- (iii) Understand the basic of Fourier series and its representation.

L: 4, T: 1, Credits: 4
Total Marks: 100 (Int: 25, Ext: 75)

UNIT-I

First order ordinary differential equations: Formation of ODE. Solution of separable, homogeneous, exact, linear and Bernoulli linear equations

Applications to Newton's law of cooling, Law of natural growth and decay, orthogonal trajectories and geometrical applications.

UNIT-II

Second and higher order ODE with constant coefficients: Solution of second and higher order linear homogeneous differential equations. Non-homogeneous differential equations with RHS term of the type $f(x) = e^{ax}$, $\sin ax$, $\cos ax$, $e^{ax}V(x)$, $x^n V(x)$. Method of variation of parameters-Applications to bending of beams, electrical circuits, simple harmonic motion.

UNIT-III

Laplace transform and its application to ordinary differential equations: Laplace transform of standard functions - inverse Laplace transform - First shifting theorem, Transform of derivatives and integrals - Unit step function - Second shifting theorem - Differentiation and integration of transforms - Dirac's delta function.

Convolution theorem - Periodic function - Application of Laplace transforms to ordinary differential equations



UNIT-IV

Fourier series: Fourier series on the interval $(-\pi, \pi)$: Determination of coefficients, Fourier series of even and odd functions, convergence. Fourier series on an arbitrary interval. Half range Fourier cosine and sine series using even and odd extensions.

UNIT-V

Partial differential equations: Formation of partial differential equations by eliminating arbitrary constants or arbitrary functions. Solutions of first order linear (Lagrange) equation. Solution of nonlinear first order equations (four standard types). Solution using separation of variables. Application to heat equation (one dimension), wave equation (one dimension) and Laplace equation (two dimensions).

Text Books

1. Advanced Engineering Mathematics: R.K. Jain and S.R.K. Iyengar. Narosa Publishing House.
2. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.
3. Higher Engineering Mathematics: B.S. Grewal, Khanna Publications.

Reference Books

1. Schaum's outline series on Vector Analysis; Laplace Transforms; Differential Equations.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**II Semester**

MATHEMATICS III

OBJECTIVES: Mathematics is the backbone of all Engineering disciplines. Mathematics - III is common to All Branches except BT. The course is Numerical solution of problems in various fields. At the end of the course, the students will be able to solve numerically various problems in (i) nonlinear algebraic equations, (ii) systems of linear algebraic equations, (iii) integration, and (iv) initial and boundary value problems in ODE.

L: 4, T: 1, Credits: 4**Total Marks: 100 (Int: 25, Ext: 75)****UNIT-I**

Solution of a non-linear equation & Solution of linear systems: Solution of non- linear equations: Bisection method, Method of false position, Iteration method and Newton-Raphson method.

Solution of linear systems: Gauss elimination, Gauss elimination with partial pivoting, Gauss-Jordan method, Jacobi and Gauss-Seidel iterative methods. Convergence of iterative methods (without proof).

UNIT-II

Interpolation 1 (Interpolation for uniform data): Finite differences Forward, backward and central differences. Relationship between operators. Differences of a polynomial. Newton's forward and backward difference formulas.

UNIT-III

Interpolation 2 (Interpolation for non-uniform data & Splines): Lagrange and Newton's divided difference formulas for unevenly spaced data. Splines: Cubic splines and B-splines.

UNIT-IV

Curve fitting (Method of least squares), Numerical differentiation and numerical integration: Curve fitting: Fitting a first degree (linear) and second degree (parabola), exponential, power curves for a data by the Method of least squares.

Numerical differentiation using the Newton's forward and backward difference formulas. Numerical integration: Trapezoidal and Simpson's 1/3rd rules. Gauss-Legendre one point, two point and three point rules for integration.



UNIT-V

Numerical solution of Initial Value Problems and Boundary Value problems

in ODE: Numerical solution of Initial Value Problems: Picard's method of successive approximation. Solution by Taylor series method, Euler method, Runge-Kutta methods of second and fourth orders. Predictor-corrector methods. Combinations of first and second order P-C methods.

Numerical solution of Boundary Value Problems in ODE: Finite difference methods for solving second order linear ODE.

Text Books

1. Advanced Engineering Mathematics: R.K. Jain and S.R.K. Iyengar. Narosa Publishing House.
2. Advanced Engineering Mathematics: Erwin Kreyszig, Wiley.
3. Higher Engineering Mathematics: B.S. Grewal, Khanna Publications.
4. Mathematical Methods: S.R.K. Iyengar and R.K. Jain, Narosa Publishing House.

Reference Books

1. Numerical Methods for Scientific & Engineering Computation: M.K. Jain, S.R.K. Iyengar, and R.K. Jain. New Age International Publications.
2. Introductory Methods of Numerical Analysis. S.S. Sastry, Prentice Hall.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**II Semester**

ENGINEERING CHEMISTRY

OBJECTIVES: At end of the course, the student should be able to understand the

1. Role of polymers and nano materials in engineering applications.
2. Role of chemistry (conducting polymers) in the energy production.
3. Material behavior for application in environmental applications.
4. Basic concepts of application of materials in all fields of engineering.

L : 3, T : 1, P : 0, Credits : 3**Total Marks : 100 (Int : 25, Ext : 75)****UNIT-I**

Electrochemistry: Concept of Conductance- Specific, Equivalent and molar conductance and ionic conductance, electrolytic cells - Galvanic Cells, Potentiometric titrations - strong acid vs strong base, electrochemical series Concentration Cells

Corrosion - causes and effects of corrosion , theories of corrosion – Chemical, Electrochemical corrosion, factors affecting Corrosion control methods – Cathodic protection, sacrificial anode, impressed current cathode. Surface coatings – methods of application on metals- hot dipping, galvanizing, tinning, cladding, electroplating, Paints – constituents and their functions.

UNIT-II

Water Technology: Introduction, Hardness: Causes, expression of hardness – units types of hardness, estimation of temporary & permanent hardness of water complexometric method , Boiler troubles – Scale & sludge formation, caustic embrittlement, priming & foaming, Softening of water - Internal and external treatment, Ion exchange process and Numerical problems, Desalination of brackish water - Reverse osmosis, electro dialysis.

UNIT-III

Polymer Technology: Types of Polymerization, Plastics: Thermoplastic resins & Thermo set resins. Compounding & fabrication of plastics, preparation, properties, engineering applications of polyethylene, PVC, poly styrene, Teflon, Bakelite, Nylon. Conducting Polymers: Poly acetylene, polyaniline,



applications. Liquid Crystal polymers: Characteristics and uses, Rubber – Natural rubber, vulcanization. Elastomers – Butyl rubber, Thiokol rubbers, Fiber reinforced plastics (FRP), Biodegradable polymers.

UNIT-IV

Energy sources: Concept and classification of fuels - solid, liquid, gaseous , Solid fuels – coal – analysis – proximate and ultimate analysis and their significance, Liquid fuels – petroleum, refining of petroleum – definition of cracking and its significance, knocking - octane number, cetane number, synthetic petrol – Bergius and Fischer Tropsech's process method, Gaseous fuels – natural gas, LPG, CNG, Calorific value of fuel – HCV, LCV, Introduction to biodiesel, problems.

UNIT-V

Engineering Materials

Cement: Composition and manufacture of port land Cement, setting & hardening of cement .

Lubricants: Definition and classification , theories of lubricants, properties - Cloud point, pour point, flash and fire point, Viscosity.

Refractories: Classification, Characteristics of a good refractory and failure mechanism of refractory materials.

Batteries: Definition and classification, Primary - dry cell, Secondary cells - lead-Acid cell, Ni-Cd cell, and Lithium cells , Fuel cells – Hydrogen – Oxygen fuel cells and uses. Nanomaterials – Introduction, general methods of preparation, applications.

Text Books

1. Text book of Engineering Chemistry: Y. Bhatikumar and C. Jyosna , V G S Book links, Vizayawada, A.P, Edition June 2009.
2. Text Book of Engineering Chemistry: C.P. Murthy, C.V. Agarwal, and A. Naidu, B.S. Publications, Hyd.
3. Text book of Engineering Chemistry by P.C Jain and Monika Jain , Dhanpat Rai Publishing company (p) Ltd , K.K. Group , New Delhi(2006)

Reference Books

1. Chemistry of Engineering Materials: R.P Mani and K.N.Mishra, CENGAGE learning.
2. Text of Engineering Chemistry: S.S. Dara & Mukkati S. Chand & Co, New Delhi(2006)



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**II Semester**

ENVIRONMENTAL SCIENCE

L: 3, T: 1, Credits: 3**Total Marks: 100 (Int: 25, Ext: 75)****UNIT-I**

Introduction to Environment, Ecology and Ecosystems: Definition, Importance and Scope of Environmental Studies, Public Awareness and Participation. Ecology, Concept of Ecosystem, Classification of Ecosystem, Structure, Components and Function of Ecosystem. Typical Ecosystem, Food Chain, Food Web. Biodiversity- Types and values.

UNIT-II

Natural Resources: Definition, Occurrence, Classification of resources, Important natural resources for human society, Utilization-positive and negative effects of water resources, Mineral resources, Forest resources, Energy resources, Land resources. Role of individuals in conservation of important natural resources.

UNIT-III

Environmental Pollution: Definition, Classification of Pollution, Type of Pollution and Pollutants. Causes, effects and control of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution and Nuclear Pollution.

UNIT-IV

Environmental Problems and Management Policies: Natural Disasters-Types, causes and effects; Global warming, Climate change-El Nino-La Nina, Ozone layer- location, role and degradation; deforestation and desertification.

Management: Technological solutions, Preventive methods, control techniques; Green Belt development, Rainwater harvesting, Renewable and alternate resources.

UNIT-V

National Policy on Environment protection and Sustainability: Air (Pollution and prevention) act 1981; Water (Pollution and prevention) Act 1974; Pollution Act 1977; Forest Conservation Act; Wildlife Protection Act; Municipal solid waste management and handling Act; Biomedical waste management and handling Act; Hazardous waste management and handling rules. Role of IT in environment, environmental ethics, environmental economics.



Sustainable development: Cause and Threats to sustainability; strategies for achieving sustainable development; Concept of Green building and Clean Development Mechanism (CDM).

Text Books

1. Text Book of Environmental Studies, Erach BArucha. University Press
2. Text book of Environmental Science and Technology by M.Anji Reddy 2007

Reference Books

1. Biotechnology & Environmental Chemistry. Surinder Jeswal & Anupama Deswal, Dhanpat Rai & Co Pvt. Ltd.
2. A Text Book of Environmental Science. Aravind Kumar. APH Publishing Corporation.
3. Glimpses of Environment. Dr. KVSG. Murali Krishna. Environmental Protection Society.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**II Semester**

ENGINEERING GRAPHICS

OBJECTIVES: At the end of the course the student is expected to

1. Learn the fundamental concepts of Engineering Graphics.
2. Drafting Practice for Geometrical Drawing and Projections.
3. Introduction to Auto CAD.

L: 3, T: 0, P: 4: Credits: 3**Total Marks: 100 (Int: 25, Ext: 75)****UNIT-I**

Introduction to Engineering Drawing: Principles of Engineering Graphics and their significance - Drawing Instruments and their Use - Conventions in Drawing - Lettering - BIS Conventions. Curves used in Engineering Practice & their

Constructions: (a) Conic Sections, (b) Cycloid, Epicycloid and Hypocycloid, (c) Involute. (d) Scales: Different types of scales. Plain Scale, Diagonal Scale & Vernier Scale.

UNIT-II

Drawing of Projections or Views of Orthographic Projection in First Angle Projection only:

Principles of Orthographic Projections - Conventions - First and Third Angle Projections. Projections of Points and Lines inclined to both planes, True lengths, traces. Projections of regular Planes: inclined to both planes.

UNIT-III

Projections of Solids: Projections of Regular Solids inclined to both planes.

Development of Surfaces: Development of Surfaces of Right Regular Solids Prisms, Cylinder, Pyramid Cone and their parts.

UNIT-IV

Isometric Projections: Principles of Isometric Projection Isometric Scale Isometric Views Conventions Isometric Views of Lines, Plane Figures, Simple and Compound Solids Isometric Projection of objects having non-isometric lines. Isometric Projection of Spherical Parts.



Transformation of Projections: Conversion of Isometric Views to Orthographic Views Conventions.

UNIT-V

Introduction to Computer Aided Drafting

Generation of points, lines, curves, polygons, simple solids and their dimensioning.

Text Books

1. Engineering Drawing, N.D. Bhat, Charotar.
2. Engineering graphics with Auto CAD- R.B. Choudary, Anuradha Publishers.

Reference Books

1. Engineering Drawing and Graphics, Venugopal, New age.
2. Engineering Drawing- Johle, Tata Macgraw Hill.
3. Computer Aided Engineering Drawing- Trymbaka Murthy- I.K. International.
4. Engineering Drawing, Narayana and Kannaiah, Sciotech publishers.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**II Semester**

IT WORKSHOP

OBJECTIVES: At end of the programme, the student should be able to understand

1. To introduce the students to a PC and its basic peripherals, the process of assembling and disassembling the PC and to install software's.
2. To increase the ability of the students in effective usage of Internet using web browsers and how to protect the system from virus.
3. To enable the students in crafting professional word documents, excel spread sheets and power point presentation using Microsoft office tools.
4. To provide basic knowledge about the networking devices Routers and Switches .In addition it include, how to connect those devices using different cables.

L: 0, T: 0, P: 3**Total Marks: 75 (Int: 25, Ext: 50)**

PC HARDWARE: Introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows , Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced. Productivity tools module would enable the students in crafting professional word documents, spread sheets and slide presentations.



PC Hardware

Task-1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task-2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task-3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task-4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task-5: Hardware Troubleshooting : Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

Task-6: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web

Task-7: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task-8: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macro media Flash and JRE for applets should be configured.



Task-9: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task-10: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti virus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Productivity Tools

Task-11: Introducing features of professional word documents like opening, closing, editing, saving, printing, and text formatting.

Task-12: Students would be exposed to create word documents with images, tables, formulas, and with additional word processing features.

Task-13: Introducing features of professional spread sheets like opening, closing, editing, saving, printing, and text formatting.

Task-14: Students would be exposed to compile spread sheets using formulas, different number formats, text formats and conditional formatting.

Task-15: Introducing features of professional slide presentations like opening, closing, editing, saving, printing, and text formatting.

Task-16: Students would be exposed to create slide presentations with tables, different views of slide presentations, master slides, custom animations.

Reference Books

1. Introduction to Information Technology, ITL Education Solutions Limited, Pearson Education.
2. Introduction to Computers, Peter Norton, 6/e Mc Graw Hil.I
3. Upgrading and Repairing, PC's 18th e, Scott Muller QUE, Pearson Education.
4. Comdex Information Technology Course tool kit Vikas Gupta, WILEY Dreamtech.
5. IT Essentials PC Hardware and Software Companion Guide, Third Edition by David Anfinson and Ken Quamme- CISCO Press, Pearson Education.
6. PC Hardware and A+Handbook Kate J. Chase PHI (Microsoft).



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**II Semester**

ENGINEERING CHEMISTRY LABORATORY

OBJECTIVES: At end of the course, the student should be able to understand

1. The characteristics and preparation of rubber.
2. The characteristics and nature of lubricating oils.
3. The hard water analysis process.
4. Basic concepts of analysis and application of materials in all fields of engineering.

L : 0, T : 0, P : 3 Credits : 3**Total Marks : 75 (Int : 25 , Ext : 50)**

LIST OF EXPERIMENTS

1. **Conductometry:** Conductometric titrations of strong acid verses strong base.
2. **Potentiometry:** Potentiometric titration of strong acid verses strong base.
3. **Lubricants:** Determination of viscosity of a sample oil by Redwood viscometer-I.
4. **Lubricants:** Determination of surface tension of lubricants by stalagmometer.
5. Organic preparations: Preparation of Aspirin and Thiokol rubber.
6. **Complexometry:** Estimation of hardness of water by using standard EDTA solution.
7. **Complexometry:** Estimation of copper by using standard EDTA solution.
8. **Permanganometry:** Estimation of ferrous iron by using standard potassium permanganate solution.
9. **Permanganometry:** Estimation of ferric iron by using standard potassium dichromate solution.
10. **Colorimetry:** Estimation of ferrous iron in cement by using colorimeter.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

I B.Tech (CSE)**II Semester**

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

OBJECTIVES: To expose the students to a variety of self-instructional, learner-friendly modes of language learning.

- (i) To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such as GRE, TOEFL, GMAT etc.
- (ii) To enable them better pronunciation through stress on word accent, intonation, and rhythm.
- (iii) To train students to use language effectively to face interviews, group discussions, public speaking.
- (iv) To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.

L: 0, T: 0, P: 3, C: 2**Total Marks : 75 (Int : 25 , Ext : 50)**

SYLLABUS: The following course content is prescribed for the English Language Laboratory sessions:

- (i) Introduction to the sounds of English –Vowels, Diphthongs & Consonants.
- (ii) Situational Dialogues/Role-play.
- (iii) 'Just A Minute' Sessions (JAM).
- (iv) Describing Objects/Situations/People.
- (v) Information Transfer. (vi) Debate.
- (vii) Telephone Skills.
- (viii) Giving Directions.



Suggested Software

- (i) Cambridge Advanced Learners' English Dictionary with CD.
- (ii) The Rosetta Stone English Library.
- (iii) Clarity Pronunciation Power-Part 1.
- (iv) Mastering English in Vocabulary, Grammar, Spelling, and Composition.
- (v) Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- (vi) Language in use , Foundation Books Pvt Ltd with CD.
- (vii) Oxford Advanced Learner's Compass, 7th Edition.
- (viii) Learning to speak English-4 CDs.
- (ix) Vocabulary in Use, Michael McCarthy, Felicity O' Den, Cambridge.
- (x) Murphy's English Grammar, Cambridge with CD.
- (xi) English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

Books (to be located within the lab in addition to the CDS of the text book which are loaded on the systems):

1. English Language Communication Skills – A Reader cum Lab Manual Course content and Practice (with CD) Dr. A. Rama Krishna Rao, Dr.G.Natanam, Prof .S.A Sankaranarayanan. Publishers:Anuradha Publications, Chennai
2. A Handbook of English for professionals-Fourth Edition Dr.P.Elijah, BS Publications.
3. Better English Pronunciation, JD O' Connor, Cambridge University Press.
4. A Foundation English Course for undergraduates (Practice exercises on skills) Paul Gunashekar Shyamala Kumar Das Sachil Mahadevan, Oxford University Press.
5. Improve Your Writing, V.N.Arora & Lakshmi Chandra, Oxford University Press.



6. Speaking English Effectively, Krihna Mohan & N.P. Singh, Macmillian Publishers.
7. English Conversation for Indian Students, Y.V. Yardi, Orient Longman.
8. The Written Word, B Vandana R. Singh, Oxford University Press.
9. Strengthen Your Writing, V.R. Narayanaswami, Orient Longman Publishers.
10. A Handbook of Standard English and Indian Usage, J. Sethi Prentice Hall.
11. Essential Telephoning in English, Tony Garside and Barbara Garside, Cambridge press.
12. English Conversation Practice Spoken English, Grant Taylor, Tata McGraw Hill
13. English Conversation Practice Spoken English, Jayashree Balan, Vijay Nicole Imprints Pvt.Ltd.
14. How to Prepare for Group Discussion and Interview, V.Sasi Kumar P V Dhamija, Tata McGraw Hill
15. Speaking English Effectively, Hari Mohan Prasad Rajnish Mohan Krishna Mac Millan Publishers





II-Year





GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**I Semester**

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

UNIT-I

Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, Tautology, Equivalence implication, Normal forms.

Predicates: Predicative logic, Free and Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT-II

Set Theory : Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function, Composition of functions, recursive Functions, Lattice and its Properties, Pigeon hole principles and its application.

Algebraic structures : Algebraic systems Examples and general properties, Semi groups and monoids, groups, sub groups, Homomorphism, Isomorphism.

UNIT-III

Elementary Combinatorics: Basis of counting, Combinations and Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial and Multinomial theorems, the principles of Inclusion Exclusion.

UNIT-IV

Recurrence Relation: Generating Functions, Function of Sequences, Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating functions, Characteristics roots solution of non homogeneous Recurrence Relation.

UNIT-V

Graph Theory: Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

Text Books

1. Discrete and Combinational Mathematics-An Applied Introduction-5th Edition Ralph. P.Grimaldi, Pearson Education



2. Discrete Mathematical Structures with applications to computer science
Trembly J.P. and Manohar .P, TMH
3. Mathematical Foundations for Computer Science Engineers, Jayant
Ganguly, Pearson Education
4. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth
Edition. TMH.

Reference Books

1. Discrete Mathematics with Applications, Thomas Koshy, Elsevier
2. Discrete Mathematical Structures, Bernard Kolman, Roberty C. Busby,
Sharn Cutter Ross, Pearson Education/PHI.
3. Discrete Mathematical structures Theory and application-Malik and Sen
4. Discrete Mathematics for Computer science, Garry Haggard and others,
Thomson.
5. Discrete Mathematics for Computer Scientists and Mathematicians, J.L.
Mott, A. Kandel, T.P. Baker Prentice Hall.
6. Logic and Discrete Mathematics, Grass Man and Trembley, Person
Education.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**I Semester**

DATA STRUCTURES THROUGH C++

UNIT-I

Introduction to OOP, 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 de allocation (new and delete), exception handling.

UNIT-II

Function Overloading, 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

Review of basic data structures - the list ADT, stack ADT, queue ADT, implementation using template classes in C++, Dictionary- Hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

UNIT-IV

Trees: Binary search trees, definition, ADT, implementation, operations-searching, insertion and deletion, Tree Traversals, Balanced search trees- AVL trees, definition, height of an AVL tree, representation, operations-insertion, deletion and searching, B-Trees-B-Tree of order m, height of a B-Tree, insertion, deletion and searching.

UNIT-V

Graphs: Representation of Graphs, Topological Sort, Shortest Path Algorithms-Dijkstra's Algorithms, Depth First Search and Breadth First Search, Minimum spanning trees-Prim's and Kruskal's Algorithms.



Text Books

1. Data Structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education, second edition.
2. Object Oriented Programming with C++, E Balagurusamy, Mcgraw Hill Higher Education, Second edition.

Reference Books

1. Object Oriented Programming with C++, Subhash K U, Pearson
2. Data structures and Algorithms in C++, Michael T. Goodrich, R. Tamassia and D. Mount, Seventh Edition Wiley student edition, John Wiley and Sons.
3. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson
4. C++, The Complete Reference, 4th Edition, Herbert Schildt, TMH.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**I Semester**

DATA BASE MANAGEMENT SYSTEMS

UNIT -I

Data base System Applications, data base System VS file System - View of Data - Data Abstraction - Instances and Schemas - 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 design and ER diagrams -Attributes and Entity sets - Relationships and Relationship sets -Concept Design with the ER Model .

UNIT-II

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 /altering Tables and Views.

Form of Basic SQL Query - Examples of Basic SQL Queries - Introduction to Nested Queries - Correlated Nested Queries Set - Comparison Operators - Aggregative Operators - NULL values - Comparison using Null values - Logical connectivity's - AND, OR and NOT - Impact on SQL Constructs - Outer Joins - Disallowing NULL values - Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT-III

Schema refinement - Problems Caused by redundancy - Decompositions - Problem related to decomposition - reasoning about FDS - FIRST, SECOND, THIRD Normal forms - BCNF - Lossless join Decomposition - Dependency preserving Decomposition - Schema refinement in Data base Design - Multi valued Dependencies - forth Normal Form.

UNIT-IV

Transaction Concept: Transaction State - Implementation of Atomicity and Durability- Concurrent - Executions - Serializability- Recoverability - Implementation of Isolation-Testing for serializability - Lock based Protocols - timestamp based protocols - validation based protocols - Multiple Granularity.

Recovery and Atomicity - Log based recovery - Recovery with concurrent transactions- Buffer Management.



UNIT-V

Data on External Storage - File Organization and Indexing - Cluster Indexes, Primary and Secondary Indexes - Index data Structures -Hash Based Indexing - Tree base Indexing - Comparison of File Organizations -Intuitions for tree Indexes- Indexed Sequential Access Methods (ISAM) - B+ Trees: A Dynamic Index Structure.

Text Books

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. Data base System Concepts, Silberschatz, Korth, McGraw hill, V edition.

Reference Books

1. Introduction to Database Systems, C.J.Date Pearson Education.
2. Data base Systems design, Implementation, and Management, Rob and Coroneil 5th Edition. Thomson.
3. Database Management Systems P. Radha Krishna HI-TECH Publications 2005.
4. Data base Management System, Elmasri Navrate Pearson Education.
5. Data base Management System Mathew Leon, Leo.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**I Semester**

DIGITAL LOGIC DESIGN

UNIT-I

Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.

Boolean Algebra And Logic Gates: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates, Integrated Circuits.

UNIT-II

Gate-Level Minimization: The Map method, Four-variable map, Five-Variable map, Product of Sum's simplifications, Don't care conditions, NAND and NOR implementation, other two level implementations, Exclusive-OR Function.

UNIT-III

Combinational Logic: Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adder - Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT-IV

Synchronous Sequential Logic: Sequential Circuits, latches, Flip-Flops, Analysis of clocked sequential circuits, HDL for sequential circuits, State Reduction and Assignment, Design Procedure.

Registers and Counters: Registers, shift registers, Ripple Counters, Synchronous Counters, other counters.

UNIT-V

Memory and Programmable Logic: Introduction, Random Access Memory, Memory Decoding, Error Detection and Correction, Read Only Memory, Programmable logic Array, Programmable Array Logic, Sequential Programmable Devices.

Hardware Description Language: Hardware Description Language, Definition, Structural Definition of HDL, HDL Models for Combinational circuits, HDL for Models for Sequential circuits.



Text Books

1. Digital Design - Fourth Edition, M. Morris Mano, Pearson Education.
2. Fundamentals of Logic Design - Roth, 5th Edition, Thomson.

References Books

1. Switching and Finite Automata Theory by Zvi Kohavi, Tata Mc Graw Hill.
2. Switching and Logic Design - CVS Rao, Pearson education.
3. Digital Principles and Design - Donald D. Givone, Tata Mc Graw Hill.
4. Fundamentals of Digital Logic and Micro Computer Design, 5th Edition, M. Rafiquzzaman (John Willey).



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**I Semester**

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

UNIT-I

OOP Concepts, History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, 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: Base class object, subclass, Member access rules, super uses, using final with inheritance, Polymorphism- method overriding, abstract classes.

Packages and Interfaces: Defining, Creating and Accessing a Package, importing packages Defining an interface, implementing interface, differences between classes and interfaces and extending interfaces. Exploring packages - Java.io, Java.util.

UNIT-III

Exception handling - Concepts of exception handling, benefits of exception handling exception hierarchy, Checked and Unchecked Exceptions, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes.

Multithreading - Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

UNIT-IV

Applets - Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

Event Handling : Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists.



UNIT-V

Layout manager: layout manager types - border, grid, flow, card and grid bag

Swing: Introduction, limitations of AWT, Components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons - The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

Text Books

1. Java; the complete reference, 7th editon, Herbert Schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson education.

Reference Books

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John Wiley and sons.
2. An Introduction to OOP, second edition, T. Budd, pearson education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.
4. An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**I Semester**

DATA STRUCTURES THROUGH C++ LAB

Task-1: Write C++ programs to implement the following

- a) Constructors and destructors b) Friend functions

Task-2 : Write C++ programs to implement the following

- a) Function and Operator
- b) Function and Class Overloading Templates
- c) Inheritance

Task-3: Write C++ programs to implement the following

- a) Polymorphism b) Streams I/O

Task-4: Write C++ programs to implement the following using an array.

- a) Stack ADT b) Queue ADT

Task-5: Write C++ programs to implement the following using a singly linked list.

- a) Stack ADT b) Queue ADT

Task-6: Write a C++ program to implement all the functions of a dictionary (ADT) using Hashing

Task -7: 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.

Task-8: Write C++ programs using Recursive and Non-recursive functions to traverse the given binary tree in

- a) Preorder b) Inorder and c) Postorder.



Task-9: Write C++ programs for the implementation of BFS and DFS for a given graph.

Task-10: Write a C++ program to perform the following operations

A) Insertion into an AVL-tree b) Deletion from an AVL-tree

Task-11: Write a C++ program to implement Kruskal's algorithm to generate a minimum cost spanning tree.

Task-12: Write a C++ program to implement Prim's algorithm to generate a minimum cost spanning tree.

Text Books

1. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson.
2. Data Structures using C++, D.S. Malik, Thomson



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**I Semester**

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB

OBJECTIVES: To make the student learn a 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 atleast 64 MB RAM and 100 MB free disk space JDK Kit. Recommended.

Task-1: Write java programs that implement the following

- a. Constructor
- b. Parameterized constructor
- c. Method overloading
- d. Constructor overloading.

Task-2:a. Write a java program that uses access specifiers.

- b. Write a java program that implements the concepts of static and final keywords.

Task-3: Write java programs that implement the following concept

- a. Method overriding.
- b. Super keyword.
- c. Abstract classes.
- d. Interfaces.

Task-4: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 that reads a line of integers, and then displays each integer, and the sum of all the integers (Use StringTokenizer class of java.util)

Task-5: 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

Task-6

- 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.

Task-7

- 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.

Task-8 : 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.

Task-9

- a. Write a Java program for handling mouse events.
- b. Write a Java program for handling key events.

Task-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 Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

Task-11

- 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.

Task-12

- 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 by commas. Write a java program to display the table using Jtable component.

Text Books

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



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**I Semester**

DATA BASE MANAGEMENT SYSTEMS LAB

OBJECTIVES

To teach the student database design and query and PL/SQL.

Recommended Systems/Software Requirements

Intel based desktop PC

Mysql /Oracle latest version Recommended

Task-1: Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables)
Examples using SELECT command.

Task-2: Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOT EXISTS, UNION, INTERSET, Constraints.

Example:- Select the roll number and name of the student who secured fourth rank in the class.

Task-3: Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Task-4: Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

Task-5

- i) Creation of simple PL/SQL program which includes declaration section, executable section and exception Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
- ii) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.



- Task-6:** Develop a program that includes the features NESTED IF and CASE expression. The program can be extended using the NULLIF and COALESCE functions.
- Task-7:** Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.
- Task-8:** Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.
- Task-9:** Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.
- Task-10:** Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.
- Task-11:** Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.
- Task-12:** Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

Text Books

1. ORACLEPL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition
2. ORACLE DATABASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc-Graw Hill.
3. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**II Semester**

COMPUTER ORGANIZATION

UNIT-I

Basic Structure of Computers: Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Multiprocessors and Multi computers., Data Representation, Fixed Point Representation, Floating Point Representation, Error Detection codes.

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.

UNIT-II

Basic Computer Organization and Design: Instruction codes, Computer Registers, Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Input Output and Interrupt, Complete Computer Description.

Micro Programmed Control: Control memory, Address sequencing, micro program example, design of control unit, Micro program Sequencer, Hard wired control Vs Micro programmed control,

UNIT-III

Central Processing Unit Organization: General Register Organization, Stack organization. Instruction formats, Addressing modes. Data Transfer and manipulation, Program control. Reduced Instruction set computer.

Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Floating point Arithmetic operations, BCD Adder.

UNIT-IV

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt, Direct memory Access, Input -Output Processor (IOP).

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Dependencies, Vector Processing.



UNIT-V

Memory Organisation: Memory Hierarchy, Main memory- RAM and ROM chips, Memory Address map, Auxiliary memory - Magnetic Disks, Magnetic Tapes, Associative Memory - Hardware Organization, Match Logic, Cache Memory - Associative mapping, Direct mapping, Set associative mapping, Writing into cache and cache initialization, Cache Coherence, Virtual memory - Address Space and Memory Space, Address mapping using pages, Associative Memory page table, Page Replacement.

Multi Processors: Characteristics or Multiprocessors, Interconnection Structures, Cache Coherence, Shared Memory Multiprocessors.

Text Books

1. Computer Systems Architecture - M.Moris Mano, IIIrd Edition, Pearson/PHI
2. Computer Organization Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.

Reference Books

1. Computer Organization and Architecture - William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization - Andrew S. Tanenbaum, 4th Edition PHI/ Pearson
3. Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition.
4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**II Semester**

OPERATING SYSTEMS

UNIT-I

Computer System and Operating System Overview: Overview of computer operating systems , operating systems functions, protection and security, distributed systems special purpose systems ,operating systems structures and systems calls, operating systems generation

UNIT-II

Process Management: Process concepts , threads, scheduling-criteria, algorithms, their evaluation, Thread scheduling, case studies Linux, Windows .

Concurrency: Process synchronization, the critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions, Case studies Linux, Windows

UNIT-III

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table , segmentation, virtual memory, demand paging, page-Replacement-algorithms, case studies Linux, Windows

Principles of deadlock: System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock.

I/O systems: Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, performance.

UNIT-IV

File system Interface: the concept of a file, Access Methods, Directory structure, file sharing, protection.

File System implementation: File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance.

Mass-storage structure: Overview of Mass-storage structure, Disk structure, disk attachment , disk scheduling, swap-space management, RAID structure, stable- storage implementation, Tertiary storage structure.



UNIT-V

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language - Based Protection.

Security: The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer - security classifications.

Text Books

1. Operating System Concepts-Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating Systems' Internal and Design Principles Stallings, Fifth Edition 2005, Pearson education/PHI

Reference Books

1. Operating systems- A Concept based Approach-D.M.Dhamdhere, 2nd Edition, TMH
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**II Semester**

PROBABILITY AND STATISTICS

UNIT-I

Probability: Basic concepts in Probability - Sample space, event, mutually exclusive and exhaustive events The axioms of probability Conditional probability and independence of events Addition and Multiplication theorems for two events - Bayes theorem, Boole's inequality.

Random variables: Definition of a random variable, discrete and continuous random variables Distribution function, probability mass function, probability density function with illustrations - Joint, marginal and conditional distributions with illustrations - Mathematical expectation of a r.v and of a function of a r.v. and its properties Addition and Multiplication theorems of expectation for two variables- Moment Generating Function and Characteristic function, statements of their properties.

UNIT-II

Distributions: Binomial, Poisson distributions, Mean, variance, moment generating function, fitting of these distributions - Uniform, Normal, Exponential distributions, properties of these distributions, fitting of Normal distribution.

Sampling distribution: Definition of Population and sample, Overview of types of sampling (Random, Purposive, SRS, Stratified and Systematic random samplings) - Sampling distribution, standard error, sampling distribution of mean (known and unknown) and proportions.

UNIT-III

Estimation and Testing of Hypothesis: Point estimation - Interval estimation - Bayesian estimation- Confidence interval for mean, difference of means and for proportions. Concepts of Null hypothesis, Alternative hypothesis, Critical region, Type I and Type II errors, One tail and two-tail tests, Level of significance.

Large Samples Tests: Tests of hypothesis for means (single and difference between means), Tests of hypothesis for proportions (single and difference between proportions), Chi-square test for testing goodness of fit, independence of attributes and single population variance.

UNIT-IV

Correlation and Regression: Product moment correlation coefficient, Spearman's rank correlation coefficient and their properties Simple linear



regression, Lines of Regression, Regression coefficient and their properties, Multiple regression for three variables only.

Small samples: Student's t-test for testing the significance of single mean, difference of means(independent samples and paired samples), significance of observed sample correlation coefficient - F-test for equality of variances and ANOVA(1-way and 2-way), Concept and problem solving.

UNIT-V

Stochastic Process: Introduction to Stochastic Process-Markov process, Classification of states-Examples of Markov chains, stochastic matrix, limiting probabilities.

Queuing theory: Queue description, characteristics of a queuing model, Poisson process, concept of Birth and death process, steady state solutions of (M/M/1: / FIFO) and (M/M/1: N/FIFO).

Text Books

1. Probability and statistics for engineers (Erwin Miller and John E. Freund), R.A Johnson and C.B. Gupta.
2. Fundamentals of Stochastic process-B.R. Bhat
3. Probability, Statistics and Queuing Theory, 2nd Edition, Trivedi, John Wiley and Sons
4. Operations Research by Manmohan, Kantiswaroop and Gupta.

Reference Books

1. Fundamentals of Mathematical Statistics, S.C. Gupta, V.K. Kapoor
2. Probability, Statistics and Queuing Theory with computer applications- Arnold O. Allen
3. Introduction to Probability and Statistics, 12th edition, W. Mendenhall, R.J. Beaver and B.M. Beaver, Thomson. (Indian edition)
4. Probability and Statistics in Engineering, 4th Edition, William W. Hines, Douglas C. Montgomery, David M. Goldsman, Connie M. Borror, Wiley Student Edition.
5. Introduction to Probability and Statistics, J.S. Milton, Jesse C. Arnold, 4th edition, TMH.
6. Mathematical Statistics by Biswas and Srivatsava .



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**II Semester**

FORMAL LANGUAGES AND AUTOMATA THEORY

UNIT-I

Fundamentals : Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings and languages, deterministic finite automaton and non-deterministic finite automaton, transition diagrams and language recognizers.

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-II

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-III

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-IV

Context Free Grammars: Ambiguity in context free grammars, Minimisation of Context Free Grammars, Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages, Enumeration of properties of CFL.

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, interconversion. Introduction to DCFL and DPDA.

UNIT-V

Turing Machine : Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines.



Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of problems, Universal Turing Machine, undecidability of posts correspondence problem, Turing reducibility, Definition of P and NP problems, NP complete and NP hard problems.

Text Books

1. “Introduction to Automata Theory Languages and Computation”, Hopcroft H.E. and Ullman J. D, Pearson Education.
2. “Introduction to Theory of Computation” Sipser 2nd edition Thomson.

Reference Books

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



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**II Semester**

DESIGN AND ANALYSIS OF ALGORITHMS

UNIT-I

Introduction, algorithm, pseudo code for expressing algorithms, performance analysis, space complexity, time complexity, asymptotic notation, big oh notation, omega notation, theta notation, and little oh notation, probabilistic analysis, amortized analysis. Disjoint sets, disjoint set operations, union and find algorithms, spanning trees, connected components, biconnected components .

UNIT-II

Divide and conquer: General method, applications, binary search, quick sort, merge sort, strassen's matrix multiplication.

Greedy method: General method, applications, job sequencing with deadlines, 0/1 knapsack problem, minimum cost spanning trees, single source shortest path problem.

UNIT-III

Dynamic programming: General method, applications, matrix chain multiplication, optimal binary search trees, 0/1 knapsack problem, all pairs shortest path problem, travelling sales person problem, reliability design.

UNIT-IV

Backtracking: General method, applications, n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Branch and Bound-I: General method, applications, travelling sales person problem.

UNIT-V

Branch and Bound-II: 0/1 knapsack problem:LC branch and bound solution, FIFO branch and bound solution.

NP-hard and NP-complete problems: basic concepts, non deterministic algorithms, deterministic algorithms.



Text Books

1. Ellis Horowitz, Satraj Sahni and S Rajasekharam, Fundamentals of Computer Algorithms, Galgotia publishers.
2. Parag Himanshu Dave, Himanshu Bhalchandra Dave, Design and Analysis algorithms Pearson Publication.

Reference Books

1. T H Cormen, C E Leiserson, and R L Rivest, Introduction to Algorithms, 2nd Edn, Pearson Education .
2. R C T Lee, Hang and T T Sai, Introduction to Design and Analysis of Algorithms, A strategic approach, TMH.



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II B.Tech (CSE)**II Semester**

OPERATING SYSTEMS AND UNIX INTERNALS LAB

OBJECTIVE: To understand the operating System functionalities, System/ Software Requirement.

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
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
8. Simulate Paging Technique of memory management.

UNIX INTERNALS

1. a)Log into the system
b)Use vi editor to create a file called my file.txt which contains some text.
c)correct typing errors during creation.
d)Save the file
e)logout of the system
2. a)Log into the system b)open the file created in 1.b
c)Add some text, d) Change some text
e)Delete some text f)Save the changes
g)Logout of the system
3. a)Log into the system
b)Use the cat command to create a file. Call it mytable, use tabs to Separate the fields..



- c) Use the vi command to correct any errors in the file, mytable.
 - d) Use the sort command to sort the file mytable according to the first field.
 - e) Call the sorted file mytable (same name)
 - f) Print the file mytable
 - g) Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
 - h) Print the new file, mytable
 - i) Logout of the system.
4.
 - a) Login to the system
 - b) Use the appropriate command to determine your login shell
 - c) Use the /etc/passwd file to verify the result of step b.
 - d) Use the who command and redirect the result to a file called myfile1. Use the more command to see the output
 - e) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.
5.
 - a) Write a sed command that deletes the first character in each line in a file.
 - b) Write a sed command that deletes the character before the last character in each line in a file.
 - c) Write a sed command that swaps the first and second words in each line in a file.
6.
 - a) Pipe your /etc/passwd file to awk, and print out the home directory of each user.
 - b) Develop an interactive grep script that asks for a word and a file name and then tells how many lines contain that word.
 - c) Can solve by using awk
7. Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
8. Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.
9. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
10. Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.



11. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
12. Write a shell script to perform the following string operations:
 - i) To extract a sub-string from a given string.
 - li) To find the length of a given string.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**II Semester**

SCRIPTING LANGUAGES LAB PHP

PHP**Task-1:** Write a PHP script for the following.

- a. Find the biggest of 3 numbers.
- b. Find the factorial of a number (while loop)
- c. To reverse the digits of given number (Use do while)
- d. Find the sum of the digits of given number (Use for loop)
- e. Display the Fibonacci series for a particular limit. (Use for loop)
- f. Check the given letter is vowel or not.
- g. Check whether the given number is Prime or not.

Task-2

- a. Write a PHP script to create an associative array with book details and display.
- b. Write a PHP script to create an array and try with all array functions.

Task-3

- a. Write a PHP script to create Cookie, store a value “Ganesh” in the cookie.
- b. Write a PHP script to store, retrieve and delete data using session variables.
- c. Write a program for Cinema Ticketing. The audience age should be above 12 years, to get ticket. (apply the exception handling).

Task-4

- a. Write a PHP program to display the contents of a file using fgets, fgetc, fread functions.
- b. Write a PHP program to upload a file and display the contents in server.

Task-5: Create a registration form which contains fields name, Roll No, Gender and a submit button. All the details should be displayed in the server page when the user clicks the submit button.

Task-6

- a. Design a database in MYSQL using PHP. Create table in database.



Store, Update, Delete and Retrieve data from the table. Display the data from the table.

- b. Design a PHP application that will provide a form containing fields to fill book detail (Book title, Author, Publication, ISBN, Price and category). Display filled details to the user.

Task-7: Write a PHP script that will demonstrate POSIX regular expressions for validating

- i) Name ii) Pin Code iii) Date iv) Email-id.

Task-8

- a. Using PHP and MySQL, develop a program to accept book information viz . Accession number, title, authors, edition and publisher from a web page. Store the information in a database . Search for a book with the title specified by the user and display the search results with proper headings.
- b. Implement the above program using AJAX

PYTHON

Task-9: Write a Python script using basic data types.

- a. Find the biggest of 3 numbers.
- b. To check whether a number is positive or negative.
- c. Find the factorial of a number.
- d. To reverse the digits of a given number.
- e. Find the sum of the digits of a given number.
- f. Fibonacci series for a particular limit.

Task-10

- a. Write a Python script to test built in methods of Strings.
- b. Write a Python script to test various functions of List and Tuple.

Task-11

- a. Write a Python script to test various functions of Dictionary.
- b. Write a Python script to define a function and calling the function by passing arguments. (using pass by value & pass by reference).

Text Books

1. Beginning.PHP. And .MySQL. 3rd.Edition W. Jason Gilmore-Third Edition Apress publications
2. Python-Standard Library by Frederik Luth- O'Relly



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INSTITUTE OF ENGINEERING AND TECHNOLOGY

II B.Tech (CSE)**II Semester**

DESIGN AND ANALYSIS OF ALGORITHMS LAB

- Task-1:** a) Write a Java program to generate the permutations of a string.
b) Write a Java program to solve Towers of Hanoi Problem.
- Task-2:** Write Java programs to implement the following operations on disjoint sets
a) Union and Find
b) Weighted union and Collapsing Find
- Task-3 :** Write Java programs to implement the following for a given graph
a) Breadth first search
b) Depth first search
- Task-4:** Write a Java program to traverse a binary tree in
A) Pre-order
b) In-order
c) Post-order
- Task-5:** Write Java programs for sorting a given list of elements in ascending order using the following sorting methods
a) Quick sort b) Merge sort
- Task-6:** a) Write a Java program to multiply two matrices of order 4×4 using divide and conquer
b) Write a Java program to solve 0/1 knapsack problem using greedy method
- Task-7:** Write Java programs to generate a minimum cost spanning trees using the following algorithms
a) Prim's
b) Kruskal's
- Task-8:** a) Write a Java program to solve the single source shortest path problem using greedy method.
b) Write a Java program to find optimal ordering of matrix multiplication
(**Note:** Use Dynamic Programming Method)



Task-9: a) Write Java program that uses dynamic programming algorithm to find the cost of optimal binary search tree.

b) Write a Java program to solve 0/1 knapsack problem using dynamic programming

Task-10:

a) Write a Java program to implement dynamic programming algorithm to solve all pairs Shortest path problem

b) Write a Java program for solving travelling sales person problem using dynamic programming

Task-11: Consider the problem of eight queens on a chess board. Two queens are said to attack each other if they are on the same row, column or diagonal. Write a Java program that implements back tracking algorithm to solve the problem i.e., place eight non-attacking queens on the board.

Task-12:

a) Write a Java program for solving travelling sales persons problem using branch and bound algorithm.

b) Write a Java program to solve 0/1 knapsack problem using branch and bound algorithm.

Text Books

1. Ellis Horowitz, Satraj Sahni and S Rajasekharam, Fundamentals of Computer Algorithms, Galgotia publishers.
2. Parag Himanshu Dave, Himanshu Bhalchandra Dave, Design and Analysis algorithms Pearson Publication.

Reference Books

1. T H Cormen, C E Leiserson, and R L Rivest, Introduction to Algorithms, 2nd Edn, Pearson Education.
2. R C T Lee, Hang and T T Sai, Introduction to Design and Analysis of Algorithms, A strategic approach, TMH.



III-Year





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III B.Tech (CSE)**I Semester**

COMPILER DESIGN

UNIT-I

Overview of Compilation: Phases of Compilation – Lexical Analysis, 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.

Bottom up parsing : Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing , handling ambiguous grammar, YACC – automatic parser generator.

UNIT-III

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.

Symbol Tables : Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information .

UNIT-IV

Block structures and non block structure storage allocation: Static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

Code optimization: Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

UNIT-V

Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.



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. Principles of compiler design -A.V.Aho , J.D.Ullman, Pearson Education.
2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

Reference Books

1. Lex andYacc– John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Modern Compiler Design- Dick Grune, Henry E. Bal, Criel T. H. Jacobs, Wiley dreamtech.
3. Engineering a Compiler-Cooper and Linda, Elsevier.
4. Compiler Construction- Loudon, Thomson.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (CSE)**I Semester**

COMPUTER NETWORKS

UNIT-I

Introduction : OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks ,Arpanet, Internet, Network Topologies WAN, LAN, MAN.

Physical Layer : Transmission media, guided, unguided, switching and encoding asynchronous communications; Narrow band, broad band ISDN and ATM.

UNIT-II

Data link layer: Design issues, framing, error detection and correction, CRC, Elementary Datalink layer Protocol-stop and wait, Sliding Window, Slip, PPP, HDLC, Data link layer in Internet, ATM.

Medium Access sub layer : ALOHA, MAC addresses, Carrier sense multiple access. IEEE 802.X Standard Ethernet, wireless LANS, Bridges.

UNIT-III

Network Layer: Virtual circuit and Datagram subnets-Routing algorithm, shortest path routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing. Dynamic routing – Broadcast routing, Rotary for mobility. Congestion Control Algorithms – General Principles of Congestion prevention policies. Internet working: The Network layer in the internet and in the ATM Networks.

UNIT-IV

Transport Layer: Transport Services, Connection management, TCP and UDP protocols; ATMAAL Layer Protocol.

UNIT-V

Application Layer: Network Security, Domain name system, SNMP, TELNET, HTTP, Electronic Mail; the World WEB, Multi Media.

Network security: Symmetric, Asymmetric, DES, RSA algorithm.

Text Books

1. Computer Networks — Andrew S Tanenbaum, 4th Edition, Pearson Education/PHI
2. Data Communications and Networking – Behrouz A. Forouzan, Third Edition TMH.



Reference Books

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
2. Understanding communications and Networks- 3rd Edition, W.A. Shay, Thoms



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III B.Tech (CSE)**I Semester**

ADVANCED UNIX PROGRAMMING

UNIT-I

Unix Utilities-Introduction to Unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, cp, mv, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, ftp, telnet, text processing utilities and backup utilities, detailed commands to be covered are cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, comm, cmp, diff, tr, tar.

Working with the Bourne shell: what is a shell, shell responsibilities, pipes and input Redirection, output redirection, here documents, shell meta characters, shell variables, shell commands, the environment, control structures, shell script examples.

UNIT-II

Unix Files: Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, umask, dup, dup2. The standard I/O (fopen, fclose, fflush, fseek, fgetc, getc, fputc, putc, fgets, gets), formatted I/O, streams and file descriptors, file and directory maintenance (chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd), Directory handling system calls (opendir, readdir, closedir, rewinddir, seekdir, telldir)

UNIT-III

Unix Process and Signals: What is process, process structure, starting new process, waiting for a process, zombie process, process control, process identifiers, system call interface for process management-fork, vfork, exit, wait, waitpid, exec, system, Signals- Signal functions, unreliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, sleep functions.

UNIT-IV

Interprocess Communication Overview: Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, file and record locking, other unix locking techniques, pipes, FIFOs, streams and messages, namespaces, introduction to three types of IPC(system-V)-message queues, semaphores and shared memory.



UNIT-V

Message Queues-Unix system-V messages, unix kernel support for messages, unix APIs for messages, client/server example. Semaphores-Unix system-V semaphores, unix kernel support for semaphores, unix APIs for semaphores, file locking with semaphores. Shared Memory-Unix system-V shared memory, unix kernel support for shared memory, unix APIs for shared memory, semaphore and shared memory example.

Text Books

1. Unix the ultimate guide, Sumitabha Das, TMH
2. Unix Network Programming, W.R.Stevens, Pearson/PHI

Reference Books

1. Advanced Programming in the Unix environment, W.R.Stevens, Pearson education.
2. Unix system programming using C++, T.Chan, PHI
3. Unix for programmers and users, third edition, Graham Glass, King Ables, Pearson education.



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III B.Tech (CSE)**I Semester**

MICROCONTROLLERS

UNIT-I

Introduction and 8051 Architecture: Introduction to microcontrollers, comparing microprocessors and microcontrollers, 4,8,16 and 32 bit microcontrollers, Development systems for Microcontrollers, Architecture, Architecture of 8051, pin configuration of 8051 microcontroller, hardware input pins, output pins ports and external memory, counters and timers, serial data input and output and interrupts.

UNIT-II

Moving Data and Logical Operations: Introduction, Addressing modes, External Data moves, Code Memory Read-only Data Moves, PUSH and POP Op-codes, Data Exchanges, Logical Operations; Introduction, Byte-Level Logical Operations, Bit-Level Logical Operations, Rotate and Swap Operations.

UNIT-III

Arithmetic Operations, Jump and Call Op-codes: Introduction, Flags, Incrementing and Decrementing, Addition, Subtraction, Multiplication and Division, Decimal Arithmetic, Jump and Call op-codes, introduction, The jump and call program range, Jumps, Calls and Subroutines, Call and Returns, Interrupts and Returns.

UNIT-IV

8051 Microcontroller Design: Introduction, A microcontroller specification, A microcontroller Design, Testing the Design, Timing subroutines, Lookup Tables for the 8051, Serial Data Transmission.

UNIT-V

Applications and Serial Data Communication: Introduction, Keyboards, Displays, pulse Measurement, D/A and A/D Conversions, Multiple Interrupts, Serial data Communication, Introduction, Network Configurations, 8051 Data Communication Modes.

Text Books

1. Kenneth J. Ayala, The 8051 Microcontroller Architecture Programming and Applications, 2nd Edition, Penram International Publishers (I), 1996.

Reference Books

1. Mohammed Ari Mazidi and Janci Gillispie, The 8051 Microcontroller and Embedded Systems, Pearson Education Asia, New Delhi, 2003.



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III B.Tech (CSE)**I Semester**

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

UNIT-I

Introduction and Demand Analysis: Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

UNIT-II

Production and Cost Analysis: Production Function Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

UNIT-III

Markets and New Economic Environment: Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly.

Pricing: Objectives and Policies of Pricing. Methods of Pricing.

Business: Features and evaluation of different forms of Business Organisation, Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment: Changing Business Environment in Post-liberalization scenario.

UNIT-IV

Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital.

Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting, Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).

UNIT-V

Introduction to Financial Accounting and Financial Analysis: Accounting concepts and Conventions- Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance



Sheet with simple adjustments). Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, Capital structure Ratios and Profitability ratios. Du Pont Chart.

Text Books

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2009.
2. Atmanand: Managerial Economics, Excel, 2008.

Reference Books

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2009.
2. H. Craig Peterson and W. Cris Lewis, Managerial Economics, PHI, 2009.
Lipsey and Chrystel, Economics, Oxford University Press, 2009.



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INSTITUTE OF ENGINEERING AND TECHNOLOGY**

III B.Tech (CSE)**I Semester**

COMPILER DESIGN LAB

- Task-1:** Design a lexical analyzer for tokenizing an expression.
- Task-2:** Design a lexical analyzer to identify comment lines in a program.
- Task-3:** Implement brute force technique for a given grammar.
- Task-4:** Implement RDP for a given grammar.
- Task-5:** Find the first set of a given grammar.
- Task-6:** Find the follow set of a given grammar.
- Task-7:** Construct predictive parser for a given grammar.
- Task-8:** Design shift-reduce parser for a given grammar.
- Task-9:** Design operator precedence for a given grammar.
- Task-10:** Design LALR parser for a given grammar.
- Task-11:** Generate a three address code for a given expression.
- Task-12:** Generate an optimized three address code for a given expression.

Text Books

1. Principles of compiler design -A.V. Aho , J.D.Ullman, Pearson Education.
2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

Reference Books

1. Lex & Yacc John R. Levine, Tony Mason, Doug Brown, O'reilly
2. Modern Compiler Design- Dick Grune, Henry E. Bal, Criel T. H. Jacobs, Wileydreamtech.
3. Engineering a Compiler-Cooper & Linda, Elsevier.
4. Compiler Construction- Louden, Thomson.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (CSE)**I Semester**

ADVANCED UNIX PROGRAMMING LAB

1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.
10. Write a c program that makes a copy of a file using standard I/O and system calls
11. Implement in C the following UNIX commands using System calls
a. cat b. ls c. mv
12. Write a program that takes one or more file/directory names as command line input and reports the following information on the file.



- a. File type.
 - b. Number of links.
 - c. Time of last access.
 - d. Read, Write and Execute permissions.
13. Write a C program to emulate the UNIX `ls l` command.
 14. Write a C program to list for every file in a directory, its inode number and file name.
 15. Write a C program that demonstrates redirection of standard output to a file Ex: `ls > f1`.
 16. Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.
 17. Write a C program to create a Zombie process.
 18. Write a C program that illustrates how an orphan is created.
 19. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex: `- ls l | sort`
 20. Write C programs that illustrate communication between two unrelated processes using named pipe
 21. Write a C program to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
 22. Write a C program that receives the messages (from the above message queue as specified in (21)) and displays them.
 23. Write a C program to allow cooperating processes to lock a resource for exclusive use, using a) Semaphores b) flock or lockf system calls.
 24. Write a C program that illustrates suspending and resuming processes using signals.
 25. Write a C program that implements a producer-consumer system with two processes. (Using Semaphores).
 26. Write client and server programs (using c) for interaction between server and client processes using Unix Domain sockets.
 27. Write client and server programs (using c) for interaction between server and client processes using Internet Domain sockets.
 28. Write a C program that illustrates two processes communicating using shared memory



Text Books

1. Unix the ultimate guide, Sumitabha Das, TMH
2. Unix Network Programming, W.R.Stevens, Pearson/PHI

Reference Books

1. Advanced Programming in the Unix environment, W.R.Stevens, Pearson education.
2. Unix system programming using C++, T.Chan, PHI
3. Unix for programmers and users, third edition, Graham Glass, King Ables, Pearson education.



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III B.Tech (CSE)**I Semester**

MICROCONTROLLERS LAB

Task-1: LIST of experiments on 2G kit1.LED patterns

- a) Blinking LEDs, b)Serial lights,
- c) Half on/Half off, d)Alternate on/off

Task-2: Switches & LEDs

- a) Press switch to make corresponding LED on,
- b) Press switch to make corresponding LED off
- c) First switch press, last LED on,
- d) First switch press, last LED off

Task-3: LCD

- a) Character &string display on LCD,
- b) SW1-Display string1 on first line of LCD,
- c) SW2-Display string1 on first line of LCD, SW2

Task-4: UART

- a) Echo Program,
- b) Take command from PC & glow corresponding LED,
- c) Press Switch & display switch number on PC,
- d) Display data received by UART on LCD

Task-5: TRIAC

- a) 220V AC bulb switch on/off,
- b) 220V AC fan speed control with fixed step size,

Task-6: ADC

- a) Raw ADC value display on LCE,
- b) Raw ADC value display on Hyper Terminal
- c) Engineering unit conversion and display on LCD,
- d) Engineering unit conversion and display on Hyper Terminal,
- e) Limit checking for temperature value and switching on fan using triac,
- f) Limit checking for ambient light value and switching on light using triac.

Task-7: DAC

- a) Fixed step incremented DAC, output seen on multi-meter,



- d) DAC input value received from Hyper Terminal
- c) DAC input value taken from switches

Task-8: DC motor

- a) DC motor control-CW,CCW and stop using switches,
- b) DC motor control-CW,CCW and stop using commands received from Hyper Terminal

Task-9: ZigBee

- a) Receive data on ZigBee from PC ZigBee dongle and display data on LEDs
- b) Receive data on ZigBee from PC ZigBee dongle and display data on LCD
- c) Read ADC and transmit data using ZigBee
- d) Triac based control of fan and light using data received on ZigBee

Task-10: RF 433MHz

- a) Receive data on RF from another kit with RF transmitter. Connect PCs to both kits. Type in data in Hyper Terminal of Transmitter kit & see on Hyper Terminal of Receiver kit
- b) Read switches on transmitter kit, send their status on RF to receiver kit and control motor using switch status

Task-11: Bluetooth

- a) Transfer data to PC using Bluetooth,
- b) Receive data from PC using Bluetooth & display on LCD
- c) Transfer data from mobile phone(using a J2ME app) and receive using Bluetooth and control motor operation
- d) Transfer data from mobile phone(using a J2ME app) and receive using Bluetooth and control electrical appliance operation

Task-12: Ethernet

- a) Transfer data to PC using WIZI05SR and display on Hyper Terminal,
- b) Implement an embedded web server

Task-13: RTC

- a) Read and display RTC data on LCD,
- b) Read and display RTC data on Hyper Terminal,
- c) Set RTC using Hyper terminal and display data on Hyper Terminal,
- d) Implement an Event Logger with Time Stamp display

**Task-14: SDcard**

- a) Transfer data to PC, store on SDcard and retrieve it back(block transfer)
- b) Implement FAT file system on SDcard
- c) Implement data acquisition system and store data in a CSV file on SD card with time stamp

Note: A minimum of 12 (Twelve) experiments have to be performed and recorded by the candidate to attain eligibility for Practical Examination.



GOKARAJU RANGARAJU
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III B.Tech (CSE)**II Semester**

INFORMATION 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.

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-II

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

UNIT-III

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

UNIT-IV

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management, Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT-V

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats ,Firewall Design principles, Trusted System, Intrusion Detection Systems.

Text Books

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permeah, Wiley Dreamtech



Reference Books

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
6. Introduction to Cryptography, Buchmann, Springer.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (CSE)

II Semester

SOFTWARE ENGINEERING

UNIT-I

Introduction to Software Engineering: The evolving role of software, Changing Nature of 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. Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

UNIT-II

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT-III

Design Engineering: Design process and Design quality, Design concepts, the design model.

Creating an Architectural Design: Software architecture, Data design, Architectural styles and patterns, Architectural Design. Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT-IV

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, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.



UNIT-V

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.

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. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

Reference Books

1. Software Engineering- K.K. Agarwal and Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
3. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (CSE)

II Semester

MANAGEMENT SCIENCE

UNIT-I

Introduction to Management and Organisation: Concepts of Management and organization- nature, importance and Functions and Theories of Management, Systems Approach to Management, Leadership Styles, Social responsibilities of Management.

Designing Organisational Structures: Basic concepts related to Organisation - Departmentation and Decentralisation, Types and Evaluation of mechanistic and organic structures of organisation and suitability.

UNIT-II

Operations and Marketing Management: Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study - Basic procedure involved in Method Study and Work Measurement-Statistical Quality Control: control charts for Variables and Attributes, (simple Problems) and Acceptance Sampling, Deming's contribution to quality. Objectives of Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records - Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution.

UNIT-III

Human Resources Management (HRM): Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs PMIR. 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, Job Evaluation and Merit Rating.

UNIT-IV

Project Management (PERT/CPM): Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing (simple problems).

UNIT-V

Strategic Management and Contemporary Strategic Issues: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning



Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives.

Contemporary Management Practices: Basic concepts of MIS, End User Computing, Materials Requirement Planning (MRP), Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Supply Chain Management, Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering and Bench Marking, Balanced Score Card.

Text Books

1. Aryasri: Management Science, TMH, 2009.
2. Stoner, Freeman, Gilbert, Management, Pearson Education, 2009.

Reference Books

1. Kotler Philip and Keller Kevin Lane: Marketing Management, PHI, 2009
2. Koontz and Weihrich: Essentials of Management, TMH, 2009.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (CSE)**II Semester**

DATA WAREHOUSING AND DATA MINING

UNIT-I

Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining.

Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT-II

Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining, Data Cube Computation and Data Generalization, Efficient Methods for Data Cube Computation, Attribute-Oriented Induction.

UNIT-III

Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

UNIT-IV

Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Backpropagation, Support Vector Machines, Associative Classification, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor.

Cluster Analysis Introduction: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Outlier Analysis - Distance-Based Outlier Detection, Density-Based Local Outlier Detection.



UNIT-V

Mining Streams, Time Series and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Transactional Databases. Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

Text Books

1. Data Mining Concepts and Techniques - Jiawei Han and Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, Second Edition, 2006.
2. Introduction to Data Mining Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

Reference Books

1. Data Mining Techniques Arun K. Pujari, Second Edition, Universities Press.
2. Data Warehousing in the Real World, Sam Aanhory and Dennis Murray, Pearson Edn Asia.



GOKARAJU RANGARAJU
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III B.Tech (CSE)**II Semester**

MULTI-CORE COMPUTERS: ARCHITECTURE AND PROGRAMMING
(OPEN ELECTIVE)

UNIT-I

Introduction to Multi-core Architecture: Motivation, Parallel Computing Platforms, Differentiation between Hyper threading and Multi-Core architectures, Multi Threading on Single-Core and Multi-Core Platforms, Understanding the Performance.

System Overview on Threading: Definition, Application Programming Models and Threading, Virtual Environment.

UNIT-II

Programming Paradigms: Fundamental Concepts of Programming: Task Decomposition, Data Decomposition and Data Flow decomposition, Parallel Programming Patterns.

Threading and Parallel Programming Constructs : Synchronization, Critical sections, Deadlock, Synchronization Primitives, Flow-Control based Concepts

UNIT-III

Models: Threading APIs for Microsoft Windows, Microsoft .Net Framework, POSIX threads.

Open MP: Challenges in Threading a Loop, Data-race conditions, Performance Oriented Programming, Open MP Environment Variables, Compiling, Debugging.

UNIT-IV

Algorithm Structure Design Space: Introduction, Choosing an Algorithm Structure Pattern, Task Parallelism Pattern, Divide and Conquer Pattern, Recursive Data Pattern, Pipeline Pattern and Event Based Coordination Pattern. Basics of MPI: Getting Started, Basic Point-to-Point Message Passing, Collective Operations and Single Core Processor Fundamentals.

UNIT-V

Optimizations: Enhancing Parallelism, Dependence Analysis, Tiling for Locality and Communication, Aggregation for Communication. Load- Balancing Strategies, Virtualization. Speculative Parallelization, Transactional Memories. Bottlenecks, Small Critical Sections.



Text Books

1. Multi-Core Programming-: Increasing Performance through Software , by Shameem Akther and J. Roberts, Intel Press, 2006 Intel Corporation. (Unit I to Unit III)
2. Patterns for Parallel Programming, Timothy G. Mattson, Beverly A. Sanders, Berna L. Massingil, pearson education, 2004 (Unit III)
3. Patterns for Parallel Programming by T.G Mattson, A. Sanders, an
4. Parallel Programming: Techniques And Applications Using Networked Workstations And Parallel Computers, 2/E, Pearson Education India, 01-Sep-2006 (Unit V)

Reference Books

1. Introduction to High Performance Computing for Scientists and Engineers , Chapman and Hall/CRC Computational Science ,July 02, 2010 by CRC Press.
2. Computer Organization and Design, David A. Patterson, John L. Hennessy, Morgan Kaufmann Publishers, 1998.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (CSE)

II Semester

ARTIFICIAL INTELLIGENCE AND NEURAL NETWORKS
(OPEN ELECTIVE)

UNIT-I

Introduction: AI problems, foundation of AI and history of AI intelligent agents, Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

Searching: Searching for solutions, uniformed search strategies Breadth first search, depth first Search. Search with partial information (Heuristic search) Greedy best first search, A* search. Game Playing: Adversal search, Games, minmax, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search.

UNIT-II

Knowledge Representation & Reasons: logical Agents, Knowledge Based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward & Backward Chaining.

First order logic: Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.

UNIT-III

Characteristics of Neural Networks: Historical Development of Neural Networks Principles, Artificial Neural Networks: Terminology, Models of Neuron, Topology, Basic Learning Laws, Pattern Recognition Problem, Basic Functional Units, Pattern Recognition Tasks by the Functional Units.

UNIT-IV

Feedforward Neural Networks: Introduction, Analysis of pattern Association Networks, Analysis of Pattern Classification Networks, Analysis of pattern storage Networks. Analysis of Pattern Mapping Networks.

Feedback Neural Networks: Introduction, Analysis of Linear Auto-associative FF Networks, Analysis of Pattern Storage Networks.

UNIT-V

Competitive Learning Neural Networks & Complex pattern Recognition: Introduction, Analysis of Pattern Clustering Networks, Analysis of Feature mapping Networks, Associative Memory.



Text Books

1. Artificial Intelligence A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/ Pearson Education.
2. Artificial Neural Networks B. Yagna Narayana, PHI

Reference Books

1. Artificial Intelligence , 2nd Edition, E.Rich and K.Knight (TMH).
2. Artificial Intelligence and Expert Systems Patterson PHI.
3. Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson.
4. PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition Pearson Education.
5. Neural Networks Simon Haykin PHI
6. Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (CSE)

II Semester

PRINCIPLES OF PROGRAMMING LANGUAGES
(OPEN ELECTIVE)

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, Logic Programming. Programming Language Implementation: Compilation and Virtual Machines, 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.

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization.

UNIT-III

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation, mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions, user defined overloaded operators, co routines.

UNIT-IV

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95.



Concurrency: Subprogram level concurrency, semaphores, monitors, message passing, Java threads, C# threads.

Exception handling: Exceptions, Exception propagation, Exception handler in Ada, C++ and Java.

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

UNIT -V

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

Text Books

1. Concepts of Programming Languages Robert .W. Sebesta 6/e, Pearson Education.
- 2.. Programming Languages –Louden, Second Edition, Thomson.

Reference Books

1. Programming languages –Ghezzi, 3/e, John Wiley
2. Programming Languages Design and Implementation – Pratt and Zelkowitz, Fourth Edition PHI/Pearson Education.
3. Programming languages –Watt, Wiley Dreamtech.
4. LISP Patric Henry Winston and Paul Horn Pearson Education.
5. Programming in PROLOG Clocksin, Springer



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III B.Tech (CSE)**II Semester**

**DATA WAREHOUSING AND DATA MINING AND
INFORMATION SECURITY LAB**

INFORMATION SECURITY

- Task-1:** a) Write a program for Implementation of Play - Fair
b) Write a program Implementation of Vigenere cipher (Polyalphabetic substitution)
- Task-2:** a) Write a program Implementation of Hill cipher
b) Write a program Implementation of Ceasar cipher
c) Write a program Implementation of Rail Fence cipher
- Task-3:** Write a program Implementation of S-DES algorithm for data encryption.
- Task-4:** Implement RSA asymmetric(public key and private key)-Encryption. Encryption key (e, n) & (d, n)
- Task-5:** Write a program Study of MD5 hash function and implement the hash code using MD5
- Task-6:** Write a program Study of SHA-1 hash function and implement the hash code using SHA-1

DATA MINING AND DATA WAREHOUSING**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).
- Own_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 in judging a loan applicant. The goal is to classify the applicant into two categories: good or bad.

Task-7: List all the categorical (or nominal) attributes and the real-valued attributes separately. 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. 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. 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.

Task-8: 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? Why or Why not?

Task-9: 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? (10marks)

Task-10: 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.) 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)?

Task-11: 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? You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?

Task-12: (Extra Credit): How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules. PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one! Can you predict what attribute that might be in this dataset? One R classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and one R.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

III B.Tech (CSE)**II Semester**

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

INTRODUCTION

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use 'good' English and perform the following:

- Gather ideas and information, to organise ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

Objectives

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.

Syllabus

The following course content is prescribed for the Advanced Communication Skills Lab:



- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
- Group Discussion – dynamics of group discussion , intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Presentation Skills- Oral presentations (individual and group) through JAM sessions/seminars and written presentations through posters/ projects/ reports/ PPTs/ e-mails/ assignments etc.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

Minimum Requirement

The English Language Lab shall have two parts:

- i) The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.
- ii) The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component)

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

- i) P – IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM – 512 MB Minimum
 - c) Hard Disk – 80 GB
- ii) Headphones of High quality



Suggested Software

The software consisting of the prescribed topics elaborated above should be procured and used.

Suggested Software

Clarity Pronunciation Power – part II

- Oxford Advanced Learner's Compass, 7th Edition
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE(KAPLAN,AARCO&BARRONS,USA, Cracking GRE by CLIFFS)
- The following software from 'train2success.com'
- Preparing for being Interviewed,
- Positive Thinking,
- Interviewing Skills,
- Telephone Skills,
- Time Management
- Team Building,
- Decision making

English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

Text Book

1. Effective Technical Communication, M. Ashraf Rizvi, Tata Mc. Graw-Hill Publishing Company Ltd.
2. A Course in English communication by Madhavi Apte, Prentice-Hall of India, 2007. Communication Skills by Leena Sen, Prentice-Hall of India, 2005.
3. Academic Writing- A Practical guide for students by Stephen Bailey, Rontledge Falmer, London & New York, 2004.
4. English Language Communication : A Reader cum Lab Manual Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
5. Body Language- Your Success Mantra by Dr. Shalini Verma, S. Chand, 2006.



6. DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice, New Age International (P) Ltd., Publishers, New Delhi.
7. Books on TOEFL/GRE/GMAT/CAT by Barron's/cup
8. IELTS series with CDs by Cambridge University Press.
9. Technical Report Writing Today by Daniel G. Riordan & Steven E. Pauley, Biztantra Publishers, 2005.
10. Basic Communication Skills for Technology by Andra J. Rutherford, 2nd Edition, Pearson Education, 2007.
11. Communication Skills for Engineers by Sunita Mishra & C. Muralikrishna, Pearson Education, 2007.
12. Objective English by Edgar Thorpe & Showick Thorpe, 2nd edition, Pearson Education, 2007.
13. Cambridge Preparation for the TOEFL Test by Jolene Gear & Robert Gear, 4th Edition.
14. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.





IV-Year





GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

EMBEDDED SYSTEMS

UNIT-I

Introduction to Embedded Processors: Introduction to Embedded Computing, Issues and Challenges in Embedded system Design, Trends: SC, custom designed chips, configurable designed chips, configurable processors and multi-core processors.

Embedded processor architecture: General concepts, Instruction sets, Levels in architecture, Functional description-hardware/software trade-off, Introduction to RISC architecture, Pipelining, Instruction issue and execution, Instruction formats, Addressing modes, Data alignment and byte ordering.

UNIT-II

Devices and Buses for Devices Network: I/O Devices:- Types and Examples of I/O devices, Synchronous, Iso-synchronous and Asynchronous Communications from Serial Devices - Examples of Internal Serial-Communication Devices:- SPI, UART, Parallel Port Devices - Timer and Counting Devices Serial Communication using: 'I2C', 'USB', 'CAN'- Advanced I/O Serial high speed buses: ISA, PCI, PCI-X, cPCI and advanced buses.

UNIT-III

Programming Concepts and Embedded Programming in C, C++ : Programming in Assembly language (ALP) vs High Level Language, - C Program Elements:- Macros and functions, Use of Date Types, Structure, Pointers, Function Calls - Concepts of Embedded Programming in C++:- Objected Oriented Programming, Embedded Programming in C++, 'C' Program compilers Cross compiler Optimization of memory needs.

UNIT-IV

Real Time Operating Systems: Definitions of process, tasks and threads Inter Process Communication:- Shared data problem, Use of Semaphore(s), Priority Inversion Problem and Deadlock Situations, Message Queues, Mailboxes, Pipes, Virtual (Logical) Sockets, Remote Procedure Calls (RPCs), - Operating System Services:- Goals, Structures, Kernel, Process Management, Memory Management, Device Management - Real Time Operating System - RTOS Task scheduling models:- Co-operative Round Robin Scheduling, Cyclic Scheduling with Time Slicing.



UNIT-V

System Design Techniques: Design Methodologies, Requirement Analysis, Specification, System Analysis and Architecture Design. Design Examples:- Telephone PBX- System Architecture, Ink jet printer - Hardware Design and Software Design, Personal Digital Assistants, Set-top Boxes.

Text Books

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003.

Reference Books

1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes
2. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.
3. Frank Vahid and Tony Givargis, Embedded Systems Design A unified Hardware /Software Introduction, John Wiley, 2002.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT-I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle. Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

UNIT-II

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

Class and Object Diagrams: Terms, concepts, modeling techniques for Class and Object Diagrams.

UNIT-III

Basic Behavioral Modeling-I: Interactions, Interaction diagrams.

Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

UNIT-IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-V

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

Case Study: The Unified Library application

Text Books

1. The Unified Modeling Language User Guide, Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.
2. UML2 Toolkit, Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, WILEY-Dreamtech India Pvt. Ltd.



Reference Books

1. Fundamentals of Object Oriented Design in UML, Meilir Page-Jones, Pearson Education.
2. Modeling Software Systems Using UML2, Pascal Roques, WILEY-Dreamtech India Pvt. Ltd.
3. Object Oriented Analysis and Design, Atul Kahate, The McGraw-Hill Companies.
4. Practical Object-Oriented Design with UML, Mark Priestley, TATA McGrawHill.
5. Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

WEB TECHNOLOGIES

UNIT-I

HTML Common tags- List, Tables, images, forms, Frames, Cascading Style sheets, Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT-II

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors (DOM and SAX).

Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's

UNIT-III

Web Servers and Servlets: Tomcat web server, Introduction to Servlets, Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servelet Package, Reading Servlet parameters, Reading Initialization parameters, The javax.servelet HTTP package, Handling Http Request and Responses, Using Cookies-Session Tracking, Security Issues.

UNIT-IV

Introduction to JSP: The Problem with Servlet, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC Setting Up and JSP Environment, Installing the Java Software Development Kit, Tomcat Server and Testing Tomcat.

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages, Sharing Session and Application Data, Memory Usage Considerations

UNIT-V

Database Access : Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page, Application – Specific Database Actions, Deploying JAVA Beans in a JSP Page, Introduction to struts framework..



Text Books

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT s 1,2 ,3)
2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH (Chapters: 25) (UNIT 4)
3. Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 5,6,7,8)

Reference Books

1. Programming world wide web-Sebesta,Pearson
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
4. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly for chap 8.
5. Murach's beginning JAVA JDK 5, Murach, SPD
6. An Introduction to web Design and Programming –Wang-Thomson
7. Web Applications Technologies Concepts-Knuckles,John Wiley
8. Programming world wide web-Sebesta,Pearson
9. Web Warrior Guide to Web Programmimg-Bai/Ekedaw-Thomas
10. Beginning Web Programming-Jon Duckett WROX.
11. Java Server Pages, Pekowsky, Pearson.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

GEOGRAPHICAL INFORMATION SYSTEMS
(Elective-I)

UNIT-I

Conceptual Framework of GIS, GIS Structure and Function, Coordinate Systems. GIS Data.

UNIT-II

Database Design and Development, Function and Structure of Maps, Overview of Public Data Sources, Basic GIS Operations.

UNIT-III

Basic GIS Operations, Fundamentals of Data Visualization, Advanced Querying.

UNIT-IV

Linear Operations on Spatial Data, Spatial Modeling and Analysis, Data Visualization and Presentation for GIS, GIS Modeling, Spatial Interpolation.

UNIT-V

Error Evaluation and Management, GIS for Decision Making, GIS Organization and Management, GIS for Decision Making, GIS Applications, Internet GIS.

Text Books

1. Lo, C.P. and Yeung, A.K.W. (2002). Concepts and Techniques of Geographic Information Systems, Prentice Hall.

Reference Books

1. DeMers, M..N. (1999). Fundamentals of Geographic Information Systems. 2nd Ed., Wiley Press.
2. Burrough, P.A. and R.A. McDonald (1998). Principles of Geographical Information Systems. Oxford University Press.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)

I Semester

NATURAL LANGUAGE PROCESSING
(Elective-I)

UNIT-I

Components of natural language processing: lexicography, syntax, semantics,

Pragmatics: word level representation of natural languages prosody and natural languages.

UNIT-II

Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, Ambiguous grammars, resolution of ambiguities.

UNIT-III

Computation linguistics: recognition and parsing of natural language structures: ATN and RTN, General techniques of parsing: CKY, Earley and Tomitas algorithm.

UNIT-IV

Semantics-knowledge representation semantic networks logic and inference pragmatics, Graph models and optimization, prolog for natural language semantic.

Application of NLP: intelligent work processors: Machine translation ,user interfaces , Man- Machine interfaces, natural language querying, tutoring and authoring systems.

UNIT-V

Speech processing, components of speech recognition systems, Interactive voice response systems(IVRS), recognition commercial use of NLP.

Text Books

1. "Natural Language Understanding" James Allen ,Benjamin-1995, ~cummins Pub. Comp. Ltd., 2."Speech recognition systems"

Reference Books

1. "Language as a cognitive process", Terry Winograd 1983,AW
2. "Natural Language processing in prolog" G.Gazder, 1989, Addison Wesley.
3. "Introduction of Formal Language Theory", Mdlj Arbib and Kfaury, 198 SpringerVerlog



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

MOBILE COMPUTING
(Elective-I)

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 for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

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-III

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

Database Issues : Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT-IV

Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

UNIT-V

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.



Text Books

1. Jochen Schiller, "Mobile Communications", Addison-Wesley. (Chapters 4, 7, 9, 10, 11), second edition, 2004.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

Reference Books

1. Reza 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, second edition, 2003.
4. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003. Reference <http://www.jntu.ac.in/>



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

IMAGE PROCESSING AND PATTERN RECOGNITION
(Elective-II)

UNIT-I

Basic Concepts, Pattern Recognition Systems, Fundamental Problems in pattern recognition, system design, Design concepts and Methodologies – Character recognition – Speech recognition – Finger print Recognition – Pattern Recognition Model.

UNIT-II

Decision Functions – Linear Decision functions – Distance functions. Minimum distance classification, clustering concepts, Cluster seeking algorithms, Maximum distance, K- means Algorithms. Bayes classified decision function – For Baye's classifier Baye's Classifier for normal patterns. Trainable pattern classifiers – deterministic approach, perception approach reward – punishment concept.

UNIT-III

Gradient approach – Gradient Descent algorithms – LMSE Algorithms – Multi category classification. Trainable pattern classifiers, statistical approach – stochastic approximation methods, Robbin Minro algorithms – increment correction algorithms, LMSE algorithms. Syntactic patter recognition – formulation – syntax directed recognition – picture descript.

UNIT-IV

Digital Image fundamentals: Representation, elements – image transforms – Fast Fourier transform, DCT and DWT. Image enhancement- Spatial domain - frequency domain methods – Histogram, Modification techniques – Image Smoothing, image sharpening.

UNIT-V

Image encoding - Fidelity criteria, Encoding process, Mapping – Quantizer coder – Image Segmentation – Masks – Point detection – Line Detection – Edge Detection.

Text Books

1. Digital Image Processing – by R.C. Gonzalez & R.E. Woods, Addison Wesley.
2. Pattern Recognition Principles – J.T.TOU.R.C. Gonzalez, Addison Wesley.

Reference Books

1. Fundamentals of Digital Image Processing – by A.K. Jain, PHI Pearson Education



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

SOFTWARE TESTING METHODOLOGIES
(Elective-II)

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.

Transaction Flow Testing: Transaction flows, transaction flow testing techniques.

UNIT-III

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

Domain Testing: Domains and paths, Nice & ugly domains, Domain Testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT-IV

Paths, Path products and Regular expressions: Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

Logic Based Testing: Overview, decision tables, path expressions, kv charts, specifications.

UNIT-V

State, State Graphs and Transition testing: State graphs, good & bad state graphs, state testing, Testability tips.

Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, Node Reduction algorithm.



Text Books

1. Software Testing techniques - Baris Beizer, Dreamtech, second edition.
2. Software Testing Tools Dr.K.V.K.K.Prasad, Dreamtech.

Reference Books

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques SPD(Oreille)
3. Software Testing in the Real World Edward Kit, Pearson.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

DISTRIBUTED DATABASES
(Elective-II)

UNIT-I

Features of Distributed versus Centralized Databases, Principles Of Distributed Databases , Levels Of Distribution Transparency, Reference Architecture for Distributed Databases , Types of Data Fragmentation, Integrity Constraints in Distributed Databases.

Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT-II

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries.

The Management of Distributed Transactions, A Framework for Transaction Management , Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT-III

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

UNIT-IV

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution ,



Transaction Management, Transaction Management in Object DBMSs , Transactions as Objects.

UNI -V

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies

Text Books

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill

Reference Books

1. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez – Pearson Education.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

OBJECT ORIENTED ANALYSIS AND DESIGN LAB

The student should take up the case study of the below stated applications which were mentioned in the theory, and Model it in different views i.e., Use case view, logical view, component view, Deployment view.

Applications: Unified Library application
ATM application
Railway Reservation System

Task-1: Draw the class and object diagrams for the above applications.

Task-2: Draw the Use-case diagrams for the above applications.

Task-3: Draw the sequence diagrams for the above applications.

Task-4: Draw the collaboration diagrams for the above applications.

Task-5: Draw the activity diagrams for the above applications.

Task-6: Draw the State-chart diagrams for the above applications.

Task-7: Draw the component diagrams for the above applications.

Task-8: Draw the deployment diagrams for the above applications.

Task-9: Student should perform forward and Reverse Engineering, and Generate documentation of the project.

II. Student has to take up another case study of his/her own interest and do the same as mentioned in the first nine weeks.

Task-10: Draw the Interactive diagrams for their case study.

Task-11: Draw the Behavioral diagrams for their case study.

Task-12: Perform forward and reverse engineering for the above case study and generate a report of the same.

Text Books

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



GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)

I Semester

WEB TECHNOLOGIES LAB

1. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy free], Stylusstudio , etc.,
2. A database either Mysql or Oracle
3. JVM(Java virtual machine) must be installed on your system
4. BDK(Bea development kit) must be also be installed

Task -1

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

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	Description of the Web Site			

Fig 1.1

Login Page

This page looks like below:

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

CATALOGUE 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 ECE EEE CIVIL		Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	
		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	\$ 50	

Note: Week 2 contains the remaining pages and their description.



Task -2

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	Price	Quantity	Amount
	Java 2	\$35.5	2	\$70
	XML bible	\$40.5	1	\$40.5
	Total amount -			\$130.5

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)

Task-3

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.



Task-4

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>
```

Task-5

Write an XML file which will display the Book information which includes the following:

1. Title of the book
2. Author Name
3. ISBN number
4. Publisher name
5. Edition
6. Price

Write a Document Type Definition (DTD) to validate the above XML file.
Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns. Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.
Hint: You can use some xml editors like XML-spy

Task-6

Visual Beans

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window".

Task-7

1. Install TOMCAT web server and APACHE.
While installation assign port number 4040 to TOMCAT 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)

Task-8

User Authentication :

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servlet 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. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

Task-9

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).Practice 'JDBC' connectivity.

Write a java program/servlet/JSP 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).

Task-10

Write a JSP 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).



Task-11

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 JDBC.

Task-12

HTTP is a stateless protocol. Session is required to maintain the state. The user may add some items to cart from the catalog 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 JSP pages to achieve the above mentioned functionality using sessions.



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INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**I Semester**

EMBEDDED SYSTEMS LAB

Task-1: Voltage Measurement

Design a voltmeter to measure voltage from 0 to 5 volts and display on 2 digits, 7 segment displays

Task-2: Water Pump Controller

Design a water pump controller by sensing the low and high level in water tank

Task-3: Digital Clock

Design a digital clock, using LCD display

Task-4: Temperature Measurement

Design a Thermometer, using LM35 and 2 digits, 7 segment displays

Task-5: PC Communication

Interface the microcontroller to a PC through RS232 interface. Display messages sent by the microcontroller on the PC using Visual Basic program running in PC

Task-6: Remote Control through FM Link

Establish a remote link between two microcontrollers using FM transmitter and receiver. Exchange messages between the two microcontrollers.

Task-7: Hot Chamber Controller

Design a hot chamber to maintain the temperature say at 40 degrees centigrade.

Task-8: Obstacle Detector through Ultra Sonic

Design a obstacle detection system using ultrasonic transmitter receiver.

Task-9: Sprinkler Controller

Design a moisture sensor and sprinkler controller

Task-10: Lamp Controller

Design a light sensor and a timer to control a lamp for 3, 4 or 8 hours.



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IV B.Tech (CSE)**II Semester**

NETWORK PROGRAMMING

UNIT-I

Introduction to Network Programming: OSI model, Unix standards, TCP and UDP and TCP connection establishment and Format, Buffer sizes and limitations, standard internet services, Protocol usage by common internet application.

Sockets: Address structures, value – result arguments, Byte ordering and manipulation function and related functions.

UNIT-II

Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related functions.

TCP client server : Introduction, TCP Echo server functions, Normal startup, terminate and signal handling, server process termination, Crashing and Rebooting of server host, shutdown of server host.

UNIT-III

I/O Multiplexing and socket options: I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPv6 socket option ICMPv6 socket option IPv6 socket option and TCP socket options.

UNIT-IV

Elementary UDP sockets: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP. Elementary name and Address conversions: DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

UNIT-V

IPC : Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores. Remote Login: Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.



Text Books

1. UNIX Network Programming, Vol. I, Sockets API, 2nd Edition. - W.Richard Stevens, Pearson Edn. Asia.
2. UNIX Network Programming, 1st Edition, - W.Richard Stevens. PHI.

Reference Books

1. UNIX Systems Programming using C++ T CHAN, PHI.
2. UNIX for Programmers and Users, 3rd Edition Graham GLASS, King abls, Pearson Education.
3. Advanced UNIX Programming 2nd Edition M. J. ROCHKIND, Pearson Education.



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INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)

II Semester

SOFTWARE PROJECT MANAGEMENT
(Elective-III)

UNIT-I

Conventional Software Management : The waterfall model, conventional software Management performance.

Evolution of Software Economics : Software Economics, pragmatic software cost estimation.

Improving Software Economics : Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

UNIT-II

Life cycle phases: Engineering and production stages, inception, Elaboration, construction, transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

Model based software architectures: A Management perspective and technical perspective.

Work Flows of the process: Software process workflows, Iteration workflows,

UNIT-III

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT-IV

Project Organizations and Responsibilities : Line-of-Business Organizations, Project Organizations, evolution of Organizations.

Process Automation : Automation Building blocks, The Project Environment.



UNIT - V

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process : Process discriminants.

Future Software Project Management : 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. Software Project Management, Walker Royce: Pearson Education, 2005.

Reference Books

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.



GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**II Semester**

INFORMATION RETRIEVAL SYSTEMS
(Elective-III)

UNIT-I

Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses.

Information Retrieval System Capabilities: Search, Browse, Miscellaneous.

UNIT-II

Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction.

Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

UNIT-III

Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages

Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

UNIT-IV

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext.

Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT-V

Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example TREC results.



Text Books

1. Information Retrieval Systems: Theory and Implementation, Kowalski, Gerald, Mark T Maybury, Kluwer Academic Press, 1997.

Reference Books

1. Information Retrieval Data Structures and Algorithms, Frakes, W.B., Ricardo Baeza-Yates, Prentice Hall, 1992.
2. Modern Information Retrieval, By Yates Pearson Education.
3. Information Storage & Retrieval, By Robert Korfhage John Wiley & Sons.



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IV B.Tech (CSE)**II Semester**

MOBILE APPLICATION DEVELOPMENT
(Elective-III)

UNIT-I

J2ME Overview: Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices. Small Computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants.

J2ME Architecture and Development Environment: J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit.

UNIT-II

J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices, Commands, Items, and Event Processing, J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling.

UNIT-III

High-Level Display Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class.

Low-Level Display Canvas : The Canvas, User Interactions, Graphics, Clipping Regions, Animation.

Record Management System: Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener.

UNIT-IV

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data from a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWS.



UNIT-V

Generic Connection Framework: The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process

Text Books

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.

Reference Books

1. Enterprise J2ME: Developing Mobile Java Applications, Michael Juntao Yuan, Pearson Education, 2004.
2. Beginning Java ME Platform, Ray Rischpater, Apress, 2009.
3. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005.
4. Kicking Butt with MIDP and MSA: Creating Great Mobile Applications, First Edition, J.Knudsen, Pearson.



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IV B.Tech (CSE)**II Semester**

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.

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-II

Design process Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT-III

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-IV

Develop System Menus and Navigation Schemes - Select the Proper Kinds of Windows - Select the Proper Device-Based Controls - Choose the Proper Screen Based Controls

UNIT-V

Write Clear Text and Messages - Create Meaningful Graphics, Icons and Images- Choose the Proper Colors- Test, and Retest.

Interaction Devices Keyboard and function keys pointing devices speech recognition digitization and generation image and video displays drivers

Text Books

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



Reference Books

1. Human Computer Interaction. ALAN DIX, JANET FINCAY, GREGORY D. ABOWD, RUSSELL BEALG, PEARSON.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,
3. User Interface Design, Soren Lauesen , Pearson Education.



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IV B.Tech (CSE)**II Semester**

DESIGN PATTERNS
(Elective-IV)

UNIT-I

Introduction : What Is a Design Pattern?, Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT-II

A Case Study : Designing a Document Editor : Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary .

UNIT-III

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.
Structural Pattern Part-I : Adapter, Bridge, Composite.

UNIT-IV

Structural Pattern Part-II : Decorator, Façade, Flyweight, Proxy.
Behavioral Patterns Part-I : Chain of Responsibility, Command, Interpreter, Iterator.

UNIT-V

Behavioral Patterns Part-II : Mediator, Memento, Observer, State, Strategy, Template Method ,Visitor, Discussion of Behavioral Patterns. What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

Text Books

1. Design Patterns By Erich Gamma, Pearson Education

Reference Books

1. Pattern's in JAVA Vol-I By Mark Grand ,Wiley DreamTech.
2. Pattern's in JAVA Vol-II By Mark Grand ,Wiley DreamTech.
3. JAVA Enterprise Design Patterns Vol-III By Mark Grand ,Wiley DreamTech.



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IV B.Tech (CSE)**II Semester**

CLOUD COMPUTING
(Elective-IV)

UNIT-I

Foundations: Introduction to Cloud Computing, Migrating into a Cloud Enriching the 'Integration as a Service' Paradigm for the Cloud Era, Cloud Computing for Enterprise Applications

UNIT-II

Infrastructure as a Service (IaaS): Virtual Machines Provisioning and Migration Services, Management of Virtual Machines for Cloud Infrastructures, Enhancing Cloud Computing Environments using a Cluster as a Service, Secure Distributed Data Storage in Cloud Computing

UNIT-III

Platform and Software as a Service (PaaS): Aneka Integration of Private and Public Clouds, Comet Cloud: An Autonomic Cloud Engine, T-Systems, Cloud-Based Solutions for Business Applications, Workflow Engine for Clouds, Understanding Scientific Applications for Cloud Environments, The Map Reduce Programming Model and Implementations

UNIT-IV

Monitoring and Management: Architecture for Federated Cloud Computing, SLA Management in Cloud Computing: A Service Provider's Perspective, Performance Prediction for HPC on Clouds

UNIT-V

Applications: Architecting Applications for the Amazon Cloud, Massively Multiplayer Online Game, Hosting on Cloud Resources, Building Content Delivery Networks Using Clouds, Resource Cloud Mashups

Text Books

1. "Cloud Computing: Principles and Paradigms", Raj Kumar Buyya, James Bromberg, Andrej Kosciusko, Wiley, New York, USA



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INSTITUTE OF ENGINEERING AND TECHNOLOGY

IV B.Tech (CSE)**II Semester**

NETWORK PROGRAMMING LAB

OBJECTIVES: To teach students various forms of IPC through Unix and socket Programming

Recommended Systems/Software Requirements: Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space LAN Connected Any flavour of Unix / Linux

Task-1: Implement the following forms of IPC.

- a) Pipes b) FIFO

Task-2: Implement file transfer using Message Queue form of IPC.

Task-3: Write a programme to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use semaphores to avoid race conditions.

Task-4: Design a Client and server application to transfer the given input file. (without using transport layer protocols)

Task-5: Design TCP iterative Client and server application to reverse the given input sentence.

Task-6: Design TCP client and server application to transfer file.

Task-7: Design a TCP concurrent server to convert a given text into upper case using multiplexing system call "select".

Task-8: Design a TCP concurrent server to echo given set of sentences using poll functions.

Task-9: Design UDP Client and server application to reverse the given input sentence.

Task-10: Design UDP Client server to transfer a file.

Task-11: Design using poll client server application to multiplex TCP and UDP requests for converting a given text into upper case.



Task-12: Design a RPC application to add and subtract a given pair of integers.

Reference Books

1. Advance Unix Programming Richard Stevens, Second Edition Pearson Education.
2. Advance Unix Programming, N.B. Venkateswarlu, BS Publication.