COMPUTER SCIENCE AND ENGINEERING

General, Course structure & Theme & Semester-wise credit distribution

A. Definition of Credit:

1	Hr. Lecture (L) per week	1 credit
1	Hr. Tutorial (T) per week	1 credit
1	Hr. Practical (P) per week	0.5 credit
2	Hours Practical(Lab)/week	1 credit

B. Structure of Undergraduate Engineering program:

S.No.	Category	Credit Breakup (Total 160)
1	Humanities and Social Sciences including Management Courses	14
2	Basic Science courses	21
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	24
4	Professional core courses	61
5	Professional Elective courses relevant to chosen specialization/branch	18
6	Open subjects – Electives from other technical and /or emerging subjects	11
7	Project work, seminar and internship in industry or elsewhere	11
8	Mandatory Courses [Environmental Studies, Indian Constitution, Essence of Indian Traditional Knowledge]	(non-credit)
	Total	**160**

C.Course code and Definitions

Course code	Definitions
BSC	Basic Science Courses
ESC	Engineering Science Courses
HSMC	Humanities and Social Sciences including Management courses
PCC	Professional core courses
PEC	Professional Elective courses
OEC	Open Elective courses
LC	Laboratory course
MC	Mandatory courses
PROJ	Project

HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT COURSES

S.No	Code	Subject	Semester	Credits
1	18CS1T01	English-I	I	2
2	18CS1L06	Communication Skills Lab	I	1
2	18CS2T01	English-II	II	2
3	18CS3T05	Effective Technical Communication	III	3
4	18CS4T05	Managerial Economics and Financial Analysis	IV	3
5	18CS4T06	Professional Ethics	IV	3
Total Credits				**14**

BASIC SCIENCE COURSES

S.No	Code	Subject	Semester	Credits
1	18CS1T02	Linear Algebra &Differential	I	4
2	18CS1T03	Applied Physics	I	3
3	18CS1L07	Applied Physics Lab	I	1.5
4	18CS2T02	Vector Calculus & Fourier Transforms	II	3
5	18CS2T03	Applied Chemistry	II	3
6	18CS2T04	Biology for Engineers	II	2
7	18CS2L07	Applied Chemistry Lab	II	1.5
8	18CS3T01	Probability & Statistics	III	3
Total Credits				**21**

ENGINEERING SCIENCE COURSES

S.No	Code	Subject	Semester	Credits
1	18CS1T04	Introduction to Programming & problem Solving	I	3
2	18CS1T05	Engineering Graphics	I	3
3	18CS1L08	Problem Solving Lab	I	1.5
4	18CS2L09	IT Workshop	I	1
5	18CS2T05	Basic Electrical & Electronics Engineering	II	3
6	18CS2T06	Data Structures	II	4
7	18CS2L08	Data Structures Lab	II	1.5
8	18CS3T04	Digital Logic Design	III	3
9	18CS3L09	R Programming Lab	III	2
10	18CS4L09	Python Programming Lab	IV	2
Total Credits				**24**

PROFESSIONAL ELECTIVE COURSES

S.No	Code	Subject	Semester	credits
1	18CS5T05/6/7	Program Elective-I	V	3
2	18CS5T08/9/10	Program Elective-II	V	3
3	18CS6T04/5/6	Program Elective-III	VI	3
4	18CS6T07/8/9	Program Elective-IV	VI	3
5	18CS7T03/4/5	Program Elective-V	VII	3
6	18CS7T06/7/8	Program Elective-VI	VII	3
Total Credits				**18**

OPEN ELECTIVE COURSES

S.No	Code	Subject	Semester	Credits
1	18CS6T10/11/12	Open Elective-I	VI	3
2	18CS7T09/10/11	Open Elective-II	VII	3
3	18CS7T12/13/14	Open Elective-III	VII	3
4	18CS8T01	Open Elective-IV	VIII	2
Total Credits				**11**

PROFESSIONAL CORE COURSES

S.No	Code	Subject	Semester	Credits
1	18CS3T02	Object Oriented Programming	III	3
2	18CS3T03	Advanced Data Structures	III	3
3	18CS3L07	Object Oriented Programming Lab	II	2
4	18CS3L08	Advanced Data Structures Lab	III	2
5	18CS4T01	Discrete Mathematics	IV	2
6	18CS4T02	Database Management Systems	IV	3
7	18CS4T03	Computer Organization & Architecture	IV	2
8	18CS4T04	Operating Systems	IV	3
9	18CS4L07	Operating Systems & linux programming Lab	IV	2
10	18CS4L08	Database Management Systmes Lab	IV	2
11	18CS5T01	Data Mining & Warehousing	V	3
12	18CS5T02	Web Technologies	V	3
13	18CS5T03	Design and Analysis of Algorithms	V	3
14	18CS5T04	Formal Languages & Automata Theory	V	3
15	18CS5L12	Data Mining Lab	V	2
16	18CS5L13	Web Technologies Lab	V	2

17	18CS6T01	Compiler Design	VI	3
18	18CS6T02	Computer Networks	VI	3
19	18CS6T03	Software Engineering	VI	3
20	18CS6L13	Computer Networks Lab	VI	2
21	18CS6L14	Software Engineering Lab	VI	2
22	18CS7T01	Big Data & Hadoop	VII	3
23	18CS7T02	Cryptography & Network Security	VII	3
24	18CS7L15	Big Data & Hadoop Lab	VII	2
Total Credits				**61**

PROJECT

S.No	Code	Subject	Semester	Credits
1	18CS3L10	Technical Seminar	III	**1**
2	18CS7L16	Mini Project /Internship	VII	**2**
3	18CS8L02	Major Project	VIII	**8**
Total Credits				**11**

MANDATORY COURSE (No Credits)

S.No	Code	Subject	Semester	Credits
1	18CS2T09	Environmental Studies	II	-
2	18CS3T06	Indian Constitution	III	-
3	18CS5T11	Essence of Indian Traditional Knowledge	V	-

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course Structure for I Year, Semester- I (1st Semester)

S.No	Course Code	Course Category	Course Title	Hours per week			Total Contact Hours	Credits
				Lecture	Tutorial	Practical		
1	18CS1T01	HSMC	English-I	2	-	-	2	2
2	18CS1T02	BSC	Linear Algebra &Differential Equations	3	1	-	4	4
3	18CS1T03	BSC	Applied Physics	3	-	-	3	3
4	18CS1T04	ESC	Introduction to Programming & problem Solving	3	-	-	3	3
5	18CS1T05	ESC	Engineering Graphics	3	-	-	3	3
6	18CS1L06	HSMC	Communication Skills Lab	-	-	2	2	1
7	18CS1L07	BSC	Applied Physics Lab	-	-	3	3	1.5
8	18CS1L08	ESC	Problem Solving Lab	-	-	3	3	1.5
9	18CS2L09	ESC	IT Workshop	-	-	2	2	1
							Total Number of Credits	**20**

Course Structure for I Year, Semester- II(2nd Semester)

S.No	Course Code	Course Category	Course Title	Hours per week			Total Contact Hours	Credits
				Lecture	Tutorial	Practical		
1	18CS2T01	HSMC	English-II	1	-	**2**	3	2
2	18CS2T02	BSC	Vector Calculus & Fourier Transforms	3	-	-	3	3
3	18CS2T03	BSC	Applied Chemistry	3	-	-	3	3
4	18CS2T04	BSC	Biology for Engineers	2	-	-	2	2
5	18CS2T05	ESC	Basic Electrical & Electronics Engineering	3	-	-	3	3
6	18CS2T06	ESC	Data Structures	3	1	-	4	4
7	18CS2L07	BSC	Applied Chemistry Lab	-	-	3	3	1.5
8	18CS2L08	ESC	Data Structures Lab	-	-	3	3	1.5
9	18CS2T09	MC	Environmental Studies	-	-	2	2	-
							Total Number of Credits	**20**

Course Structure for II Year, Semester- I(3rd Semester)

S.No	Course Code	Course Category	Course Title	Hours per week			Total Contact Hours	Credits
				Lecture	Tutorial	Practical		
1	18CS3T01	BSC	Probability & Statistics	3			3	3
2	18CS3T02	PCC	Object Oriented Programming	3			3	3
3	18CS3T03	PCC	Advanced Data Structures	3			3	3
4	18CS3T04	ESC	Digital Logic Design	3			3	3
5	18CS3T05	HSMC	Effective Technical Communication	3			3	3
6	18CS3L07	PCC	Object Oriented Programming Lab			4	2	2
7	18CS3L08	PCC	Advanced Data Structures Lab			4	2	2
8	18CS3L09	ESC	R programming Lab			4	2	2
9	18CS3T06	MC	Indian Constitution	2			2	--
10	18CS3L10	P	Technical Seminar	1			1	1
							Total Number of Credits	**22**

Course Structure for II Year, Semester- II(4th Semester)

S.No	Course Code	Course Category	Course Title	Hours per week			Total Contact Hours	Credits
				Lecture	Tutorial	Practical		
1	18CS4T01	PCC	Discrete Mathematics	2			2	2
2	18CS4T02	PCC	Database Management Systems	3			3	3
3	18CS4T03	PCC	Computer Organization & Architecture	2			2	2
4	18CS4T04	PCC	Operating Systems	3			3	3
5	18CS4T05	HSMC	Managerial Economics and Financial Analysis	3			3	3
6	18CS4T06	HSMC	Professional Ethics	3			3	3
7	18CS4L07	PCC	Operating Systems & linux programming Lab			4	2	2
8	18CS4L08	PCC	Database Management Systems Lab			4	2	2
9	18CS4L09	ESC	Python Programming Lab			4	2	2
							Total Number of Credits	**22**

Course Structure for III Year, Semester- I(5th Semester)

S.No	Course Code	Course Category	Course Title	Hours per week			Total Contact Hours	Credits
				Lecture	Tutorial	Practical		
1	18CS5T01	PCC	Data Mining & Warehousing	2	1		3	3
2	18CS5T02	PCC	Web Technologies	3			3	3
3	18CS5T03	PCC	Design and Analysis of Algorithms	2	1		3	3
4	18CS5T04	PCC	Formal Languages & Automata Theory	3			3	3
5	18CS5T05/6/7	PEC	Program Elective-I	2	1		3	3
6	18CS5T08/9/10	PEC	Program Elective-II	3			3	3
7	18CS5L12	PCC	Data Mining Lab			4	2	2
8	18CS5L13	PCC	Web Technologies Lab			4	2	2
9	18CS5T11	MC	Essence of Indian Traditional Knowledge	2			2	--
							Total Number of Credits	**22**

Course Structure for III Year, Semester- II(6th Semester)

S.No	Course Code	Course Category	Course Title	Hours per week			Total Contact Hours	Credits
				Lecture	Tutorial	Practical		
1	18CS6T01	PCC	Compiler Design	2			2	3
2	18CS6T02	PCC	Computer Networks	2			2	3
3	18CS6T03	PCC	Software Engineering	3			3	3
4	18CS6T04/5/6	PEC	Program Elective-III	2	1		3	3
5	18CS6T07/8/9	PEC	Program Elective-IV	2	1		3	3
6	18CS6T10/11/12	OEC	Open Elective-I	3			3	3
7	18CS6L13	PCC	Computer Networks Lab			4	2	2
8	18CS6L14	PCC	Software Engineering Lab			4	2	2
							Total Number of Credits	**22**

Proposed Course Structure for IV Year, Semester- I(7th Semester)

S.No	Course Code	Course Category	Course Title	Hours per week			Total Contact Hours	Credits
				Lecture	Tutorial	Practical		
1	18CS7T01	PCC	Big Data & Hadoop	3			3	3
2	18CS7T02	PCC	Cryptography & Network Security	3			3	3
3	18CS7T03/4/5	PEC	Program Elective-V	2	1		3	3
4	18CS7T06/7/8	PEC	Program Elective-VI	2	1		3	3
5	18CS7T09/10/11	OEC	Open Elective-II	3			3	3
6	18CS7T12/13/14	OEC	Open Elective-III	3			3	3
7	18CS7L15	PCC	Big Data & Hadoop Lab			4	2	2
8	18CS7L16	P	Mini Project /Internship			4	2	2
							Total Number of Credits	**22**

Course Structure for IV Year, Semester- II(8th Semester)

S.No	Course Code	Course Category	Course Title	Hours per week			Total Contact Hours	Credits
				Lecture	Tutorial	Practical		
1	18CS8T01	OEC	Open Elective-IV	2			2	2
2	18CS8L02	**P**	Major Project			16	8	8
							Total Number of Credits	**10**

List of Elective Courses

Professional Elective Courses	Open Elective Courses
1. Object Oriented Analysis and Design 2. Unix & Shell Programming 3. Soft Computing 4. Advanced Computer Architecture 5. Cloud Computing 6. Artificial Intelligence & Neural Networks 7. Software Testing Methodologies 8. Human Computer Interaction 9. Mobile Computing 10. Distributed Systems 11. Machine Learning & Deep Learning 12. Software Project Management 13. Data Analytics 14. Adhoc and Sensor Networks 15. Internet of Things 16. Advanced Operating Systems 17. Embedded Systems 18. Image Processing	1. Soft skills and Inter personal communications 2. Human Resource Development & Organizational Behavior 3. Disaster Management 4. Creativity Innovation and New Product development 5. Pollution Control 6. Non-conventional Energy resources 7. Cyber Law & Ethics 8. Economic Policies in India 9. Finance for Non-Finance Executives 10. Film Studies 11.Digital Marketing 12. Nano Technology 13. Cost Managemnet of Engineering Projects 14. Value Education 15. Pedagogy Studies 16. MOOCS course

I YEAR
SEMESTER-I
SYLLABUS

ENGLISH-1

I Year – I Semester

Lecture: 2 Practical: 0 Internal Marks: 30

Credits: 2 Tutorial: 0 External Marks: 70

Prerequisites: -

Course Outcomes

CO 1: Use English language, both written and spoken, competently and correctly.

CO 2: Improve comprehension and fluency of speech.

CO 3: Gain confidence in using English in verbal situations.

CO 4: Hone the communication skills to meet the challenges of their careers very successfully.

CO 5: Strengthen communication skills in different contexts like formal and informal.

CO 6: Develop knowledge of different fields and serve the society accordingly

Syllabus:

Unit 1 Human Resources : Ideal Family

Unit 2 In London:Verger

Unit 3 Our Living Environment: Three Days to See

Unit 4 Energy: Alternative Sources: War

Unit 5 Principles of Good Writing : Letter Writing

References:

1. English for Engineers and Technologists, Orient Blackswan
2. Prose for Communication, Ravindra Publishing House
3. Panorama, Oxford University Press

LINEAR ALGEBRA & DIFFERENTIAL EQUATIONS

I Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 4	Tutorial: 1	External Marks: 70

Prerequisites: -

Course Outcomes:

1. Apply the knowledge to solve a system of homogeneous and non homogeneous linear equations
2. Illustrate the methods of computing eigen values and eigen vectors
3. Able to analyze the real life situations, formulate the differential equations then apply the solving methods
4. Explain the techniques of solving the linear differential equations
5. Optimize functions of several variables and able to find extreme values of constrained functions

Syllabus:

UNIT I: Linear systems of equations, Eigen values & Eigen vectors

Rank of a matrix, Echelon form, Normal form, PAQ is in normal form, linear dependence and independence, Consistency of linear system of equations, System of linear homogeneous equations. Gauss -Jordan method, LU decomposition method,

Application: Finding the current inelectrical circuits, Eigen values, Eigen vectors, Properties of Eigen values(without proofs).

UNIT II: Quadratic forms & Differential calculus:

Cayley-Hamilton theorem(without proof), Reduction to diagonal form, Reduction of quadratic form to canonical form, Nature of quadratic form. Limits and continuity and differentiability, Mean value theorems, Taylor's and Maclaurin's series. Functions of two variables, Partial derivatives, Homogeneous functions, Total derivative, Jacobian, Taylor's theorem for functions of two variables.

Applications: Maxima and Minima of functions of two variables, Lagrange's method of undetermined multipliers.

UNIT III: Differential equations of first order:

Formation of a differential equation, Solution of a differential equation, Variables separable method, Linear equations, Bernoulli's equation, Exact differential equations.Equations reducible to exact equations.

Applications: Orthogonal Trajectories, Newton's Law of cooling, Rate of decay & growth.

UNIT IV: Differential equations higher order:

Definitions, Complete solution, Operator D, Rules to find Complementary function, Inverse operator, Rules to find the particular integral(RHS term of the type e^{ax} , Sin(ax+b), cos(ax+b), polynomials in x).Rules to find the particular integral(RHS term of the type e^{ax} V(x), any other function), Method of variation of parameters. **Application:** L-C-R circuits.

UNIT V: Laplace Transforms (all properties without proofs):

Definition, Transforms of elementary functions, properties of Laplace transforms, Transforms of periodic functions, Transforms of derivatives and integrals, Multiplication by t^n, Division by t. Inverse Laplace transforms–Method of partial fractions, other methods of finding inverse transforms, Convolution theorem (without proof). **Application**: Application to differential equations.

Text Books:

1. **B. S. GREWAL,** Higher Engineering Mathematics, Khanna Publishers**,** 43rd Edition, 2014.
2. **B. V. RAMANA,** Higher Engineering Mathematics, Tata MC Graw Hill, 1st Edition, 2007.

Reference Books:

1. . P. BALI & Dr. MANISH GOYAL, A Text book of Engineering Mathematics, Lakshmi Publications, 9th Edition, 2014.

2. ERWIN KREYSZIG, Advanced Engineering Mathematics, John Wiley & Sons, 10th Edition, 2015.

APPLIED PHYSICS

I Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

Prerequisites: -

Course Outcomes

1: Study of lasers and optical fibers with an emphasis of their application in communication in particular.

2: Outline the principles of Quantum mechanics to understand the principles of solid state materials for use in engineering applications.

3: The Analytical study of response of materials to Electromagnetic fields.

4: To study various magnetic and dielectric materials and their Engineering applications.

5: To Gain knowledge on the physics of semiconductors for their engineering applications.

SYLLABUS

UNIT –I

LASERS

Characteristics of Lasers – Spontaneous and Stimulated Emission – Population Inversion - Einstein Coefficients – Ruby Laser – He-Ne Laser – Recording and Reconstruction of Holography- Applications.

OPTICAL FIBERS

Principle of Optical fiber – construction – Acceptance angle – Numerical Aperture – Types of Optical fibers – Single and Multi mode, Step Index and Graded Index fibers — Advantages of Optical Fibers in Communication – Applications in Communication.

UNIT – II

QUANTUM THEORY OF SOLIDS

Matter waves – Physical significance of wave function – Schrodinger's Time independent wave equation.Schrodinger's Time dependent wave equation - Particle in a 1 Dimensional Potential well.

UNIT-III
ELECTROMAGNETIC FIELDS
Grad – Div – Curl – Gauss and Stoke's theorems – Fundamental Laws of Electromagnetism. Maxwell's Equations – Poynting vector – Propagation of Electromagnetic waves in a dielectric medium.

UNIT-IV
MAGNETIC MATERIALS
Origin of magnetic moment – Classification of magnetic materials (Dia, Para, Ferro) - Weiss theory of Ferromagnetic domains – Hysteresis – Soft and Hard magnetic materials - Applications.

DIELECTRIC MATERIALS

Types of Polarization – Dielectrics in DC and AC fields – Internal field – Clausius Mossoti Equation – Dielectric Loss and Dielectric Breakdown – Ferroelectric Hysteresis and applications.

UNIT-V
PHYSICS OF SEMICONDUCTORS
Carrier Concentration in Intrinsic semiconductor – Fermi level and electrical conductivity in intrinsic semiconductors - Carrier Concentration in Extrinsic semiconductors – Variation of Fermi level with temperature and impurity concentration. Drift and Diffusion currents – Einstein's relation – Hall Effect & its applications.

Text Books:
1. Engineering Physics by R.K.Gaur and S.L.Gupta – Dhanpatrai Publications
2. Engineering Physics by M.Avadhanulu and P.G. Kshirasagar – S Chand Publications (10^{th} Edition)
3. Applied Physics by S.O.Pillai – New Age Publications – (3^{rd} Edition)

Reference Books:
1. Engineering Physics by P.K.Palanisamy – Scitech Publications (2014 Edition)
2. Engineering Physics by M.Armugam – Anuradha Publications
3. Engineering Physics by M.R.Srinivasan (2014 Edition) New Age International Publications

Problem Solving Approaches

I Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

Prerequisites: -

Course Outcomes

The student will learn

1. To formulate simple algorithms for arithmetic, logical problems and translate them to programs in c language.
2. To implement conditional branching, iteration and recursion.
3. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
4. To use arrays, pointers and structures to formulate algorithms and programs.
5. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
6. To use structures and files

SYLLABUS

UNIT – I:

Introduction to Computer Problem Solving: Programs and Algorithms, characteristics of an algorithm, Flowchart, Pseudo-code, The Problem – Solving Aspect, Top-Down design

Fundamental Algorithms Introduction, Summation of a set of numbers, Factorial computation, Generation of Fibonacci sequence, reversing the digits of an Integer.

UNIT – II:

Factoring Methods: Introduction, GCD of two Integers, Generating Prime numbers, Computing the Prime Factors of an Integer, Generation of pseudo-random numbers

Array Techniques: Introduction, Array Order Reversal, Finding the Maximum number in a set, Removal of duplicates from an ordered array, Partitioning an Array

UNIT-III:

Programming Languages and Introduction to C Programming: Properties of Machine Language, Assembly Language, High-Level Languages, Procedural and Object-Oriented Languages. Structure of C program, Indentation, Comments, Identifiers & variables, Data Types

Interactive Input, Formatted Output, Format Modifiers, Operators, Operator precedence & Associativity, Relational expressions, Type Casting, Mathematical Library Functions, Selection control statements: if and switch

UNIT -IV:

Repetition structures: Basic Loop Structures: while, for , do-while, Nested loops, **Modular Programming:** Functions and parameter declarations, Returning a Value, Functions with Empty Parameter Lists, Variable Scope

Modular Programming Variable Storage Class: Local, Global, **Pointers:** declaration and its usage, Functions with parameters: pass by value, pass by address, pointer to a function and function pointer

UNIT-V:

Arrays: One-Dimensional Arrays, Input and Output of Array Values, Array Initialization, Arrays as Function Arguments, Two-Dimensional Arrays, Larger Dimensional Arrays- Matrices

Strings: String Fundamentals, String Input and Output, String Processing, Library Functions related to strings.

TEXT BOOKS:

[1] R.G. Dromey, "How to Solve it By Computer", Prentice-Hall International Series in Computer Science, 1982.

[2] ReemaThareja, "Computer Fundamentals and C Programming", Oxford, 2012

REFERENCE BOOKS:

[1] DENNIS M. RITCHIE, BRIAN W KERNIGHAN, " The C Programming Language", Prentice-Hall International Series in Computer Science, Second Edition.

[2] Michael Schneider, Steven W. Weingart, David M. Perlman, "An Introduction to Programming and Problem Solving With Pascal", John Wiley and Sons Inc ,1984.

[3] David Gries, "The Science of Programming", Springer Verlag, 1981.

ENGINEERING GRAPHICS

I Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

Prerequisites: -

Course Outcomes:

1: Draw the polygons, ellipse, parabola, hyperbola, cycloids and involutes for various types of profiles.

2: Construction of various scales like plain, diagonal and venier scales .Draw the orthographic projections of the points, lines.

3: Draw the projections of planes.

4: Draw the projections of solids

5: Convert Orthographic projections to isometric projection and vice versa.

SYLLABUS:

UNIT I:

Lettering, Dimensioning, Geometrical Constructions. Polygons: General construction method, Inscribing and describing methods. Cycloids: Cycloid, Epicycloid, Hypocycloid and Involutes-Tangent and Normals to the above curves.

UNIT II :

Orthographic projections: Introduction, Projections of points.

Projections of straight lines- parallel to both the planes, parallel to one plane and inclined to the other plane.

Projections of straight lines inclined to both the planes, determination of true lengths, angle of inclinations and traces.

UNIT III

Projections of planes: Regular planes perpendicular/parallel to one plane and inclined to the other reference plane, Projections of planes inclined to both the reference planes.

UNIT IV: Projections of Solids – Prisms, Pyramids, Cones and Cylinders with the axis inclined to one of the reference planes.

Sections of solids: Prisms, Pyramids, Cones and Cylinders in simple positions.

UNIT V: Isometric Projections: Isometric views/projections of planes and simple solids, Conversion of orthographic views to isometric views. Conversion of isometric views to orthographic views. Introduction to AutoCAD

Text Books:

1. Engineering Drawing, N. D. Butt, Chariot Publications
2. Engineering Drawing +Auto CAD, K Venugopal &V Prabhuraja, Newage Publishers.

Reference Books:

1. Engineering Drawing, K. L. Narayana & P. Kannaiah, Scitech Publishers.
2. Engineering Graphics for Degree, K. C. John, PHI Publishers
3. Engineering Drawing, Agarwal & Agarwal, Tata McGraw Hill Publishers
4. Engineering Graphics, P.I. Varghese, McGraw Hill Publishers

ENGLISH COMMUNICATION SKILLS LAB-1

I Year – I Semester

Lecture: 0	Practical: 2	Internal Marks: 40
Credits: 1	Tutorial: 0	External Marks: 60

Prerequisites: -

Course Outcomes

The student will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

List of Experiments:

1 **Greetings and Introduction**
2 **Request Permission & Giving Directions**
3 **Inviting/Complaining/Congratulating**
4 **Root Words**
5 **Phonetics-Sounds and Symbols**
6 **Pronunciation Rules**

References:

1. ***Strengthen Your Steps*****,** Maruti Publications
2. ***Interact*****,** Orient Blackswan
3. Word Power Made Easy, Pocket Books

APPLIED PHYSICS LAB

I Year – I Semester

Lecture: 0	Practical: 3	Internal Marks: 40
Credits: 1.5	Tutorial: 0	External Marks: 60

Prerequisites: -

(Any 10 of the following listed experiments)

LIST OF EXPERIMENTS:

1. Determination of wavelength of a source-Diffraction Grating-Normal incidence.
2. Newton's rings – Radius of Curvature of Plano - Convex Lens.
3. Determination of thickness of a spacer using wedge film and parallel interference fringes.
4. Determination of wavelength of laser source using diffraction grating.
5. Determination of Numerical Aperture and bending loss of a given optical fiber.
6. Determination of Rigidity modulus of a material- Torsional Pendulum.
7. Determination of Acceleration due to Gravity and Radius of Gyration- Compound Pendulum.
8. Verification of laws of vibrations in stretched strings - Sonometer
9. Determination of Young's modulus by method of single cantilever oscillations.
10. Melde's experiment – Transverse and Longitudinal modes.
11. Magnetic field along the axis of a current carrying coil – Stewart and Gee's apparatus.
12. L- C- R Series Resonance Circuit.
13. Study of I/V Characteristics of Semiconductor diode.
14. I/V characteristics of Zener diode.
15. Energy Band gap of a Semiconductor p - n junction.

Problem Solving Approaches Lab

I Year – I Semester

Lecture: 2	Practical: 3	Internal Marks: 40
Credits: 1.5	Tutorial: 0	External Marks: 60

Prerequisites: -

List of Experiments:

1. a. Write an algorithm, flowchart and pseudo code to perform all arithmetic operations
   b. Write an algorithm, flowchart and pseudo code to find average of three numbers
   c. Write an algorithm, flowchart and pseudo code to find smallest of three numbers
2. a. Write an algorithm, flowchart and pseudo code for finding smallest divisor of an integer.
   b. Write an algorithm, flowchart and pseudo code to find x^y
3. Write a C program to convert temperature from Fahrenheit to Celsius and vice versa.
4. Write a C program to find the roots of quadratic equation
5. Write a C program to find whether a given number is prime
6. Write a C program find whether a given number is armstrong
7. Write a C program to display reverse of a given number
8. Write a C program to generate first n- terms of a fibonacci sequence.
9. Write a C program to calculate sin(x) value, where x is input given by user
10. Write a C program to calculate cos(x) value, where x is input given by user
11. Write a C program to perform operations on one dimensional array
    a. Smallest element of an array
    b. Largest element of an array
    c. swap smallest and largest element in an array
12. Write a C program to implement the following
    a. Addition of two matrices
    b. Multiplication of two matrices
13. Write a C program to perform the following operations on strings without using string handling functions
    a. To display length of the string
    b. To check whether a string is palindrome
    c. To delete n characters from a given position in a given string
14. Write recursive and non recursive programs for the following
    a. Factorial of a number
    b. GCD of two numbers
    c. Fibonacci series
15. Write a program which illustrates Storage classes

IT WORKSHOP

I Year – I Semester

Lecture: 2	Practical: 2	Internal Marks: 40
Credits: 1	Tutorial: 0	External Marks: 60

Prerequisites: -

LIST OF EXPERIMENTS:

1. **System Assembling, Disassembling and identification of Parts / Peripherals**
2. **Operating System Installation**-Install Operating Systems like Windows, Linux .
3. **MS-Office**
   a. **Word** - Formatting, Page Borders, Reviewing, Equations, symbols.
   b. **Spread Sheet** - organize data, usage of formula, graphs, charts.
   c. **Power point** - features of power point, guidelines for preparing an effective presentation.
   d. **Access**- creation of database, validate data.
4. **Network Configuration & Software Installation**-Configuring TCP/IP, proxy and firewall settings. Installing application software, system software & tools.
5. **Internet and World Wide Web**-Search Engines, Types of search engines, netiquette, cyber hygiene.
6. Trouble Shooting-Hardware trouble shooting, Software trouble shooting.
7. **MATLAB-** basic commands, subroutines, graph plotting.
8. **LATEX**-basic formatting, handling equations and images.

Text Books:

1. Computer Hardware, Installation, Interfacing, Troubleshooting and Maintenance, K.L. James, Eastern Economy Edition.
2. Microsoft Office 2007: Introductory Concepts and Techniques, Windows XP Edition by Gary B. Shelly, Misty E. Vermaat and Thomas J.
3. LATEX- User's Guide and Reference manual, Leslie Lamport, Pearson, LPE, 2/e.
4. Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers, Rudraprathap, Oxford University Press, 2002.
5. Scott Mueller's Upgrading and Repairing PCs, 18/e, Scott. Mueller, QUE, Pearson, 2008
6. The Complete Computer upgrade and repair book, 3/e, Cheryl A Schmidt, Dreamtech.
7. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech.
8. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.

I YEAR

SEMESTER-II

SYLLABUS

ENGLISH II

I Year – II Semester

Lecture: 1	Practical: 2	Internal Marks: 30
Credits: 2	Tutorial: 0	External Marks: 70

Prerequisites: -

SYLLABUS:

Unit 1 Transport: Problems and Solutions

The Scarecrow

Unit 2 The Drunkard

A Village Lost to the Nation

Unit 3 Evaluating Technology

The Knowledge Society

Unit 4 Industry: Safety and Training

Martin Luther King and Africa

Unit 5 Man's Peril (Detailed)

Report Writing

References:

1. English for Engineers and Technologists, Orient Blackswan
2. Prose for Communication, Ravindra Publishing House
3. Panorama, Oxford University Press

ENGLISH COMMUNICATION SKILLS LAB II

1	a.	Introducing Yourself and Other People
		Employability Skills
	b.	Introduction to Soft Skills
		My Skills, My Strengths
2	a.	Discussing Daily Routines
		Free Time Activities
	b.	Describing Family
		Talking about Family
3	a.	Giving Directions
		Ordering Food
	b.	Asking for and Paying the Bill
		Describing Appearances and Personality
4	a.	Writing a Product Description-1
	b.	Writing a Product Description-2
5	a.	Describing an Advertised Job
		Skills Needed for Different Jobs
	b.	What Kind of Job Are You Interested in?
		Finding out about a Job
6.	a.	Managing Nerves in a Presentation
	b.	Learning about Presentations

Reference:

Online Resources:

https://goo.gl/v57WHe

http://www.careerbuilder.co.in

https://goo.gl/w3FweC

https://goo.gl/4GoueJ **etc.**

VECTOR CALCULUS & FOURIER TRANSFORMS

I Year – II Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

Prerequisites: -

SYLLABUS:

UNIT I: Special functions & Multiple integrals:

Special functions: Beta function, Properties & problems, Gamma function, properties & problems, Relation between Beta and Gamma functions, Evaluation of improper integrals.

Multiple Integrals: Double integrals in Cartesian & polar coordinates, Change of order of integration, Triple integrals, Change of variables (Cartesian to Polar, Cartesian to Cylindrical & Cartesian to Spherical polar coordinate systems). **Applications:** Area enclosed by plane curves, Volume of solids.

UNIT II: Vector Calculus:

Vector Differentiation: Introduction, Scalar and Vector point functions, Del applied to scalar point functions-Gradient, Del applied to vector point functions-Div& Curl, Del applied twice to point functions, Del applied to products of point functions (Identities without proofs).

Vector Integration: Line integral, Green's theorem in the plane (without proof), Surface integrals, Stokes theorem (without proof), Volume integral, Gauss Divergence theorem (without proof).

UNIT III: Fourier Series:

Euler's formulae(without proof), Conditions of a Fourier expansion, Functions having points of discontinuity. Change of interval, Even and odd functions, Half-range series.

UNIT IV: Fourier Transforms:

Fourier Integral, Fourier cosine & sine integral, complex forms of Fourier integral.

Fourier transform, Fourier sine & cosine transforms, properties of Fourier transforms(without proof), Convolution theorem(without proof), finite Fourier sine & cosine transforms.

UNIT V: Applications of Partial Differential Equations:

Definition of PDE, Classification of 2nd order PDE, Variable separable method, Vibrations of a stretched string – Wave equation. One-dimensional heat flow, Two-dimensional heat flow, Solution of Laplace's equation.

Text Books:

1. **B. S. GREWAL,** Higher Engineering Mathematics, Khanna Publishers**,** 43rdEdition, 2014.
2. **B. V. RAMANA,** Higher Engineering Mathematics, Tata MC Graw Hill, 1st Edition, 2007.

Reference Books:

1. **N. P. BALI & Dr. MANISH GOYAL,** A Text book of Engineering Mathematics, Lakshmi Publications, 9th Edition, 2014.
2. **ERWIN KREYSZIG,** Advanced Engineering Mathematics, John Wiley & Sons, 10th Edition, 2015.

APPLIED CHEMISTRY

I Year – II Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

Prerequisites: -

COURSE OUTCOMES:

1:Study of polymers and composite materials enable us to use them in a good number of engineering fields

2: Industries are run by the quality of fuels and energy crisis can be met by broad understanding of different fuels

3: Electrochemical principles form the basis of batteries that are being developed. Destruction of metals and alloys can be prevented by understanding the science of corrosion.

4:Study of the existing developed materials forms a basis for developing more number of advanced materials

5: Methods of purification of water can be known so that more of them can be developed

6:The importance of engineering materials in the domestic and engineering fields can be understood.

SYLLABUS:

UNIT I: POLYMERS AND PLASTICS

Introduction- Degree of polymerization-functionality-tacticity-Types- Addition polymerization-Definition-PVC-Properties-applications condensation polymerization-Bakelite-Properties-applications,Physical and mechanical properties – Conducting polymers– Biodegradable polymers-applications– Natural rubber- Disadvantages - Compounding of rubber - vulcanization – Synthetic rubber: Thiokol -Thermoplastics and Thermosetting plastics –- Composite materials & Fiber reinforced plastics

UNIT II: BASICS OF ELECTRO CHEMISTRY AND CORROSION

Galvanic cell - Electro chemical series - Standard electrodes (Hydrogen and Calomel electrodes)

Primary cells: Zinc – air cell Secondary cells:- Lithium ion batteries, Pb-acid cell,

Fuel cells:- H_2-O_2 fuel cell and molten carbonate fuel cells

Corrosion: Dry Corrosion– Wet (Electrochemical) Corrosion –Factors influencing the rate of corrosion – Protection from corrosion – Cathodic protection – Electro plating -Electroless plating

UNIT III: NON CONVENTIONAL ENERGY SOURCES

Solar Energy: - Introduction, application of solar energy, conversion of solar energy

(Thermal conversion & photo conversion) – photovoltaic cell: design, working and its importance

Non-conventional energy sources:

(i) Hydropower include setup a hydropower plant (schematic diagram)

(ii) Geothermal energy: Introduction-schematic diagram of a geothermal power plant

(iii) Tidal and wave power: Introduction- Design and working-movement of tides and their effect on sea level.

(iv) Ocean thermal energy: Introduction, closed-cycle, ocean thermal energy conversion (OTEC), open cycle OTEC, hybrid OTEC, schematic diagram and explanation.

(v) Biomass and biofuels

UNIT IV: SEMICONDUCTORS AND SUPER CONDUCTORS

Non –Elemental Semi conductors: Stoichiometric, Non- Stoichiometric ,Controlled valency & Chalcogen photo/semiconductors- Preparation of Semiconductors Ge & Si by crystal pulling technique – purification by Zone refining.

Semiconductor Devices:- Diode –Transistor.

Super conductors:-Definition-Types- Characteristics –applications

UNIT V: ADVANCED MATERIALS AND GREEN CHEMISTRY

Nano materials:-Introduction –General methods of preparation (top down and bottom up)

Liquid Crystals-Definition, classification,applications

Green synthesis:- Introduction- Principles - methods of synthesis– alternative reactive media (aqueous phase method) and alternative energy sources(microwave method) -R4M4 principles-Econoburette.

SPECTROSCOPIC TECHNIQUES AND APPLICATIONS

UV Spectroscopy- Basic principle-Instrumentation- Applications IR Spectroscopy- Basic principle-Instrumentation- Applications NMR Spectroscopy- Basic principle-Instrumentation- Applications Analytical techniques: FE-SEM,TEM,BET Chromatography techniques: Paper chromatography, Thin layer chromatography- applications

Text Books:

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publicating Co.
2. Engineering Chemistry by Shikha Agarwal; Cambridge University Press, 2015 edition.

Reference Books:

1. Engineering Chemistry of Wiley India Pvt. Ltd., Vairam and others, 2014 edition (second).
2. Engineering Chemistry by Prasanth Rath, Cengage Learning, 2015 edition.
3. A text book of engineering Chemistry by S. S. Dara; S. Chand & Co Ltd., Latest Edition
4. Applied Chemistry by H.D. Gesser, Springer Publishers
5. Text book of Nano-science and nanotechnology by B.S. Murthy, P. Shankar and others, University Press, IIM

Biology for Engineers

I Year – II Semester

Lecture: 2	Practical: 0	Internal Marks: 30
Credits: 2	Tutorial: 0	External Marks: 70

Prerequisites: -

COURSE OUTCOMES:

After studying the course, the student will be able to:

1: Understand how biological observations lead to major discoveries and the morphological, Biochemical and ecological classification of organisms.

2: Understand that all forms of life have the same building blocks and their involvement in the Maintenance and metabolic processes of living organisms.

3: Classify enzymes and distinguish between different mechanisms of enzyme action and Study the chemical reactions that are catalyzed by enzymes. Apply thermodynamic, Principles to biological systems and able to understand major chemical processes that occur, Within a living organism in order to maintain life.

4: Identify DNA as a genetic material in the molecular basis of information transfer.

5: Identify and classify microorganisms, understand media compositions and growth of Microorganisms

SYLLABUS:

Unit-1: Introduction

Importance and need of biology- Discoveries of biology in 18th Century: Brownian motion and the origin of thermodynamics- their importance in any scientific inquiry.

Classification of organisms based on (a) Cellularity- Unicellular or Multicellular , (b) Ultra structure- prokaryotes or eucaryotes. (c) Energy and carbon utilization -autotrophs, heterotrophs, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureotelic (e) Habitat- acquatic or terrestrial (f) Molecular taxonomy- three major kingdoms of life.

Unit-2: Biomolecules

Introduction to molecules of life-monomeric units and polymeric structures of carbohydrates, Sugars, starch and cellulose, amino acids and proteins structure and function.

Nucleotides and DNA/RNA, Hierarchy of DNA Structure- from single stranded to double helix, two carbon units and lipids.

Unit-3: Enzymes & Metabolism

Enzyme classification, mechanism of enzyme action, enzyme kinetics and kinetic parameters.\

Thermodynamics as applied to biological systems, endergonic and exergoinc reactions, Concept of kinetic equilibrium and its relation to standard free energy Spontaneity, ATP as an energy currency, Glycolysis, Krebs cycle and Energy yielding and energy consuming reactions.

Unit-4: Information Transfer

Concept of genetic code, Molecular basis of information transfer; Transcription and translation.

Unit-5: Microbiology

Concept of species and strains, Identification of Micro organisms.

Sterilization and media compositions, Growth kinetics.

Text/Reference Books:

1) Biology: A global approach: Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd

2) Outlines of Biochemistry, Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H., John Wiley and Sons

3) Principles of Biochemistry (V Edition), By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company

4) Molecular Genetics (Second edition), Stent, G. S.; and Calender, R.W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher

5) Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown Publishers

Basic Electrical & Electronics Engineering

I Year – II Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

Prerequisites: -

SYLLABUS:

Unit – I: Electric Circuits

Basic definitions, Types of network elements & sources, Ohms law, Kirchhoff's laws, Series & parallel circuits.Source transformation, Network reduction reductions, Introduction to AC circuits.

Unit – II: Electrical Machines

Basic laws – Faraday's laws of electromagnetic induction, Lenz's law, Right hand thumb rule, Fleming's left hand and right hand rules, Construction, working principle and applications of DC machinesConstruction, working principle and applications of transformers, induction motor and synchronous machines.

Unit – III: Electrical Power Generation, Transmission and Distribution

Sources of Energy – conventional & non conventional, Introduction and layout of thermal, hydel power plants, Introduction and layout of nuclear power plants, solar power plants, Concepts of power transmission and distribution using single line diagram.

Unit – IV: Electrical Installations & Safety

Components of Switchgear – fuse, MCBs, types of wires & cables, earthing, different types of batteries, Elementary calculations for energy consumption and types of tariffs. Energy Conservation. Electric shock and first aid, Hazardous areas, General principles of electric safety.

Unit – V: Basic Electronic Devices and their applications

Introduction to semi-conductor physics, PN junction diode, Zener diode, Transistor - operation, characteristics and configurations, Operation of transistor as a switch. Half wave, full wave and bridge rectifier using diodes, types of filters, Zener diode as a voltage regulator, transistor as an amplifier. introduction to feed back amplifiers.

Text Books:

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
3. Electronic Devices and Circuits – Salivahanan, Kumar, Vallavaraj, TATA McGraw Hill, Second Edition

Data Structures through C

I Year – II Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 4	Tutorial: 1	External Marks: 70

Prerequisites: Problem Solving Approaches

SYLLABUS:

UNIT - I:

Sortings: Bubble sort, Insertion sort, section sort

Searching: linear search, binary search

UNIT II:

Pointers: Introduction, Pointer Arithmetic and Arrays, Memory Allocations Functions ,Compatibility, Lvalue and Rvalue, Arrays and Pointers, Passing an Array to a Function, , Array of Pointers. Pointers For Inter Function Communications, Pointers to Pointers

UNIT III:

Structures: Structure Type Declaration, Initialization, Accessing Structures, Operations on Structures, Complex Structures, Structures and Functions, Sending the Whole Structure, Passing Structures through Pointers.

Unions: Referencing Unions, Initializers, Unions and Structures, Applications.

Text Input/output: Files, Streams, Standard Library Input/Output Functions, Formatting Input/output Functions and Character Input/Output Functions, Command-Line Arguments.

UNIT IV:

Stacks: Definition, Representing stacks, ADT Stack and its operations: Applications of Stacks: Expression Conversion and evaluation – corresponding algorithms. Recursion, Towers of Hanoi problem.

Queues: Queue and its Sequential Representation, Queue as an abstract data type, Types of Queue: Simple Queue, Circular Queue, Operations on each types of Queues: Algorithms.

UNIT V:

Linked lists: Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; **Doubly linked list:** operations and algorithms.

Circular Linked Lists: all operations their algorithms, Linked representation of Stack and Queue. Polynomials: Addition, Multiplication.

TEXT BOOKS:

[1] ReemaThareja, "Computer Fundamentals and C Programming", Oxford, 2012

[2] Mark Allen Weiss,"Data structure and Algorithm Analysis in C". Addison Wesley Publication. 2006.

[3] SEYMOUR LIPSCHUTZ, "Data Structures With C – by Schaum Series" .

REFERENCE BOOKS:

[1] Horowitz Sahni and Anderson-Freed "Fundamentals of Data Structures in C". 2nd Edition, Universities Press, 2008.

[2] Richard F. Gilberg & B. A. Forouzan "Data Structures A Pseudocode Approcah with C", Second Edition, CENGAGE Learning.

Applied chemistry laboratory

I Year – II Semester

Lecture: 0 Practical: 3 Internal Marks: 40

Credits: 1.5 Tutorial: 0 External Marks: 60

Prerequisites: -

List of Experiments:

S.No	Name of the Experiment
1	Introduction to chemistry laboratory
2	Determination of HCl using standard Na_2CO_3 solutions
3	Determination of alkalinity of a sample containing Na2CO3 and NaOH.
4	Determination of temporary and permanent hardness of water using standard EDTA solution.
5	Determination of Copper using standard EDTA solution
6	Determination of ferrous iron using standard $K_2Cr_2O_7$ solution
7	Determination of $KMnO_4$ using standard Oxalic acid solution
8	Determination of pH of the given sample solution using pH meter
9	Conductometric Titrations between strong acid and strong base
10	Potentiometric Titrations between strong acid and strong base
11	Synthesis of Phenol-Formaldehyde resin
12	Synthesis of Urea-Formaldehyde resin
13	Determination of Surface tension of a liquid
14	Determination of Viscosity of a liquid
15	Determination of Flash and Fire point of a lubricant
16	Determination of Cloud and Pour point of a lubricant
17	Determination of Aniline point of a lubricant

Data Structures through C Lab

I Year – II Semester

Lecture: 0 Practical: 3 Internal Marks: 40

Credits: 1.5 Tutorial: 0 External Marks: 60

Prerequisites: C Programming

List of Experiments

1. Write C programs to sort the list of elements using following techniques
   a. Bubble Sort b. Insertion Sort c. Selection Sort
2. Write C programs to search for an element in an array using following techniques
   a. Linear Search b. Binary Search
3. Write a C program to demonstrate call by value and call by reference
4. Write a C program to display student information using structures
5. Write a C program to count number of lines, words and characters in a file
6. Write a C program to perform stack operations using arrays
7. Write a C program to perform queue operations using arrays
8. Write C program to implement stack applications.
   a. Conversion of Infix expression to postfix expression
   b. Evaluation of postfix expression c. Towers of Hanoi
9. Write a C program to perform circular queue operations using arrays
10. Write a C program to implement following operations on Single Linked List
    a. Insertion b. Deletion c. Search
11. Write a C program to implement following operations on Double Linked List
    a. Insertion b. Deletion c.Search
12. Write a C program to implement stack operations using linked list
13. Write a C program to implement queue operations using linked list
14. Write a C program to add two polynomials using linked list
15. Write a C program to multiply two polynomials using linked list

ENVIRONMENTAL STUDIES

I Year – II Semester

Lecture: 2 Practical: 0 Internal Marks: 30

Credits: 0 Tutorial: 0 External Marks: 70

Prerequisites: -

COURSE OUTCOMES:

1. The importance of environment, Natural resources and current global environmental challenges for the sustenance of the life on planet earth.
2. The concepts of the ecosystem and its function in the environment.
3. The biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity
4. The various attributes of the pollution and their impacts and measures to reduce or control the pollution along with waste management practices.
5. The environmental legislations of India and Social issues and the possible means
6. Environmental assessment and the stages involved in EIA.

SYLLABUS:

UNIT-I: MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Introduction- Scope of Environmental Studies- Importance of Environmental Studies- Need for public awareness,Environmental ethics- Contemporary Environmentalists- Environmental Global moves: Stockholm conference,Earth summit

Concept of an ecosystem - Structure of an ecosystem- function of an ecosystem- Food chains, food webs- ecological pyramids- Energy flow in the ecosystem- Ecological succession- Nutrient cycling- 1^{o}production& 2^{o}production- Major ecosystems: Forest ecosystem- Grassland ecosystem ,Desert ecosystem- Aquatic ecosystem: pond ,lake ecosystem- Streams ,river ecosystem, Oceans

UNIT-II : NATURAL RESOURCES AND CONSERVATION

Introduction and classification of natural resources- Forest resources**:** Use and over-exploitation - Deforestation-Timber extraction-Mining- Conservation- Water resources**:** Use and over utilization of surface and ground water,- Floods, drought, Dams and associated problems- Water conservation, rain water harvesting, water shed management- Energy resources**:** renewable energy sources – solar-wind-hydro-tidal- Ocean thermal-geo thermal-bio mass-bio gas-bio fuels- Hydrogen.- Non-renewable energy sources-coal-petroleum-natural gas-Nuclear energy

UNIT-III: **BIODIVERSITY AND ITS CONSERVATION**

Definition, classification- Value of biodiversity- Threats to biodiversity: habitat loss, man-wildlife conflicts- Endangered and endemic species of India- Conservation of biodiversity- Biodiversity at national and local levels, Hot-sports of biodiversity

UNIT-IV: ENVIRONMENTAL PROBLEMS

Global warming,Climate change- Acid rain , Ozone depletion- Air pollution- Water pollution- Soil pollution- Noise pollution, Nuclear hazards- Solid Waste Management: Causes, Consequences and Control methods- Solid Waste Management- Population growth and explosion, effects,control measures- Pollution case studies- Role of an individual in prevention of pollution

UNIT-V: ENVIRONMENTAL LEGISLATION &MANAGEMENT

Sustainable development- Air (Prevention and Control of Pollution) Act-Drawbacks- Water (Prevention and control of Pollution) Act- Drawbacks- Wildlife Protection Act- Drawbacks- Forest Conservation Act- Drawbacks- Environmental Protection Act- Drawbacks- Environmental Impact Assessment and its significance- Preparation of Envirronmental Management Plan and Environmental Impact Statement- Ecotourism

TEXT BOOKS:

1. Environmental Studies, Anubha Kaushik, C P Kaushik, New Age Publications, New Delhi
2. Environmental Studies, K. V. S. G. Murali Krishna, VGS Publishers, Vijayawada
3. Environmental Studies, R. Rajagopalan, 2nd Edition, 2011, Oxford University Press.
4.Environmental Studies, P. N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education, Chennai

REFERENCE:

1. Text Book of Environmental Studies, Deeshita Dave & P. UdayaBhaskar, Cengage Learning.
2. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi
3. Environmental Studies, Benny Joseph, Tata McGraw Hill Co, New Delhi
4. Perspectives in Environment Studies, Anubha Kaushik, C P Kaushik, New Delhi

II YEAR SEMESTER-I SYLLABUS

PROBABILITY AND STATISTICS

II Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

Prerequisites: -

SYLLABUS:

UNIT I: Discrete Random variables and Distributions:

Introduction-Random variables- Discrete Random variable-Distribution function- Expectation-Moment Generating function-Moments and properties. Discrete distributions: Binomial and Poisson distributions.

UNIT II: Continuous Random variable and distributions:

Introduction-Continuous Random variable-Distribution function- Expectation-Moment Generating function-Moments and properties. Continuous distribution: Normal distributions, Normalapproximation to Binomial distribution.

UNIT III: Sampling Theory:

Introduction - Population and samples- Sampling distribution of means (s known)-Central limit theorem- t-distribution- Sampling distribution of means (s unknown)- Sampling distribution of variances -χ^2 and F-distributions- Point estimation- Maximum error of estimate - Interval estimation.

UNIT IV: Tests of Hypothesis:

Introduction –Hypothesis-Null and Alternative Hypothesis- Type I and Type II errors –Level of significance - One tail and two-tail tests- Tests concerning one mean and proportion, two means-Proportions and their differences- ANOVA for one-way and two-way classified data.

UNIT V: Curve fitting and Correlation:

Introduction - Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares-Goodness of fit.Correlation and Regression – Properties.

Text Books:

1. **Richards A Johnson, Irvin Miller and Johnson E Freund**. Probability and Statistics for Engineering, 9th Edition, PHI.

2. **Jay l.devore,** Probability and Statistics for Engineering and the Sciences, 8th edition, Cengage.

Reference Books:

1. **ShronL.Myers, Keying Ye, Ronald E Walpole,** Probability and StatisticsEngineers and the Scientists,8th Edition, Pearson 2007.

2. **William Menden Hall, Robert J. Bever and Barbara Bever**, Introduction toprobability and statistics, Cengage learning, 2009.

OBJECT ORIENTED PROGRAMMING

II Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

PREREQUISITES: -

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Understand the principles of object oriented concepts. Define classes and objects by identifying real world entities, their properties and functionalities.
2. Reuse the existing classes by using inheritance and understand the concepts of packages and exception handling.
3. Make use of built-in classes in Java and understand the concept of thread.
4. Develop user interfaces using applets, AWT and Event handling in java.
5. Create portable GUI applictions using Swing components.

SYLLABUS:

UNIT-I:

Introduction to OOP, procedural programming language vs object oriented language, principles of OOP, applications of OOP, history of java, java features, JVM. Variables, primitive data types, identifiers, literals, operators, expressions, precedence rules and associativity, primitive type conversion and casting, flow of control.

Classes and objects, class declaration, creating objects, methods, constructors and constructor overloading, garbage collector.

UNIT-II:

Inheritance, types of inheritance, super keyword, final keyword, overriding and abstract class. Interfaces, creating the packages, using packages, importance of CLASSPATH and java.lang package, importance of static keyword and examples, this keyword, arrays, command line arguments, nested classes.

Exception handling, importance of try, catch, throw, throws and finally block, userdefined exceptions, Assertions.

UNIT-III:

Multithreading: Introduction, thread life cycle, creation of threads, thread priorities, thread synchronization, communication between threads. Reading data from files and writing data to files, random access file.

UNIT-IV:

Applet class, Applet structure, Applet life cycle, sample Applet programs. Event handling: event delegation model, sources of event, Event Listeners, adapter classes, inner classes.

UNIT-V:

AWT: introduction, components and containers, Button, Label, Checkbox, Radio Buttons, List, Boxes, Choice Boxes, Container class, Layouts, Menu and Scrollbar.

Swing: Introduction, JFrame, JApplet, JPanel, Componets in Swings, Layout Managers in Swings, JList and JScrollPane, Split Pane, JTabbedPane, JTree, JTable, Dialog Box.

TEXT BOOKS:

1. The complete Reference Java, 8th edition, Herbert Schildt, TMH.
2. Programming in JAVA, Sachin Malhotra, SaurabhChoudary, Oxford.
3. JAVA for Beginners,4e,Joyce Farrell,Ankit R. Bhavsar,Cengage Learning.
4. Object oriented programming with JAVA,Essentials and Applications, Raj Kumar Bhuyya,Selvi,Chu,TMH.
5. Introduction to java programming, 7th edition by Y Daniel Liang, Pearson.

REFERENCE BOOKS:

1.Java Programming,K.Rajkumar.Pearson
2.Core Java,Black Book,R Nageswara rao,Wiley,Dream Tech
3.Core Java for Beginners,Rashmi Kanta Das,vikas.
4.Object Oriented Programming Through java, P.Radha Krishna, Universities Press

ADVANCED DATA STRUCTURES

II Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

PREREQUISITES: Data Structures

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Create hash based index for efficient search
2. Analyze the efficiency of various tree data structures
3. Understand the concept of priority queues and its applications
4. Implement tree data structures for multi-way search
5. Identify and implement shortest path in various real time problems.

SYLLABUS:

UNIT-I:

SORTING: Quick Sort, Merge Sort, External Sorting, Introduction, K-way Merging - Buffer Handling for parallel Operation.

HASHING : Introduction-Static Hashing- Hash Table- Hash Functions- Secure Hash Function- Overflow Handling- Theoretical Evaluation of Overflow Techniques

UNIT-II: TREES

Introduction, Terminology, Representation of Trees, Binary Trees, Properties of Binary Tress, Binary Tree Representations, Tree Traversal: Inorder Traversal, Preorder Traversal, Postorder Traversal, Binary Search Trees, Definition, Searching a Binary Search Tree, Insertion into a Binary Search Tree, Deletion from a Binary Search Tree, Height of Binary Search Tree, AVL Trees, Insertions and Deletions.

UNIT-III: PRIORITY QUEUES (HEAPS)

Model, Simple Implementation, Binary Heap-Structure Property-Heap-Order Property-Basic Heap Operations- Other Heap Operation, Applications of Priority Queues- The Selection Problem Event Simulation Problem, Binomial Queues- Binomial Queue Structure – Binomial Queue Operation-Implementation of Binomial Queues

UNIT-IV: MULTIWAY SEARCH TREES

M-Way Search Trees, Definition and Properties- Searching an M-Way Search Tree, B-Trees, Definition and Properties- Number of Elements in a B-tree- Insertion into B-Tree- Deletion from a B-Tree- B+-Tree Definition- Searching a B+-Tree- Insertion into B+-tree- Deletion from a B+-Tree.

UNIT-V: GRAPHS

Introduction, Definition, Graph Representation, Elementary Graph Operation, Depth First Search, Breadth First Search, Connected Components, Spanning Trees, Minimum Cost Spanning Trees, Kruskal'S Algorithm, Prim's Algorithm,Sollin's Algorithm, Dijkstra's Algorithm

TEXT BOOKS:

1. Data Structures, a Pseudocode Approach, Richard F Gilberg, Behrouz A Forouzan,Cengage.
2. Fundamentals of DATA STRUCTURES in C: 2nd ed, , Horowitz , Sahani, Andersonfreed, Universities Press
3. Data structures and Algorithm Analysis in C, 2nd edition, Mark Allen Weiss, Pearson

REFERENCE BOOKS:

1. Web : http://lcm.csa.iisc.ernet.in/dsa/dsa.html
2. http://utubersity.com/?page_id=878
3. http://freevideolectures.com/Course/2519/C-Programming-and-Data-Structures
4. http://freevideolectures.com/Course/2279/Data-Structures-And-Algorithms
5. File Structures :An Object oriented approach with C++, 3ed, Michel J Folk, Greg Riccardi, Bill Zoellick

DIGITAL LOGIC DESIGN

II Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

PREREQUISITES: -

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Apply Boolean laws & theorems to digital Logic functions; simplify the Boolean functions to the minimum number of literals
2. Design different types of combinational logic circuits using Adders, Subtractors, Decoders, Multiplexers and Magnitude Comparators.
3. Design clocked sequential logic circuits using flip flops
4. Design different types of Counters, Registers.
5. Contrast Programmable logic devices(PROM, PAL, and PLA) and its design.

SYLLABUS:

UNIT I:

Number Systems and Codes: Decimal, Binary, Octal, Hexadecimal Number systems and their conversions, Complements: r's complement, (r-1)'s complement, Arithmetic additions, subtraction using the method of complements. Codes: BCD, Excess 3, Gray codes.

Boolean algebra And Logic Gates:

Digital computers and digital systems, Basic theorems and Properties of Boolean Algebra, Boolean functions, Canonical and Standard Forms, Digital Logic Gates, Universal gates, Canonical and standard forms, simplification of Boolean

Functions using K maps (up to five variables), Don't-Care conditions, Tabulation method, Two level NAND and NOR implementations.

UNIT II:

Combinational Logic:

Introduction, Design Procedure, Adders, Subtractors, Code Conversion, Analysis Procedure. Exclusive-or Gates, Parity Generators and Checkers.

Combinational Logic with MSI and LSI: Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoders, Demultiplexers, Encoders, Multiplexers, Code Conversion.

UNIT III :

Sequential Logic: Sequential circuits, Classification, Latches, Flip Flops, Triggering of Flip-Flops, Master slave flip-flop, Flip-Flop Excitation tables, flip-flop direct inputs.

Analysis of Clocked Sequential Circuits: State table, State diagram, state equations, State Reduction and Assignment, Design Procedure, design with unused states, Design of Counters.

UNIT IV:

Registers: Register, Left Shift register, Right shift register, Bidirectional Shift register, Universal Shift register.

Counters: Design of Synchronous counters, Ripple counters, Up/Down counters, Ring counter, Johnson counter.

UNIT V:

Programmable Logic & Clock Circuits: Read – Only Memory (ROM), PROM, Programmable Logic Device (PLD), Programmable Logic Array (PLA), Programmable Array Logic (PAL), 555 timer, Astable and Monostable operations.

TEXT BOOKS

1.M.Morris Mano, Digital Logic & Computer Design 1 e/d reprint, Pearson education, 2013.
2. Roth ,Fundamentals of Logic Design, Cengage,5/e.

REFERENCE BOOKS:

1. Donald e Givone, Digital Principles and Design, TMH.
2. A.Anand Kumar ,Fundamentals of Digital Circuits,4th Edition,PHI
3. Zvi Kohavi, Switching and Finite Automata Theory, 2nd Edition, TMH, 1978.

Humanities-I: Effective Technical Communication

II Year – I Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

SYLLABUS:

UNIT-I: Vocabulary Building

The concept of word formation, Root words from foreign languages and their use in English, Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives, Synonyms, antonyms, and standard abbreviations

UNIT-II: Writing Skills

Sentence structures, Use of phrases and clauses in sentences Importance of proper punctuation Creating coherence, Organizing principles of paragraphs in documents, Comprehension, Essay writing

UNIT-III: Identifying Common Errors in Writing

Subject-verb agreement Noun-pronoun agreement Misplaced modifiers Articles, Prepositions, Redundancies, Cliches

UNIT-IV: Oral Communication

Common everyday situations: Conversations and Dialogues, Communication at workplace, Interviews, Formal presentations

UNIT V: Life Skills

Self-assessment and self-esteem, Attitudes, values and beliefs, Personal goal setting, Career planning, Managing time, Complex problem-solving, Creativity

Suggested Readings:

1. Practical English Usage. Michael Swan. OUP. 1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007.
3. On Writing Well. William Zinsser. Harper Resource Book. 2001.
4. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press.
5. Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press.
6. Exercises in Spoken English. Parts. CIEFL, Hyderabad. OxfordUniversity press
7. You Con Win. Shiv Khera. Macmillan Books, New York, 2003.

OBJECT ORIENTED PROGRAMMING LAB

II Year – I Semester

Lecture: 0	Practical: 4	Internal Marks: 40
Credits: 2	Tutorial: 0	External Marks: 60

PREREQUISITES: -

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Understand the behavior of primitive data types, object references, and arrays.
2. Implement Java classes from specifications
3. Implement interfaces, inheritance, and polymorphism as programming techniques
4. Apply exceptions handling.

LIST OF LAB EXPERIMENTS:

Exercise - 1 (Basics)

a). Write a JAVA program to display default value of all primitive data type of JAVA

b). Write a java program that display the roots of a quadratic equation ax2+bx=0. Calculate the discriminate D and basing on value of D, describe the nature of root.

Exercise - 2 (Operations, Expressions, Control-flow, Strings)

a). Write a JAVA program to search for an element in a given list of elements using binary search mechanism.

b). Write a JAVA program to sort for an element in a given list of elements using bubble sort

(c). Write a JAVA program to sort for an element in a given list of elements using merge sort.

(d) Write a JAVA program using StringBuffer to delete, remove character.

Exercise - 3 (Class, Objects)

a). Write a JAVA program to implement class mechanism. – Create a class, methods and invoke them inside main method.

b). Write a JAVA program to implement constructor.

Exercise - 4 (Methods)

a). Write a JAVA program to implement constructor overloading.

b). Write a JAVA program implement method overloading.

Exercise - 5 (Inheritance)

a). Write a JAVA program to implement Single Inheritance.

b). Write a JAVA program to implement multi level Inheritance.

c). Write a java program showing the usage of abstract class.

Exercise - 6 (Inheritance - Continued)

a). Write a JAVA program give example for "super" keyword.

b). Write a JAVA program to implement Interface.

Exercise - 7 (Exception)

a).Write a JAVA program that describes exception handling mechanism

b).Write a JAVA program Illustrating Multiple catch clauses.

Exercise – 8 (Runtime Polymorphism)

a). Write a JAVA program that implements Runtime polymorphism

Exercise – 9 (Exception)

a). Write a JAVA program Illustrating exception handling keywords.

b). Write a JAVA program for creation of Java Built-in Exceptions

c).Write a JAVA program for creation of User Defined Exception

Exercise – 10 (Threads)

a). Write a JAVA program that creates threads by extending Thread class.

b). Write a program illustrating **isAlive** and **join ()**

c). Write a Program illustrating Daemon Threads.

Exercise - 11 (Threads continuity)

a).Write a JAVA program Producer Consumer Problem

b) Write a case study on thread Synchronization after solving the above producer consumer problem

Exercise – 12 (Packages)

a). Write a JAVA program illustrate class path

b). Write a case study on including in class path in your os environment of your package.

c). Write a JAVA program that import and use your package in the previous Problem.

Exercise - 13 (Applet)

a).Write a JAVA program to paint like paint brush in applet.

b). Write a JAVA program to create different shapes and fill colors using Applet.

Exercise - 14 (Event Handling)

a).Write a JAVA program that display the x and y position of the cursor movement using Mouse.

b).Write a JAVA program that identifies key-up key-down event user entering text in a Applet.

ADVANCED DATA STRUCTURES LAB

II Year – I Semester

Lecture: 0	Practical: 4	Internal Marks: 40
Credits: 2	Tutorial: 0	External Marks: 60

PREREQUISITES: Data Structures, C/C++ programming

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Develop indices.
2. Implement various search trees.
3. Crate a graph and traverse the graph
4. Develop code for shortest path problems.

LIST OF LAB EXPERIMENTS:

1 To implementation of Quick Sort
2 To implementation of Merge Sort
3 To implementation of Static Hashing (Use Linear probing for collision resolution)
4 To implementation of Binary Search trees.
5 To perform various operations i.e., insertions and deletions on AVL trees.
6 To implement operations on binary heap.
7 To implement operations on graphs
   i) vertex insertion
   ii) Vertex deletion
   iii) finding vertex
   iv)Edge addition and deletion
8 To implementation of Breadth First Search Techniques.
9 To implementation of Depth First Search Techniques.
10 To implement Prim's algorithm to generate a min-cost spanning tree.
11 To implement Krushkal's algorithm to generate a min-cost spanning tree.
12 To implement Dijkstra's algorithm to find shortest path in the graph.

R PROGRAMMING LAB

II Year – I Semester

Lecture: 0	Practical: 4	Internal Marks: 40
Credits: 2	Tutorial: 0	External Marks: 60

PREREQUISITES: -

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Implement the basic concepts and data structures of R.
2. Implement loops and functions in R
3. Implement mathematical functions and handling files
4. Apply the different distributions
5. Use various graphical tools in R
6. Describe the properties of discrete and continuous distribution functions

Concepts to be covered:

Introduction, How to run R, R Programming Structures, Control Statements, Loops, , Functions, Recursion, Doing Math and Simulation in R, Input /output, Accessing the Keyboard and Monitor, Reading and writer Files, Creating Graphs, Saving Graphs to Files, Probability Distributions, Correlation and Covariance, Linear Models.

LIST OF EXPERIMENTS:

Exercise 1: Introduction to R Programming

Exercise 2: Getting Used to R: working with Data structures

Exercise 3: Using Conditional & Iterative Statements in R

Exercise 4: Working with functions

Exercise 5: Doing Math and Simulation in R

- Math Functions
- Calculus
- Linear algebraic operations
- Set operations

Exercise 6: Reading in Your Own Data

- Working with files
- Accessing the Keyboard and Monitor,

Exercise 7: Data visualization

- Charts and plots
- Find the mean, median, standard deviation and quintiles of a set of observations.
- Students may experiment with real as well as artificial data sets.

Exercise 8: Probability Distributions.

- Generate and Visualize Discrete and continuous distributions using the statistical environment. Demonstration of Normal, binomial and Poisson distributions.
- Students are expected to generate artificial data using and explore various distribution and its properties. Various parameter changes may be studied.

Exercise 9: Correlation

Calculate the correlation between two variables.
Use the scatter plot to investigate the relationship between two variables

Exercise 10: Fitting a straight line of type y=a+bx

- A Statistical Model for a Linear Relationship
- The R Function: lm

TEXT BOOKS:

1) Statistical Learning using R, WHITTON

2) The Art of R Programming, A K Verma, Cengage Learning.

3) R for Everyone, Lander, Pearson

4) The Art of R Programming, Norman Matloff, No starch Press.

REFERENCES:

1) R Cookbook, Paul Teetor, Oreilly.

2) R in Action, Rob Kabacoff, Manning

Constitution of India

II Year – I Semester

Lecture: 2	Practical: 0	Internal Marks: -
Credits: 0	Tutorial: 0	External Marks: -

PREREQUISITES: -

COURSE OUTCOMES:

At the end of the course, the student will be able to have a clear knowledge on the following:

1. Know the sources, features and principles of Indian Constitution.
2. Learn about Union Government, State government and its administration.
3. Get acquainted with Local administration and Pachayati Raj.
4. Be aware of basic concepts and developments of Human Rights.
5. Gain knowledge on roles and functioning of Election Commission

SYLLABUS:

UNIT-I

Introduction to Indian Constitution: Constitution' meaning of the term, Indian Constitution - Sources and constitutional history, Features - Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy.

UNIT-II

Union Government and its Administration Structure of the Indian Union: Federalism, Centre- State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha, The Supreme Court and High Court: Powers and Functions;

UNIT-III

State Government and its Administration Governor - Role and Position - CM and Council of ministers, State Secretariat: Organisation, Structure and Functions

UNIT-IV

A.Local Administration - District's Administration Head - Role and Importance, Municipalities - Mayor and role of Elected Representative - CEO of Municipal Corporation PachayatiRaj: Functions PRI: Zila Panchayat, Elected officials and their roles, CEO Zila Panchayat: Block level Organizational Hierarchy - (Different departments), Village level - Role of Elected and Appointed officials - Importance of grass root democracy

UNIT-V

Election Commission: Election Commission- Role of Chief Election Commissioner and Election Commissionerate State Election Commission:, Functions of Commissions for the welfare of SC/ST/OBC and women

REFERENCES:

1. Durga Das Basu, Introduction to the Constitution of India, Prentice – Hall of India Pvt. Ltd.. New Delhi
2. Subash Kashyap, Indian Constitution, National Book Trust
3. J.A. Siwach, Dynamics of Indian Government & Politics
4. D.C. Gupta, Indian Government and Politics
5. H.M.Sreevai, Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication)
6. J.C. Johari, Indian Government and Politics Hans
7. J. Raj Indian Government and Politics
8. M.V. Pylee, Indian Constitution Durga Das Basu, Human Rights in Constitutional Law, Prentice – Hall of India Pvt. Ltd.. New Delhi
9. Noorani, A.G., (South Asia Human Rights Documentation Centre), Challenges to Civil Right), Challenges to Civil Rights Guarantees in India, Oxford University Press 2012

E-RESOURCES:

1. nptel.ac.in/courses/109104074/8
2. nptel.ac.in/courses/109104045/
3. nptel.ac.in/courses/101104065/
4. www.hss.iitb.ac.in/en/lecture-details
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution

Technical Seminar

II Year – I Semester

Lecture: 1	Practical: 0	Internal Marks: -
Credits: 1	Tutorial: 0	External Marks: -

II YEAR SEMESTER-II SYLLABUS

Discrete Mathematics

II Year – II Semester

Lecture: 2	Practical: 0	Internal Marks: 30
Credits: 2	Tutorial: 0	External Marks: 70

SYLLABUS:

UNIT-I

Mathematical Logic: Introduction, Statements and Notation, Connectives, Normal forms, Theory of inference for Statement Calculus, The Predicate Calculus, Inference theory of Predicate calculus.

UNIT-II

Set Theory: Introduction, Basic concepts of set theory, Principle of Inclusion and Exclusion, Properties of Binary relations, Relation matrix and Digraph, operations on relations, Partition and covering, Transitive closure, Equivalence, Compatibility and Partial Ordering Relations, Hasse Diagrams, Bijective functions, Inverse functions, Composition of functions, Recursive functions, Pigeonhole principle and its applications.

UNIT-III

Algebraic Structures: Algebraic systems and examples, general properties, semigroup, monoid, groups and subgroups.

Number Theory: Properties of integers, Division algorithm, The greatest common divisor, Euclidean algorithm (without proof), Least common multiple, testing of prime numbers, The fundamental theorem of Arithmetic, Fermat's theorem and Euler's theorem (without proofs) and its applications.

UNIT-IV

Combinatorics and Recurrence Relations: Basic counting principles- sum rule, solving recurrence relations by substitution and by the method of characteristic roots.

UNIT -V:

Graph Theory: Basic Concepts of Graphs, Sub graphs, Matrix Representation of Graphs: Adjacency Matrices, Incidence Matrices, Isomorphic Graphs, Paths and Circuits, Eulerian and Hamiltonian Graphs, Multigraphs, Planar Graphs, Euler's Formula, Graph Colouring and Covering, Chromatic

Number, Spanning Trees, Algorithms for Spanning Trees (Problems Only and Theorems without Proofs).

TEXT BOOKS:

1. Discrete Mathematics for Computer Scientists and Mathematicians, J. L. Mott, A. Kandel, T.P. Baker, 2nd Edition, Prentice Hall of India.
2. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblayand P. Manohar, Tata McGraw Hill
3. Mathematical Foundation for Computer science, S. Santha, E.V. Prasad, Cengage publications.

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REFERENCE BOOKS:

1. Discrete Mathematics and its Applications with Combinatorics and Graph Theory, K. H.Rosen, 7th Edition, Tata McGraw Hill.
2. Discrete Mathematical Structures, BernandKolman, Robert C. Busby, Sharon Cutler Ross, PHI. 3. Discrete Mathematics, S. K. Chakraborthy and B.K. Sarkar, Oxford, 2011.

DATA BASE MANAGEMENT SYSTEMS

II Year – II Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

PREREQUISITES: -

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Describe a database and different database models
2. Design Entity Relationship models And Relational Model
3. Design and implement queries using Structured Query Language
4. Design database schema using normalization.
5. Understand the characteristics of database transaction management.

SYLLABUS:

Unit – I:

Introduction: Database system, Characteristics (Database Vs File System), Database Users (Actors on Scene, Workers behind the scene), Advantages of Data base systems, and Database applications.

Brief introduction of different Data Models- the ER Model – Relational Model – Other Models; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system structure.

Unit – II:

Entity Relationship Model: Introduction, Representation Of Entities, Attributes, Entity Set, Relationship, Relationship Set, Constraints, Sub Classes, Super Class, Inheritance, Specialization, And Generalization Using ER Diagrams.

Relational Model: Introduction to Relational Model, Concepts of Domain, Attribute, Tuple, Relation, Importance Of Null Values, Constraints (Domain, Key Constraints, Integrity Constraints) And Their Importance

Unit – III:

SQL: Simple Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update), basic SQL querying (select and project) using where clause, arithmetic & logical operations, SQL functions (Date and Time, Numeric, String conversion), Creating tables with

relationship, implementation of key and integrity constraints, nested queries, sub queries, grouping, aggregation, ordering.

Implementation of different types of joins, view(updatable and non-updatable), relational set operations, Definition of NOSQL, History of NOSQL and Different NOSQL products, Applications, features of NoSQL, Difference between SQL and NoSQL

Unit-IV

Schema Refinement (Normalization): Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency(1NF, 2NF and 3 NF), concept of surrogate key, Boyce-Codd normal form(BCNF), Lossless join and dependency preserving decomposition, Fourth normal form(4NF).

Indexing: Hashing, single and multi-level indexes, dynamic multilevel indexing using B-Tree and B+ tree, index on multiple keys.

Unit-V

Transaction Management And Concurrency Control: Transaction, properties of transactions, transaction log, and transaction management with SQL using commit rollback and savepoint, Concurrency control for lost updates, uncommitted data, inconsistent retrievals and the Scheduler. Concurrency control with locking methods: lock granularity, lock types, two-phase locking for ensuring serializability, deadlocks.

Recovery System: Introduction to ARIE, The Log, The Write-Ahead Log Protocol, check pointing, Recovery from system crash

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, *"Data base Management Systems"*, 3rd Edition, TATA McGrawHill, 2008.

2. Silberschatz, Korth, *"Data base System Concepts"*, 6th Edition, McGraw Hill, 2010.

3. C.J.Date, "*Introduction to Database Systems"*, 7th Edition, Pearson Education, 2002.

4. Professional NOSQL" by Shashank Tiwari, 2011, WROX Press.

REFERENCES:

1. Peter Rob & Carlos Coronel, *"Data base Systems design, Implementation, and Management"*, 7th Edition, Pearson Education, 2000.

2. Elmasri Navrate, *"Fundamentals of Database Systems"*, 5th Edition, Pearson Education, 2007.

COMPUTER ORGANIZATION & ARCHITECTURE

II Year – II Semester

Lecture: 2	Practical: 0	Internal Marks: 30
Credits: 2	Tutorial: 0	External Marks: 70

PREREQUISITES: -DLD

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Understand the architecture of a modern computer with its various processing units.

2. Understand RTL, micro operations, instruction cycle

3. Understand the features of hardwired and micro programmed control units.

4. Analyze the memory hierarchy system and performance improvement by cache memory.

5. Analyze the communication methods of I/O devices and standard I/O interfaces.

SYLLABUS:

UNIT I:

Basic Structure of Computers: Computer Types, Functional unit, Basic Operational concepts, Bus structures, Data Representation: Data types, Complements, Fixed Point Representation. Floating – Point Representation. Other Binary Codes, Error Detection codes. Performance, The history of computer development.

UNIT II:

Register Transfer Language And Micro Operations: Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, Computer Register, Computer instructions, Timing and control, Instruction cycle, Memory – Reference Instructions. Input – Output and Interrupt.

UNIT III :

Central Processing Unit: Stack Organization**,** Instruction formats, Addressing modes, Data Transfer and Manipulation Instructions, Program control Instructions.

Control Unit: Control Memory, Hard wired control, Micro programmed control and Micro Instruction Format, Address Sequencing, Design of Control Unit.

UNIT IV:

Memory Organization:

Memory Hierarchy, Primary Memory, Introduction to Secondary Memory, Associative Memory, Cache Memory, virtual Memory, Memory Management hardware.

UNIT V:

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

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupts, Direct memory Access, IOP, Serial Communication.

TEXT BOOKS

1. M.Morris Mano, ―Computer Systems Architecture, Pearson Education publishers, 3rd edition.
2. Carl Hamacher, ZvonkoVranesic, SafwatZaky, ―Computer Organization, TMH publications, 5th edition, 2002.

REFERENCE BOOKS:

1. William Stallings, ―Computer Organization and Architecture, Pearson/PHI publishers, 6th edition, 2004.
2. Andrew S. Tanenbaum, ―Structured Computer Organization, Pearson/PHI publishers, 4th edition, 2005.
3. John D Carpinelli, ―Computer Systems Organization and Architecture‖, Pearson Education, 1st edition, 2001

OPERATING SYSTEMS

II Year – II Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

PREREQUISITES: -

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Understand the functionalities of an operating system and Evaluate different CPU scheduling algorithms.
2. Apply synchronization to cooperating processes and handle the deadlocks
3. Learn various management techniques for efficient utilization of system memory.
4. Understand and analyze theory and implementation of files and Evaluate different disk scheduling algorithms.
5. Analyze the functionalities in various operating systems.

SYLLABUS:

UNIT I

Introduction to Operating System Concept: Types of operating systems, operating systems concepts, operating systems services, Introduction to System call, System call types.

Process Management – Process concept, the process, Process State Diagram, Process control block, Process Scheduling- Scheduling Queues, Schedulers, Operations on Processes, Inter process Communication, Scheduling-Basic Concepts, Scheduling Criteria, and Scheduling Algorithms.

UNIT-II:

Concurrency: Process Synchronization, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization examples

Principles of deadlock – System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery form Deadlock

UNIT-III:

Memory Management: Swapping, Contiguous Memory Allocation, Paging, structure of the Page Table, Segmentation

Virtual Memory Management:

Virtual Memory, Demand Paging, Page-Replacement Algorithms, Thrashing

UNIT-IV:

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

File System implementation- File system structure, allocation methods, free-space management

Mass-storage structure overview of Mass-storage structure, Disk scheduling, Device drivers,

UNIT V:

Linux System: Components of LINUX, Inter process Communication, Synchronization, Interrupt, Exception and System Call.

Android Software Platform: Android Architecture, Operating System Services, Android Runtime Application Development, Application Structure, Application Process management

TEXT BOOKS:

1. Operating System Concepts, Abraham Silberschatz, Peter Baer Galvin and Greg Gagne 9th Edition, John Wiley and Sons Inc., 2012.

2. Operating Systems – Internals and Design Principles, William Stallings, 7th Edition, Prentice Hall, 2011.

3. Operating Systems-S Halder, Alex A Aravind Pearson Education Second Edition 2016 .

REFERENCES:

1. Modern Operating Systems, Andrew S. Tanenbaum, Second Edition, Addison Wesley, 2001.

2. Operating Systems: A Design-Oriented Approach, Charles Crowley, Tata Mc Graw Hill Education", 1996.

3. Operating Systems: A Concept-Based Approach, D M Dhamdhere, Second Edition, Tata Mc Graw-Hill Education, 2007.

Managerial Economics & Financial Analysis

II Year – II Semester

Lecture: 3	Practical: 0	Internal Marks: 30
Credits: 3	Tutorial: 0	External Marks: 70

COURSE OUTCOMES:
At the end of this course the student will able to:

- The Learner is equipped with the knowledge of estimating the Demand for a product and the relationship between Price and Demand.
- One should understand the Cost Concepts for decision making and to estimate the least cost combination of inputs.
- One has to understand the nature of different markets and Price Output determination under various market conditions.
- One should equipped with the knowledge of different Business Units
- The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis.
- The Learner is able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.

SYLLABUS

UNIT – I:
Introduction to Managerial Economics and demand Analysis:
Definition of Managerial Economics and Scope-Managerial Economics and its relation with other subjects-Concepts of Demand-Types-Determents-Law of Demand its Exception-Elasticity of Demand-Types and Measurement- Demand forecasting and its Methods.

UNIT – II:
Production and Cost Analyses:
Production function-Isoquants and Isocosts-Law of Variable proportions- Cobb-Douglas Production function-Economics of Sale-Cost Concepts- Opportunity Cost-Fixed vs Variable Costs-Explicit Costs vs Implicit Costs-Out of Pocket Costs vs Imputed Costs-Cost Volume Profit analysis- Determination of Break-Even Point (Simple Problem).

UNIT – III:
Introduction to Markets, Theories of the Firm & Pricing Policies:
Market Structures: Perfect Competition, Monopoly and Monopolistic and Oligopoly – Features – Price, Output Determination – Managerial Theories of firm: Maris and Williamson's models – Methods of Pricing: Limit Pricing, Market Skimming Pricing, Internet Pricing: Flat Rate Pricing, Usage sensitive, Transaction based pricing, Priority Pricing.

UNIT – IV:

Types of Business Organization and Business Cycles:

Features and Evaluation of Sole Trader – Partnership – Joint Stock Company – State/Public Enterprises and their forms – Business Cycles – Meaning and Features – Phases of Business Cycle.

UNIT – V:

Introduction to Accounting & Financing Analysis:

Introduction to Double Entry Systems – Preparation of Financial Statements- Analysis and Interpretation of Financial Statements

Capital Budgeting: Meaning of Capital Budgeting-Need for Capital Budgeting- Techniques of Capital Budgeting-Traditional and Modern Methods.

TEXT BOOKS :

1. Dr. N. Appa Rao, Dr. P. Vijay Kumar: 'Managerial Economics and Financial Analysis', Cengage Publications, New Delhi – 2011.
2. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011.
3. Prof. J.V.Prabhakara rao, Prof. P. Venkatarao. 'Managerial Economics and Financial Analysis', Ravindra Publication.

REFERENCES :

1. V. Maheswari : Managerial Economics, Sultan Chand.
2. Suma Damodaran : Managerial Economics, Oxford 2011.
3. Dr. B. Kuberudu and Dr. T. V. Ramana : Managerial Economics & Financial Analysis, Himalaya Publishing House 2011.
4. Vanitha Agarwal : Managerial Economics, Pearson Publications 2011.
5. Sanjay Dhameja : Financial Accounting for Managers, Pearson.
6. Maheswari : Financial Accounting, Vikas Publications.
7. S. A. Siddiqui & A. S. Siddiqui : Managerial Economics and Financial Analysis, New Age International Publishers, 2012.

DATA BASE MANAGEMENT SYSTEMS LAB

II Year – II Semester

Lecture: 0	Practical: 4	Internal Marks: 40
Credits: 2	Tutorial: 0	External Marks: 60

PREREQUISITES: -

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Create own database.
2. Manipulate data in database using SQL language.
3. Experiment with various SQL queries with database created
4. Write programs using PL/SQL language.
5. Create triggers using PL/SQL.

LIST OF LAB EXPERIMENTS:

1. Introduction to SQL: DDL, DML, DCL, TCL.
2. Queries for Creating Tables with Constraints, Views.
3. Example SQL Queries using select.
4. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN).
5. Queries using Group By, Order By, and Having Clauses and Working with Index, Sequence, Synonym.
6. Queries to facilitate acquaintance of Built-In Functions, String Functions, Numeric Functions, Date Functions and Conversion Functions.
7. Queries on Joins and Correlated Sub-Queries.
8. Write a PL/SQL Code using Basic Variable, Anchored declarations, and Usage of Assignment Operation.
9. Write a PL/SQL Code Bind and Substitution Variables. Printing in PL/SQL.
10. Write a PL/SQL block using SQL and Control Structures in PL/SQL.
11. Write a PL/SQL Code using Cursors, Exceptions and Triggers.
12. Write a PL/SQL Code using Procedures, Functions, and Packages.

TEXT BOOKS :

1) ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson
2) ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, TMH.
3) SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande.
4) Data Base Management System, Oracle SQL and PL/SQL, Pranab kumar Das Gupta, P Radha Krishna, PHI.

OPERATING SYSTEMS &LINUX PROGRAMMING LAB

II Year – II Semester

Lecture: 0	Practical: 4	Internal Marks: 40
Credits: 2	Tutorial: 0	External Marks: 60

PREREQUISITES: C programming

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Implement various basic functionalities of operating systems
2. Illustrate kernel functionalities using LINUX

LIST OF LAB EXPERIMENTS:

Operating Systems:

1. Simulate the following CPU scheduling algorithms: a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate Bankers Algorithm for Dead Lock Avoidance
3. Simulate Bankers Algorithm for Dead Lock Detection.
4. Simulate the placement algorithms in Multiprogramming
5. Simulate the following page replacement algorithms: a) FIFO b) LRU c) Optimal
6. Simulate the following File allocation strategies: a) Sequenced b) Indexed c) Linked

Linux Programming:

1. a) Study of Unix/Linux general purpose utility command list: man,who,cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown.

   b) Study of vi editor. c) Study of Bash shell, Bourne shell and C shell in Unix operating system.
2. Write a C program that makes a copy of a file using standard I/O, and system calls
3. Write a C program to emulate the UNIX ls –l command.
4. Write a C program that illustrates how to execute two commands concurrently with a command pipe.

Ex: - ls –l | sort

5. Write a C program that illustrates two processes communicating using shared memory
6. Write a C program to simulate producer and consumer problem using semaphores
7. Write C program to create a thread using pthreads library and let it run its function.
8. Write a C program to illustrate concurrent execution of threads using pthreads library.

PYTHON PROGRAMMING LAB

II Year – II Semester

Lecture: 0	Practical: 4	Internal Marks: 40
Credits: 2	Tutorial: 0	External Marks: 60

PREREQUISITES:

COURSE OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Structure simple Python programs for solving problems.
2. Decompose a Python program into functions.
3. Represent compound data using Python lists, tuples, and dictionaries.
4. Read and write data from/to files in Python Programs.
5. To build software for real needs.

Concepts to be covered:

- **Introduction:**Variables,Assignment,Keywords, Comments, Input-Output, Indentation
- **Types, Operators and Expressions:** Datatypes, Operators, Control flow statements
- **Data Structures:** Lists, Tuples, Sets, Dictionary, Sequences, Comprehensions
- **Functions**: Types of Arguments, Anonymous, Fruitful and Lambda Functions.
- **Python Packages**: Installation and Importing packages, Brief tour of packages like System, math, random, date and time, Numpy, Matplotlib, Multi-threading, scikit-learn and Internet Access.
- **OOPs using Python**
- **Exception handling in python**

Lab Exercises:

1. Write a program to perform various list of operations(eg: Arithmetic, logical, bitwise etc) in python.
2. Write a program to implement control flow statements.
3. Write a programs implementing various predefined function of Lists, Sets, Tuples and Dictionaries.
4. Write a program covering various arguments for a function.
5. Write a program to implement various types of functions.
6. Write a program to implement recursion.

7. Write a program to implement command line arguments.
8. Write a program to create a class and its constructors .
9. Write a program to implement inheritance.
10. Write a program for exception handling.
11. Write a program to perform various linear algebra operations like finding eigen vales and vectors, determinant for a matrix.
12. Write a program to read a file.
13. Write a program to use System,math etc packages.
14. Write a program for visualizing the data using matplotlib package .
15. Write a program to access data from the web and validate it.
16. Write a program to perform multi threading.

TEXT BOOKS

1. Learning Python, Mark Lutz, Orielly
2. Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.
3. John V Guttag, ―Introduction to Computation and Programming Using Python‘‘, Revised and expanded Edition, MIT Press , 2013.

Reference Books:

1. Think Python, Allen Downey, Green Tea Press
2. Core Python Programming, W.Chun, Pearson.
3. Introduction to Python, Kenneth A. Lambert, Cengage
4. “Python in easy steps In Easy Steps”, Mike MC Grath, illustrated edition, In easy steps 2013 publishers.
5. Professional Python Frameworks: Web 2.0 Programming, Dana Moore, Raymond Budd, William Wright, Wrox Publication, ISBN: 978-0-470-13809-0, October 2007.
6. “Introduction to Programming Concepts with Case Studies in Python”, Göktürk Üçoluk Sinan Kalkan, Springer