

Group B 1st & 2nd Sem (SESSION 2024-2025)**B.Tech in Computer Science Engineering
SESSION 2024-2028****SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100110	Engineering Physics	3	0	0	3
2.	100102	Engineering Mathematics-I	3	1	0	4
3.	100111	Programming for Problem Solving	3	0	0	3
4.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
5.	100113	IT Workshop	2	0	0	2
6.	100114	Basic Electronics Engineering	3	0	0	3
7.	100110P	Engineering Physics Lab	0	0	2	1
8.	100111P	Programming for Problem Solving Lab	0	0	2	1
9.	100113P	IT Workshop Lab	0	0	2	1
10.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100215	Engineering Chemistry	3	0	0	3
2.	100202	Engineering Mathematics-II	3	1	0	4
3.	100216	Communicative English	3	0	0	3
4.	100220P	Sports/Yoga/NCC/NSS	0	0	2	1
5.	100218	Python Programming	2	0	0	2
6.	100219	Introduction to Web Design	3	0	0	3
7.	100215P	Engineering Chemistry Lab	0	0	2	1
8.	100216P	Communicative English Lab	0	0	2	1
9.	100218P	Python Programming Lab	0	0	2	1
10.	100219P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)**B. Tech (Computer Science & Engineering
(IoT & Cyber Security with Block Chain Technology))****SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100110	Engineering Physics	3	0	0	3
2.	100102	Engineering Mathematics-I	3	1	0	4
3.	100111	Programming for Problem Solving	3	0	0	3
4.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
5.	100113	IT Workshop	2	0	0	2
6.	100114	Basic Electronics Engineering	3	0	0	3
7.	100110P	Engineering Physics Lab	0	0	2	1
8.	100111P	Programming for Problem Solving Lab	0	0	2	1
9.	100113P	IT Workshop Lab	0	0	2	1
10.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100215	Engineering Chemistry	3	0	0	3
2.	100202	Engineering Mathematics-II	3	1	0	4
3.	100216	Communicative English	3	0	0	3
4.	100220 P	Sports/Yoga/NCC/NSS	0	0	2	1
5.	100218	Python Programming	2	0	0	2
6.	100219	Introduction to Web Design	3	0	0	3
7.	100215 P	Engineering Chemistry Lab	0	0	2	1
8.	100216 P	Communicative English Lab	0	0	2	1
9.	100218 P	Python Programming Lab	0	0	2	1
10.	100219 P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)

**B.Tech in Computer Science & Engineering (AI)
SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100110	Engineering Physics	3	0	0	3
2.	100102	Engineering Mathematics-I	3	1	0	4
3.	100111	Programming for Problem Solving	3	0	0	3
4.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
5.	100113	IT Workshop	2	0	0	2
6.	100114	Basic Electronics Engineering	3	0	0	3
7.	100110P	Engineering Physics Lab	0	0	2	1
8.	100111P	Programming for Problem Solving Lab	0	0	2	1
9.	100113P	IT Workshop Lab	0	0	2	1
10.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100215	Engineering Chemistry	3	0	0	3
2.	100202	Engineering Mathematics-II	3	1	0	4
3.	100216	Communicative English	3	0	0	3
4.	100220P	Sports/Yoga/NCC/NSS	0	0	2	1
5.	100218	Python Programming	2	0	0	2
6.	100219	Introduction to Web Design	3	0	0	3
7.	100215P	Engineering Chemistry Lab	0	0	2	1
8.	100216P	Communicative English Lab	0	0	2	1
9.	100218P	Python Programming Lab	0	0	2	1
10.	100219P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)

**B.Tech in Computer Science & Engineering (AI & ML)
SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100110	Engineering Physics	3	0	0	3
2.	100102	Engineering Mathematics-I	3	1	0	4
3.	100111	Programming for Problem Solving	3	0	0	3
4.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
5.	100113	IT Workshop	2	0	0	2
6.	100114	Basic Electronics Engineering	3	0	0	3
7.	100110P	Engineering Physics Lab	0	0	2	1
8.	100111P	Programming for Problem Solving Lab	0	0	2	1
9.	100113P	IT Workshop Lab	0	0	2	1
10.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100215	Engineering Chemistry	3	0	0	3
2.	100202	Engineering Mathematics-II	3	1	0	4
3.	100216	Communicative English	3	0	0	3
4.	100220P	Sports/Yoga/NCC/NSS	0	0	2	1
5.	100218	Python Programming	2	0	0	2
6.	100219	Introduction to Web Design	3	0	0	3
7.	100215P	Engineering Chemistry Lab	0	0	2	1
8.	100216P	Communicative English Lab	0	0	2	1
9.	100218P	Python Programming Lab	0	0	2	1
10.	100219P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)

**B.Tech in Computer Science & Engineering (Data Science)
SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100110	Engineering Physics	3	0	0	3
2.	100102	Engineering Mathematics-I	3	1	0	4
3.	100111	Programming for Problem Solving	3	0	0	3
4.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
5.	100113	IT Workshop	2	0	0	2
6.	100114	Basic Electronics Engineering	3	0	0	3
7.	100110P	Engineering Physics Lab	0	0	2	1
8.	100111P	Programming for Problem Solving Lab	0	0	2	1
9.	100113P	IT Workshop Lab	0	0	2	1
10.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100215	Engineering Chemistry	3	0	0	3
2.	100202	Engineering Mathematics-II	3	1	0	4
3.	100216	Communicative English	3	0	0	3
4.	100220P	Sports/Yoga/NCC/NSS	0	0	2	1
5.	100218	Python Programming	2	0	0	2
6.	100219	Introduction to Web Design	3	0	0	3
7.	100215P	Engineering Chemistry Lab	0	0	2	1
8.	100216P	Communicative English Lab	0	0	2	1
9.	100218P	Python Programming Lab	0	0	2	1
10	100219P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)**B.Tech in Computer Science & Engineering (IoT)****SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100110	Engineering Physics	3	0	0	3
2.	100102	Engineering Mathematics-I	3	1	0	4
3.	100111	Programming for Problem Solving	3	0	0	3
4.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
5.	100113	IT Workshop	2	0	0	2
6.	100114	Basic Electronics Engineering	3	0	0	3
7.	100110P	Engineering Physics Lab	0	0	2	1
8.	100111P	Programming for Problem Solving Lab	0	0	2	1
9.	100113P	IT Workshop Lab	0	0	2	1
10.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100215	Engineering Chemistry	3	0	0	3
2.	100202	Engineering Mathematics-II	3	1	0	4
3.	100216	Communicative English	3	0	0	3
4.	100220P	Sports/Yoga/NCC/NSS	0	0	2	1
5.	100218	Python Programming	2	0	0	2
6.	100219	Introduction to Web Design	3	0	0	3
7.	100215P	Engineering Chemistry Lab	0	0	2	1
8.	100216P	Communicative English Lab	0	0	2	1
9.	100218P	Python Programming Lab	0	0	2	1
10.	100219P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)**B.Tech in Computer Science & Engineering (Networks)****SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100110	Engineering Physics	3	0	0	3
2.	100102	Engineering Mathematics-I	3	1	0	4
3.	100111	Programming for Problem Solving	3	0	0	3
4.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
5.	100113	IT Workshop	2	0	0	2
6.	100114	Basic Electronics Engineering	3	0	0	3
7.	100110P	Engineering Physics Lab	0	0	2	1
8.	100111P	Programming for Problem Solving Lab	0	0	2	1
9.	100113P	IT Workshop Lab	0	0	2	1
10.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100215	Engineering Chemistry	3	0	0	3
2.	100202	Engineering Mathematics-II	3	1	0	4
3.	100216	Communicative English	3	0	0	3
4.	100220P	Sports/Yoga/NCC/NSS	0	0	2	1
5.	100218	Python Programming	2	0	0	2
6.	100219	Introduction to Web Design	3	0	0	3
7.	100215P	Engineering Chemistry Lab	0	0	2	1
8.	100216P	Communicative English Lab	0	0	2	1
9.	100218P	Python Programming Lab	0	0	2	1
10.	100219P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)**B.Tech in Computer Science & Engineering (Cyber Security)****SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100110	Engineering Physics	3	0	0	3
2.	100102	Engineering Mathematics-I	3	1	0	4
3.	100111	Programming for Problem Solving	3	0	0	3
4.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
5.	100113	IT Workshop	2	0	0	2
6.	100114	Basic Electronics Engineering	3	0	0	3
7.	100110P	Engineering Physics Lab	0	0	2	1
8.	100111P	Programming for Problem Solving Lab	0	0	2	1
9.	100113P	IT Workshop Lab	0	0	2	1
10.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
1.	100215	Engineering Chemistry	3	0	0	3
2.	100202	Engineering Mathematics-II	3	1	0	4
3.	100216	Communicative English	3	0	0	3
4.	100220P	Sports/Yoga/NCC/NSS	0	0	2	1
5.	100218	Python Programming	2	0	0	2
6.	100219	Introduction to Web Design	3	0	0	3
7.	100215P	Engineering Chemistry Lab	0	0	2	1
8.	100216P	Communicative English Lab	0	0	2	1
9.	100218P	Python Programming Lab	0	0	2	1
10.	100219P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)**B.Tech in Information Technology****SEMESTER –I**

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
11.	100110	Engineering Physics	3	0	0	3
12.	100102	Engineering Mathematics-I	3	1	0	4
13.	100111	Programming for Problem Solving	3	0	0	3
14.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
15.	100113	IT Workshop	2	0	0	2
16.	100114	Basic Electronics Engineering	3	0	0	3
17.	100110P	Engineering Physics Lab	0	0	2	1
18.	100111P	Programming for Problem Solving Lab	0	0	2	1
19.	100113P	IT Workshop Lab	0	0	2	1
20.	100114P	Basic Electronics Engineering Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
11.	100215	Engineering Chemistry	3	0	0	3
12.	100202	Engineering Mathematics-II	3	1	0	4
13.	100216	Communicative English	3	0	0	3
14.	100220P	Sports/Yoga/NCC/NSS	0	0	2	1
15.	100218	Python Programming	2	0	0	2
16.	100219	Introduction to Web Design	3	0	0	3
17.	100215P	Engineering Chemistry Lab	0	0	2	1
18.	100216P	Communicative English Lab	0	0	2	1
19.	100218P	Python Programming Lab	0	0	2	1
20.	100219P	Introduction to Web Design Lab	0	0	2	1
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)

B.Tech in Electrical & Electronics Engineering

SEMESTER –I

Sl. No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
21.	100110	Engineering Physics	3	0	0	3
22.	100102	Engineering Mathematics-I	3	1	0	4
23.	100111	Programming for Problem Solving	3	0	0	3
24.	100106	Basic Electrical Engineering	3	0	0	3
25.	100112	Workshop Practices	2	0	0	2
26.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
27.	100110P	Engineering Physics Lab	0	0	2	1
28.	100111P	Programming for Problem Solving Lab	0	0	2	1
29.	100106P	Basic Electrical Engineering Lab	0	0	2	1
30.	100112P	Workshop Practices Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl. No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
21.	100215	Engineering Chemistry	3	0	0	3
22.	100202	Engineering Mathematics-II	3	1	0	4
23.	100216	Communicative English	3	0	0	3
24.	100220P	Sports/YogaNCC/NSS	0	0	2	1
25.	100209	Basic Electronics	3	0	0	3
26.	100217	Engineering Graphics & Design	1	0	0	1
27.	100215P	Engineering Chemistry Lab	0	0	2	1
28.	100216P	Communicative English Lab	0	0	2	1
29.	100209P	Basic Electronics Lab	0	0	2	1
30.	100217P	Engineering Graphics & Design Lab	0	0	4	2
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)**B.Tech in Electrical Engineering****SEMESTER –I**

Sl. No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
31.	100110	Engineering Physics	3	0	0	3
32.	100102	Engineering Mathematics-I	3	1	0	4
33.	100111	Programming for Problem Solving	3	0	0	3
34.	100106	Basic Electrical Engineering	3	0	0	3
35.	100112	Workshop Practices	2	0	0	2
36.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
37.	100110P	Engineering Physics Lab	0	0	2	1
38.	100111P	Programming for Problem Solving Lab	0	0	2	1
39.	100106P	Basic Electrical Engineering Lab	0	0	2	1
40.	100112P	Workshop Practices Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl. No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
31.	100215	Engineering Chemistry	3	0	0	3
32.	100202	Engineering Mathematics-II	3	1	0	4
33.	100216	Communicative English	3	0	0	3
34.	100220P	Sports/YogaNCC/NSS	0	0	2	1
35.	100209	Basic Electronics	3	0	0	3
36.	100217	Engineering Graphics & Design	1	0	0	1
37.	100215P	Engineering Chemistry Lab	0	0	2	1
38.	100216P	Communicative English Lab	0	0	2	1
39.	100209P	Basic Electronics Lab	0	0	2	1
40.	100217P	Engineering Graphics & Design Lab	0	0	4	2
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)**B.Tech in Electronics & Communication Engineering****SEMESTER –I**

Sl. No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
41.	100110	Engineering Physics	3	0	0	3
42.	100102	Engineering Mathematics-I	3	1	0	4
43.	100111	Programming for Problem Solving	3	0	0	3
44.	100106	Basic Electrical Engineering	3	0	0	3
45.	100112	Workshop Practices	2	0	0	2
46.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
47.	100110P	Engineering Physics Lab	0	0	2	1
48.	100111P	Programming for Problem Solving Lab	0	0	2	1
49.	100106P	Basic Electrical Engineering Lab	0	0	2	1
50.	100112P	Workshop Practices Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl. No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
41.	100215	Engineering Chemistry	3	0	0	3
42.	100202	Engineering Mathematics-II	3	1	0	4
43.	100216	Communicative English	3	0	0	3
44.	100220P	Sports/YogaNCC/NSS	0	0	2	1
45.	100209	Basic Electronics	3	0	0	3
46.	100217	Engineering Graphics & Design	1	0	0	1
47.	100215P	Engineering Chemistry Lab	0	0	2	1
48.	100216P	Communicative English Lab	0	0	2	1
49.	100209P	Basic Electronics Lab	0	0	2	1
50.	100217P	Engineering Graphics & Design Lab	0	0	4	2
TOTAL						20

Group B 1st & 2nd Sem (SESSION 2024-2025)**B.Tech in Instrumentation Engineering****SEMESTER –I**

Sl. No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
51.	100110	Engineering Physics	3	0	0	3
52.	100102	Engineering Mathematics-I	3	1	0	4
53.	100111	Programming for Problem Solving	3	0	0	3
54.	100106	Basic Electrical Engineering	3	0	0	3
55.	100112	Workshop Practices	2	0	0	2
56.	100115P	Swachha Bharat Mission (SBM)	0	0	2	1
57.	100110P	Engineering Physics Lab	0	0	2	1
58.	100111P	Programming for Problem Solving Lab	0	0	2	1
59.	100106P	Basic Electrical Engineering Lab	0	0	2	1
60.	100112P	Workshop Practices Lab	0	0	2	1
TOTAL						20

SEMESTER –II

Sl. No.	Course Code	Course Title	Hours Per Week			Total Credits
			Lecture	Tutorial	Practical	
51.	100215	Engineering Chemistry	3	0	0	3
52.	100202	Engineering Mathematics-II	3	1	0	4
53.	100216	Communicative English	3	0	0	3
54.	100220P	Sports/YogaNCC/NSS	0	0	2	1
55.	100209	Basic Electronics	3	0	0	3
56.	100217	Engineering Graphics & Design	1	0	0	1
57.	100215P	Engineering Chemistry Lab	0	0	2	1
58.	100216P	Communicative English Lab	0	0	2	1
59.	100209P	Basic Electronics Lab	0	0	2	1
60.	100217P	Engineering Graphics & Design Lab	0	0	4	2
TOTAL						20

Course Code-100215

Engineering Chemistry

3 0 0 3

UNIT 1.0- Atomic and Molecular Structure

8 hrs

Electromagnetic radiations, Dual nature of electron and Heisenberg uncertainty Principle. Photoelectric effect, Planck's theory. Principles for the combination of atomic orbitals to form a molecular diagram of molecular orbitals. Bent's rule, VSEPR theory (typical example) co-ordination numbers and geometries. Isomerism in transition metal compounds. Metal Carbonyls; Synthesis and Structure.

UNIT 2.0- Spectroscopy

6 hrs

Principle of rotational and vibrational spectroscopy, selection rule for application in diatomic molecules, elementary idea of electronic spectroscopy, UV-VIS spectroscopy with related to rules and its applications. Basic Principle of nuclear Magnetic resonance spectroscopy with applications.

UNIT 3.0 -Electrochemistry and Fuels

6 hrs

Nernst equation, EMF and electrochemical cell, the introduction of corrosion, corrosion mechanism, types of corrosion, water line corrosion, stress corrosion, pitting corrosion, Lead acid storage cell, leclanche cell. Calorific value of fuels, proximate and ultimate analysis of coals, fuel cells, Bio fuels.

UNIT 4.0- Water Chemistry

8 hrs

Hardness of water, estimation of water hardness by EDTA and Alkalinity method. Removal of the hardness of water- soda lime process, zeolite process, Ion exchange process, Boiler problem, sludge, and scale formation, priming and foaming, Boiler corrosion, and Caustic embrittlement.

UNIT 5.0 - Polymer and Plastics

8 hrs

Polymerization techniques (free radical, ionic, and co-ordination mechanism)Preparation properties, and technical application of phenol-formaldehyde resins, elastomers, synthetic rubbers (Buna-S, Buna-N, neoprene). Inorganic polymers, Silicones, adhesives, epoxy resins. the structural difference between thermoplastic and thermosetting Plastics, the Importance of commercially important thermoplastics and thermosets; Poly ethylene, Polyvinyl chloride, Polystyrene.

UNIT 6.0- Organic Reactions and Synthesis of A Drug Molecul

6 hrs

Introduction to intermediate and reaction involving Substitution, addition, elimination, oxidation-reduction. Diels Elder cyclization and epoxide ring opening reactions, synthesis of commonly used drug molecules like aspirin.

Test/ Reference:-

1. University Chemistry, B.H. Mahan,Pearson
2. Chemistry, principles and application, M.J. Sienko and R.A. Plane, McGraw Hill International
3. Fundamentals of molecular Spectroscopy, C.N. Banwell , McGraw Hill International
4. Engineering Chemistry (NPTEL Web- Book), B.L. Tembe, Kamaluddin and M.S. Krishnan, NPTEL
5. Physical Chemistry, P.W. Atkins, Oxford University Press
6. A text book of engineering chemistry, S. Chawala, Dhanpat Rai Publication
7. General Chemistry Part 1, R. Sarkar, New Central Book agency

Group B 1st & 2nd Sem (SESSION 2024-2025)

Course Code-100215P Engineering Chemistry Lab
Perform any 10 Experiments

0 0 2 1

1. To estimate hardness of water by alkalinity method
2. To estimate hardness of water by EDTA method
3. To remove hardness of water by ion exchange method
4. Determination of pH of a given acid solution using a standard sodium hydroxide solution
5. Determination of surface tension and viscosity
6. Chemical analysis of salt (Acid radical and basic radical)
7. Adsorption of acetic acid by charcoal
8. Test of adulteration of fat butter, sugar, turmeric powder, chilli powder and pepper
9. Saponification/ acid value of an oil
10. Identification of organic substances and their functional groups
11. Potentiometric determination of redox potentials and emf
12. Synthesis of drug/ polymer like ASPRIN/ Urea- formaldehyde resin
13. Thin layer chromatography
14. Analysis of flue gas by orsatapparatus



Course Code-100102 Engineering Mathematics–I 3 1 0 4

Unit- 1.0: Linear Algebra-I 7 hrs

Elementary Row operations, Gauss -Jordan Method for finding the inverse of Matrix, Complex Matrix : Hermitian , Skew Hermitian and Unitary Matrix, Vector space, Sub Spaces, Linear dependence and Independences of Vectors, Linear Span, Basis, Dimension, Extension of basis of subspace, The rank of a matrix, Row and column space, Solvability of system of linear equations.

Unit- 2.0: Linear Algebra-II 7 hrs

Linear Transformations, Kernel and Range of linear transformation, Matrix Representation of a linear transformation, Rank-Nullity Theorem, Eigen Value and Eigen Vectors, Properties of Eigen vectors, Eigen Bases, Orthogonal Transformation, Similarity Transformation, Matrix Diagonalization, Cayley- Hamilton Theorem.

Unit- 3.0: Calculus for single variable 7 hrs

Indeterminate form, L'Hospital Rule, Rolle's Theorem, Mean Value Theorem, Expansion of function (single variable), Taylor and Maclaurin Series, Riemann Integration, Riemann Sum, Improper Integrals, Beta and Gamma function and their properties.

Unit- 4.0 : Multivariable Calculus (Differentiation) 7 hrs

Function with two or more variable, Limit, continuity and Partial differentiation, Total Differentiation

Taylor's series and Maclaurin's series for function with two variable, Jacobian, Maxima and Minima, Method of Lagrange's multiplier.

Unit-5.0: Multivariable Calculus (Integration) 7 hrs

Double Integral, change of order of integration, Triple integral, Change of Variable in a Double and Triple Integrals, Change to polar coordinate, Change to cylindrical coordinate, Change to spherical polar coordinate, Application to area and volume using double and triple integral

Unit- 6.0: Vector Calculus 7 hrs

Scalar and vector fields, Gradient, Directional derivative, Divergence, Curl and their properties, Line integral, Green's theorem in plane (without proof), Surface integral, Stoke's theorem (without proof), Volume Integral, Gauss-Divergence' theorem (without proof).

Test/ Reference:-

1. AICTE's Prescribed Textbook: Mathematics-I (Calculus & Linear Algebra), Reena Garg, Khanna Book Publishing Co. ISBN-10 9391505171
2. Advanced Engineering Mathematics, Chandrika Prasad & Reena Garg, Khanna Book Publishing Co., 2021. ISBN 10: 9386173522 / ISBN 13: 9789386173522.
3. Higher Engineering Mathematics, B.V. Ramana, Tata McGraw Hill New Delhi, 11th Reprint, 2010, ISBN-10 007063419X ISBN-13 978- 0070634190.
4. Advanced Engineering Mathematics, SrkIyengar Rk Jain, Narosa, 5th Edition, ISBN-10 8184875606
SBN-13 978-8184875607
5. Advanced Engineering Mathematics, Erwin Kreyszig, 9th Edition, John Wiley & Sons, 2006.

Group B 1st & 2nd Sem (SESSION 2024-2025)

Course Code-100216 Communicative English

3 0 0 3

Unit-1.0: Vocabulary Building

7 hrs

Nature of Word Formation; Root Word and Morpheme; Prefix and Suffix; Foreign Expressions in English; Synonym and Antonym; Homophone and Homograph; Abbreviation and Acronym.

Unit-2.0: Basic Writing Skills

7 hrs

Parts of Speech: Types of Words; Structures of Sentence; Kind of Sentence; Phrase and Clause; Punctuation Marks; Capitalization; Tenses: Present, Past and Future; Voices: Active and Passive; Formation of Questions using Primary Auxiliaries, Modals and Wh-Words.

Unit-3.0: Common Errors in English

7 hrs

Articles; Prepositions; Modifiers; Subject-Verb Agreement; Noun-Pronoun agreement; Redundancies; Cliches; Spelling Error.

Unit-4.0: Principles of Appropriate Writing

7 hrs

Defining: Describing, Classifying and Exemplifying; Introduction, Body, and Conclusion; References, Quotations and Illustrations; Organizing the Paragraphs in a Document; 7Cs of the Professional Writing: Clear, Concise, Concrete, Correct, Coherent, Complete and Courteous.

Unit-5.0: Practices of Formal Writing

7 hrs

Formal Letter: Cover-Letter and Application; Resume Writing; Report Writing; Minutes of Meeting; Memorandum; Notice; Essay Writing: Personal and Impersonal; Email Writing Etiquettes; Article Writing; Writing for Current Social Media.

Unit-6.0: Comprehension of Written English

7 hrs

Of Studies (Essay) by Sir Francis Bacon; *The Sun Rising* (Poem) by John Donne; *The Last Leaf* (Story) by O Henry; Unseen/Untaught Passage.

Test/ Reference:-

1. English language and communication skills for engineers, Sanjay Kumar, Pushp lata, Oxford university Press
2. Communicative English for Technical student, Dr. Bijay Bhadur Singh and Dr. Kalpana Sinha, Foundation publishing House (FPM)
3. Communication Skill (As per VRV syllabus 2018), Sanjay Kumar and Pushp lata, Oxford University Press
4. A course in Listening & Speaking, V. Sasi Kumar, P. Kiranmai Dutt and Geetha Rajeevan, Foundation Books

Course Code-100216P

Communicative English Lab

0 0 2 1

Perform any 10 Experiments

Language Lab of English includes Listening Comprehension, Reading Comprehension, Speaking Skills: Phonetics, International Phonetic Alphabet Symbols (IPAS), Sounds: Vowels and Consonants, Pronunciation, Intonation, Stress and Rhythm, Just A Minute Technique (JAM), Communication: Verbal and Non-Verbal; Ethical Usage of Artificial Intelligence, Self-Introduction: Social, Academic and Professional; Interview: Online and Offline; Oral Presentation, Debate, Group Discussion, Group-Activities, and Brainstorming Vocabulary Activities.

1. Listening Comprehension and Speed (Software)
2. Reading Comprehension and Speed (Software)
3. Pronunciation: Learning and Test (Software)
4. Self-Introduction: Social, Academic and Professional
5. English Typing: Microsoft Word Document (MS Word), and Microsoft Power Point Presentation (PPT)
6. Oral Presentation
7. Interview: Online and Offline
8. Just A Minute Technique (JAM) and Extempore
9. Debate
10. Group Discussion
11. Activities: Role Play, Peer Activities, and Group Activities
12. Anchoring and Addressing: an Assembly, a Meeting, a Seminar, a Party

Course Objectives:

(a) Encouraging creativity and innovation: The course could aim to foster a culture of creativity and innovation among engineering students. It could provide opportunities for students to generate and develop new ideas, think critically, and come up with innovative solutions to real-world problems. This objective could be achieved through brainstorming sessions, design thinking exercises, and hands-on projects.

(b) Enhancing problem-solving skills: The course could focus on enhancing the problem-solving skills of engineering students. It could provide training on various problem-solving techniques, such as root cause analysis, critical thinking, and decision-making. Students may learn how to identify and analyse complex problems, develop feasible solutions, and implement them effectively.

(c) Developing project management skills: The course could aim to develop project management skills among engineering students. It could cover topics such as project planning, scheduling, budgeting, and risk management. Students may learn how to manage resources, communicate effectively, and work collaboratively in a project-based environment.

(d) Promoting interdisciplinary collaboration: The course could encourage interdisciplinary collaboration among engineering students. It could provide opportunities for students from different engineering disciplines to work together on innovative projects. This could foster cross-disciplinary learning, encourage diverse perspectives, and promote teamwork and collaboration skills.

(e) Facilitating practical application of engineering concepts: The course could focus on the practical application of engineering concepts and principles. It could provide students with opportunities to apply their theoretical knowledge to real-world projects, prototypes, or simulations. Students may learn how to translate engineering theories into practical solutions and develop hands-on experience in implementing innovative projects.

Pre-requisite: Nil

Course Outcome:

1. Developed innovative projects: Students may have successfully developed innovative projects that demonstrate their creativity, problem-solving skills, and technical competence. These projects could be prototypes, models, simulations, or practical solutions to real-world problems, showcasing their ability to apply engineering concepts in a creative and innovative manner.

2. Improved critical thinking and problem-solving skills: Students may have honed their critical thinking and problem-solving skills through various course activities, such as brainstorming, design thinking, and project development. They may have learned to analyse complex problems, identify viable solutions, and make informed decisions based on technical, economic, and social considerations.

3. Enhanced project management and teamwork skills: Students may have gained practical experience in managing projects, including planning, scheduling, budgeting, and risk management. They may have learned how to work effectively in a team, collaborate with diverse team members, and communicate project progress and results professionally.

4. Increased interdisciplinary knowledge and collaboration: Students may have gained exposure to interdisciplinary concepts and collaborated with peers from different engineering disciplines. They may have learned to appreciate diverse perspectives, leverage interdisciplinary knowledge, and work collaboratively to develop innovative solutions that integrate multiple domains of engineering.

5. Cultivated a mindset of innovation and entrepreneurship: Students may have developed a mindset of innovation and entrepreneurship, recognizing the importance of creativity,

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adaptability, and continuous improvement in engineering practice. They may have learned to identify opportunities, think critically, and take risks to develop and implement innovative projects with commercial or societal potential.

List of Reports:

Any topics related to innovative project.



Course Code-100217 Engineering Graphics and Design 1 0 0 1

Unit- 1.0: Introduction to Engineering Drawing

7hrs

Principles of Engineering Graphics and Their Significance, Usage of Drawing Instruments, Lettering, Conic Sections including the Rectangular Hyperbola (General Method Only); Cycloid, Epicycloid, Hypocycloid and Involute; Scales Plain, Diagonal and Vernier Scales

Unit- 2.0 Orthographic Projections

7hrs

Principles of Orthographic Projections - Conventions -Projections of Points and Lines Inclined to Both Planes; Projections of Planes Inclined Planes Auxiliary Planes.

Unit- 3.0 Projections of Regular Solids

7hrs

Types of Solids, Projects of Solids (Prism, pyramids, cone, and cylinder): Inclined to Both the Planes- Auxiliary Views; Draw Simple Annotation, Dimensioning and Scale.

Unit- 4.0 Sections and Sectional Views of Right Angular Solids

7hrs

Section of Solids (Prism, Cylinder, Pyramid, Cone), Auxiliary Views; Development of Surfaces Of Right Regular Solids- Prism, Pyramid, Cylinder And Cone; Draw The Sectional Orthographic Views of Geometrical Solids, Objects From Industry And Dwellings (Foundation To Slab Only).

Unit- 5.0 Isometric Projections

7hrs

Isometric Views, Compound Solids; Principles of Isometric Projection Isometric Scale, Conventions; Isometric Views of Lines, Planes, Simple and Conversion of Isometric Views toOrthographic Views And Vice-Versa, Conventions.

Unit- 6.0 Overview of Computer Graphics

7hrs

Listing the Computer Technologies that Impact on Graphical Communication, Demonstrating Knowledge of the Theory of CAD Software [Such As: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify And Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog Boxes And Windows, Shortcut Menus (Button Bars), The Command Line (Where Applicable), The Status Bar, Different Methods of Zoom as Used in CAD, Select and Erase Objects.; Isometric Views of Lines, Planes, Simple And Compound Solids.

Test/ Reference:-

1. Engineering Drawing, N.D. Bhatt, Charotar Publishing House, 53rd Edition, ISBN: 978-9380358277
2. A Textbook of Engineering Drawing, R.K. Dhawan, S. Chand Publishing, Revised Edition, ISBN: 978-8121929571
3. Engineering Drawing and Graphics, K. Venugopal, V. Prabhu Raja, New Age International Publishers, 3rd Edition, ISBN: 978-8122430120
4. Engineering Graphics with AutoCAD, D.M. Kulkarni, A.P. Rastogi, A.K. Sarkar, PHI Learning Pvt. Ltd., 1stEdition, ISBN: 978-8120337834

Course Code-100217P Engineering Graphics and Design Lab 0 0 4 2
Perform any 10 Experiments

1. (Which includes dimensioning methods, different types of line, construction of different polygon, divide the line and angle in parts, use of stencil)
2. Construction of Plane, Diagonal & Vernier Scales.
3. Construction of Ellipses, Parabolas, and Hyperbolas using the general method.
4. Construction of cycloid, epicycloid, hypocycloid, and involute of a circle.
5. Projection of Points and Lines inclined to both planes.
6. Projections of Planes (e.g., rectangular, triangular) in inclined positions.
7. Projection of Solids (prisms, pyramids, cones, and cylinders)
8. Drawing of Sections of Prisms, Cylinders, Pyramids, and Cones.
9. Development of Surfaces for prisms, pyramids, cylinders, and cones.
10. Construction of Isometric views of lines, planes, and simple solids.
11. Introduction to CAD Software.
12. Use of CAD software to draw basic geometric shapes, apply dimensions, and modify objects.



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1. Frame of Reference:

2 hrs

Non-Inertial frame of reference, rotating coordinate system, centripetal and Coriolis acceleration and its application in weather system.

2. Oscillations:

3 hrs

Harmonic Oscillator, Damped Harmonic motion – overdamped, critically Damped and lightly damped oscillators, Force Oscillators and Resonance.

Unit- 2.0

1. Optics:

4 hrs

Huygens's Principle, Superposition of Waves and interference of Light by wave front-splitting and amplitude-splitting; Young's double slit experiment, Michelson interferometer, Fraunhofer diffraction from single slit and circular aperture, Diffraction Grating and their resolving power

2. LASER:

4 hrs

Einstein's theory of matter-radiations interaction, Einstein's Coefficients (A and B), Amplification by population inversion, Different types of lasers – Gas Laser, Helium-Neon Laser, Solid State Laser (Ruby, Neodymium), Semiconductor Laser.

Unit- 3.0

1. Quantum Mechanics:

5 hrs

Compton Effect, Photoelectric Effect, Wave Particle duality, de Broglie's hypothesis, Heisenberg's Uncertainty Principle, Wave function and wave packets, phase and group velocities, Schrodinger's Wave Equation, Normalization, Expectation values, Eigenvalues and Eigenfunction.

2. Applications in One dimensions:

2 hrs

Application of Schrodinger Wave Equation for particle in one dimensional box – its wavefunction and eigenvalue of energy and momentum.

Unit- 4.0

1. Vector Calculus:

2 hrs

Gradient, Divergence and Curl, Line, Surface and Volume integrals, Gauss's Divergence theorem and Stokes' theorem in Cartesian Coordinate.

2. Electrostatics:

4 hrs

Gauss's Law and its applications, Divergence and Curl of Electrostatic fields, Electrostatic Potential, Boundary Conditions, Poisson's and Laplace's equations, Dielectrics, Polarization, Bound Charges, Electric displacement, Boundary Conditions in dielectrics.

Unit- 5.0

1. Magnetostatics:

4 hrs

Lorentz force, Biot-Savart and Ampere's circuital laws and their applications, Divergence and Curl of Magneto static fields, Magnetic vector potential, Force and torque on a magnetic dipole, Magnetic Materials, Magnetization, Bound currents, Boundary conditions.

2. Electrodynamics and Electromagnetic Waves:

4 hrs

Ohm's law, Motional EMF, Faraday's Law, Lenz's law, Self and mutual inductance, Energy stored in magnetic field, Maxwell's equations in vacuum and nonconducting medium, Continuity Equation, Poynting Theorem, Wave Equations: plain electromagnetic wave in vacuum and their transverse nature and Polarization.

Unit- 6.0

1. Introduction to Solids and Semi-Conductors:

3 hrs

Free electron theory of metal, fermi level, Bloch's theorem for particle in a periodic Potential, Kroning-Penney model and origin of energy band.

2. Electronic Materials:

3 hrs

Metals, semiconductors and insulators, intrinsic and extrinsic semiconductors, Carrier transport, diffusion and drift, P-N junction.

Test/ Reference:-

Group B 1st & 2nd Sem (SESSION 2024-2025)

1. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles, R. Eisberg R. Resnick, Wiley India Pvt. Ltd ISBN 978-81-265-0818-1
2. Theory of Vibration with Application, W.T. Thomson M. D. Dahleh, Pearson India ISBN 978-81-317-0482-0
3. Introduction to Electrodynamics, D.J. Griffiths, Pearson India, ISBN 978-93-325-5044-5
4. Electromagnetism, I.S. Grant, W. R. Phillips, Wiley India Pvt. Ltd ISBN 978-04-719-2712-9
5. The Feynman Lectures on Physics, R.P. Feynman R. B. Leighton, Pearson India ISBN 978-00-710-7458-2
6. Optics, Ajay Ghatak ,McGraw Hill ISBN 978-93-901-1359-0
7. Physics of Vibration and Waves, H. J. Pain, Wiley India Pvt. Ltd, ISBN 978-04-700-1296-3
8. Concept of Modern Physics, Arthur Beiser, McGraw Hill ISBN 978-93-513-4185-7
9. Introduction to Solid State Physics, C. Kittel , Wiley India Pvt. Ltd, ISBN 978-81-265-7843-6



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Perform any 10 Experiments

1. Determination of the capacitance and permittivity of the given material.
2. Determination of e/m of electron.
3. Determination of Planck's constant and Photoelectric Work Function using Photoelectric cell.
4. Verification of inverse square law using photocell.
5. Determination of Wavelength of (He-Ne) LASER using Diffraction Grating Method.
6. Calculation of Energy Band Gap of a semiconductor.
7. Determination of Dielectric constant using resonance method.
8. Determination of Wavelength of Sodium light by measuring the diameter of the Newton's Ring.
9. Determination of curvature of convex surface of a lens by Newton's ring.
10. Verification of existence of Bohr's Energy level with Frank-Hertz apparatus.
11. Determination of the Earth's horizontal magnetic field intensity and magnetic Moment of a magnet by employing magnetometer.
12. Verification of Faraday's Law and Lenz's Law of Electromagnetic Induction.



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Course Code-100202 Engineering Mathematics– II 3 1 0 4

Unit- 1.0 Complex Analysis – I 6 hrs

Functions of complex variable, limit, Continuity, Differentiability, Analytic function, Cauchy-Riemann Equations in Cartesian and polar form, harmonic function and harmonic conjugate.

Unit- 2.0 Complex Analysis – II 8 hrs

Line Integral, contour integrals, Cauchy theorem, Cauchy's Integral formula(without proof), Taylors series, zero of analytic functions, singularities, Laurent's series, residue, Cauchy residue theorem(without Proof) and its applications.

Unit- 3.0 Ordinary Differential Equations 8 hrs

Linear differential equations of nth Order with constant coefficients, solution of Homogeneous and Non-Homogeneous Equations, Equations with variable coefficients, Cauchy- Euler Equations, Method of Variation of Parameters.

Unit- 4.0 Sequence and Series 6 hrs

Introduction of Sequence and Series, Nature of series Tests of convergence of Series: Comparison test, D'Alembert ratio test, Cauchy's Root test, Raabe's test, Logarithmic test, Cauchy's condensation test.

Unit- 5.0 Laplace Transform 8 hrs

Laplace Transform, Existence theorem, properties of Laplace Transform, Laplace Transform of Periodic functions, Inverse Laplace Transform, convolution theorem. Application of Laplace Transform to solve Ordinary differential equations.

Unit- 6.0 Fourier Series 6 hrs

Fourier Series, Fourier Series for odd and even functions, Half range sine and cosine series, Parseval's theorem.

Test/ Reference:-

1. Advanced Engineering Mathematics, Kreyszig Erwin, John Wiley and Sons, 10th Edition, 2020 ISBN:978-0470-45836-5
2. Advanced Engineering Mathematics, Dass H.K., S Chand and Company pvt.Ltd., 22nd Edition, 2018 ISBN:978-93-5283-718-2
3. Higher Engineering Mathematics, Grewal B.S., Khanna Publishers, 44th Edition, 2023 ISBN:9788174091154
4. Complex Variables (Theory and Applications), Kasana H.S., PHI, 2nd Edition, 2015 ISBN:978-81-203-2641-5
5. A Text Book of Engineering Mathematics, Bali N.P., Goyal Manish Laxmi Publications, 9th Edition, 2014
6. Higher Engineering Mathematics, Ramana B.V., Tata McGraw Hill New Delhi, 11th Reprint, 2010, ISBN-10 007063419X ISBN-13 978- 0070634190
7. Differential Equations, Ross S.L., Wiley Publications, 3rd edition, 2016 ISBN:978-81-265—1537-0
8. Advanced Differential Equations, Raisinghania M.D., S.Chand and Company PVT.LTD., 18th Edition, 2015 ISBN:978-81-219-0893-1
9. Schaum's Outlines Complex Variables, Spiegel Murray R, Lipschutz Seymour, Schiller J John and Spellman Dennis, MC Graw Hill Education Private Ltd. 2nd Edition, 2010 ISBN:978-0-07-008538-1

Course Code-100111 Programming for Problem Solving

3 0 0 3

Unit- 1.0

Introduction to Programming

6 hrs

Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.). Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/ Pseudo code with examples. From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code.

Unit- 2.0

Operators, Conditional Branching and Loops

8 hrs

Arithmetic expressions/arithmetic operators, relational operators, logical operators, bitwise operators and precedence. Writing and evaluation of conditionals and consequent branching, Iteration and loops.

Unit- 3.0

Arrays and String

6 hrs

Array declaration & initialization, bound checking arrays (1-d, 2-d), character arrays and strings.

Unit- 4.0

Function, Recursion and Pointers

9 hrs

Functions (including using built in libraries), Parameter passing in functions, call by value, passing arrays to functions: Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc. Idea of pointers, Defining pointers, Use of Pointers in self- referential structures, idea of call by reference.

Unit- 5.0

User defined Data Types and File handling

8 hrs

Structure- defining, declaring, initializing; accessing structure members, processing of structure, array of structures, structures within structure, structure and function, type definition; Union— definition, declaration, accessing union members, initializing union. Introduction, file declaration, opening and closing a file, working with text and binary files, I/O operations on file, error handling, random access to files

Unit- 6.0

Basic Algorithms

5 hrs

Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required)

Test/ Reference:-

1. Programming in ANSI C 4th Ed,E Balagurusamy, McGraw Hill Education India Private Limited, ISBN-978-9339219666, 7th Edition
2. The C Programming Language 2e,W. Kernighan / Dennis Ritchie,Pearson Education India, 978-9332549449, 2nd Edition
3. Computer Fundamentals and Programming in C,ReemaThareja,Oxford University Press, ISBN- 978-9354977893, 3rd Edition

Course Code-100111P Programming for Problem Solving Lab 0 0 2 1

Perform any 10 Experiments

1. Tutorial 1: Problem solving using computers:
Lab1: Familiarization with programming environment
2. Tutorial 2: Variable types and type conversions:
Lab 2: Simple computational problems using arithmetic expressions
3. Tutorial 3: Branching and logical expressions:
Lab 3: Problems involving if-then-else structures
4. Tutorial 4: Loops, while and for loops:
Lab 4: Iterative problems e.g., sum of series
5. Tutorial 5: 1D Arrays: searching, sorting:
Lab 5: 1D Array manipulation
6. Tutorial 6: 2D arrays and Strings
Lab 6: Matrix problems, String operations
7. Tutorial 7: Functions, call by value:
Lab 7: Simple functions
8. Tutorial 8 &9: Numerical methods (Root finding, numerical differentiation, numerical integration):
Lab 8 and 9: Programming for solving Numerical methods problems
9. Tutorial 10: Recursion, structure of recursive calls
Lab 10: Recursive functions
10. Tutorial 11: Pointers, structures and dynamic memory allocation
Lab 11: Pointers and structures
11. Tutorial 12: File handling:
Lab 12: File operations

Objectives:

1. Understanding the importance of cleanliness and sanitation: The course could aim to create awareness about the significance of cleanliness and sanitation in maintaining personal health, environmental sustainability, and community well-being. It could cover topics such as waste management, sanitation practices, and the impact of poor sanitation on public health.
2. Developing skills for effective waste management: The course could provide training on various waste management techniques, such as waste segregation, composting, recycling, and proper disposal of hazardous waste. It could also emphasize the importance of reducing waste generation and promoting sustainable waste management practices.
3. Promoting behavioural change towards cleanliness: The course could focus on influencing positive behavioural change among individuals and communities towards cleanliness. It could include modules on promoting good hygiene practices, creating awareness about the harmful effects of littering and open defecation, and encouraging responsible waste disposal habits.
4. Creating awareness about Swachh Bharat Mission initiatives: The course could provide information about the Swachh Bharat Mission initiatives and campaigns launched by the Government of India to promote cleanliness and sanitation, such as Swachh Survekshan, Swachh Bharat Abhiyan, and Clean India Campaign. It could also discuss the progress made, challenges faced, and future prospects of the Swachh Bharat Mission.
5. Engaging in community participation and advocacy: The course could emphasize the importance of community participation in the Swachh Bharat Mission and provide tools and strategies for engaging with local communities to promote cleanliness and sanitation. It could also encourage advocacy for policy changes and innovations to address sanitation-related issues at the community, regional, and national levels.
6. Pre-requisite: Nil
7. Course Outcome:
8. Increased awareness and knowledge about cleanliness and sanitation: Participants of the course may gain a deeper understanding of the importance of cleanliness and sanitation, including the impact on personal health, environmental sustainability, and community well-being. They may learn about various waste management techniques, hygiene practices, and the initiatives of the Swachh Bharat Mission.
9. Enhanced skills for effective waste management: Participants may acquire practical skills related to waste management, such as waste segregation, composting, recycling, and proper disposal of hazardous waste. They may also develop skills in reducing waste generation and promoting sustainable waste management practices in their communities or workplaces.
10. Positive behavioral change towards cleanliness: The course may influence participants to adopt positive behavioral changes towards cleanliness, such as avoiding littering, practicing good hygiene habits, and promoting responsible waste disposal. Participants may develop a sense of responsibility towards maintaining cleanliness in their surroundings and actively contribute towards creating a cleaner environment.
11. Increased community participation and advocacy: Participants may become actively engaged in community participation and advocacy efforts related to cleanliness and sanitation. They may collaborate with local communities, government bodies, and non-governmental organizations (NGOs) to raise awareness, implement cleanliness initiatives,

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and advocate for policy changes or innovations to address sanitation-related issues.

12. Contribution towards Swachh Bharat Mission objectives: Participants may contribute towards the objectives of the Swachh Bharat Mission, such as promoting cleanliness, ensuring proper waste management, and eliminating open defecation. They may actively participate in Swachh Bharat Mission campaigns, initiatives, and activities, and make a positive impact on their communities and society at large.

13. List of Reports:

14. Any topics related to Swachh Bharat Mission



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Unit- 1.0

8 hrs

DC Circuit Analysis and Network Theorems: Concepts of Network, Active and Passive elements, voltage and current sources, concept of linearity and linear network, unilateral and bilateral elements. R L and C as linear elements. Source Transformation. Kirchhoff's Law, loop and nodal methods of analysis; star – delta transformation; Network Theorems: Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem. (Simple Numerical Problems)

Unit- 2.0

5 hrs

Magnetic Circuit: Magnetic circuit concepts, analogy between Electric & Magnetic circuits, Magnetic circuits with DC and AC excitation, Magnetic leakage. B-H curve, Hysteresis and Eddy Current losses, Magnetic circuit calculations.

Unit- 3.0

8 hrs

Steady State Analysis of Single-Phase AC Circuits: Sinusoidal, Square and Triangular waveforms—average and effective values, form and peak factors, concept of phasors, phasor representation of sinusoidally varying voltage and current. Analysis of series, parallel, and series – parallel RLC Circuits: Apparent, Active & Reactive Powers, Power factor, causes and problems of low power factor, power factor improvement. Resonance in Series and Parallel Circuits. (Simple Numerical Problems)

Unit- 4.0

5 hrs

Three Phase AC Circuits: Three Phase System – its necessity and advantages, meaning of phase sequence and star and delta connections, balanced supply and balanced load, line and phase voltage/ current relations, three phase power and its measurement. (Simple Numerical Problems)

Unit- 5.0

10 hrs

Introduction to DC Machines: Principle, Operation, Construction, and types of DC machines, e.m.f. equation of generator and torque equation of motor.

Single Phase Transformer: Principle of Operation, Construction, e.m.f. equation, losses in transformer, efficiency.

Three Phase Induction Motor: Principle, Operation, and Construction (Simple Numerical Problems)

Unit- 6.0

6 hrs

Soldering- Soldering and desoldering techniques, breadboard wiring, general-purpose PCB soldering/wiring.

Wiring-Types of residential and commercial wiring systems, general rules and guidelines for installation, load calculation and sizing of wire, rating of main switch, distribution board.

Test/ Reference:-

1. Basic Electrical Engineering, D.P. Kothari et al, McGraw-Hill Education 4th Edition, 2019
2. Electrical and Electronic Technology Edward Hughes, 12th edition, 2016
3. Principles Electrical Engineering and Electronics, V.K Mehata, Rohit Mehta, S Chand and Company 2nd edition, 2015
4. Basic Electrical Engineering, J. B. Gupta, Katson Publication
5. A textbook of Electrical Technology B. L. Thereja, A. K. Thereja Vol. 1, 2, and 3 S Chand Publication

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Perform any 10 Experiments

1. Verification of Kirchhoff's laws.
2. Verification of Superposition Theorem.
3. Verification of Thevenin's Theorem.
4. Verification of Norton's Theorem.
5. Verification of Maximum Power Transfer Theorem.
6. Measurement of power in 3 – ϕ circuit by Two Watt meter method and determination of its power factor.
7. Star to Delta and Delta to Star conversion of the three circuit.
8. Determination of Efficiency by load test of a 1 – ϕ Transformer.
9. To study the typical BHK house wiring
10. Study of safety precautions while working on electrical installations and necessity of earthing



Course Code-100112

Workshop Practices

2 0 0 2

Unit-1

Sheet Metal Working:

6 hrs

Sheet material: GI sheets, aluminium, tin plate, copper, brass etc; Tools: steel rule, vernier callipers, micrometer, sheet metal gauge, scriber, divider, punches, chisels, hammers, snips, pliers, stakes etc.; operations: scribing, bending, shearing, punching etc; Product development: hexagonal box with cap, funnel etc.

Unit-2

Joining:

6 hrs

Classifications of joining processes; Brazing, Soldering, and Mechanical Joints, Arc welding, Gas welding etc.

Unit-3

Pattern Making and Foundry Practice:

6 hrs

Pattern material: wood, cast iron, brass, aluminium, waxes etc.; Types of patterns: split, single piece, match plate etc; Tools: cope, drag, core, core prints, shovel, riddle, rammer, trowel, slick, lifter, sprue pin, bellow, mallet, vent rod, furnace etc. Moulding sands: green sand, dry sand, loam sand, facing sand etc., Sand casting: Sand preparation, mould making, melting, pouring, and cleaning

Unit-4

Fitting Shop

10 hrs

Introduction to Fitting; Fitting Tools: Files and their classification, Holding Tools, Cutting Tools, Measuring and Marking Tools, Thread Making Tools, Various Fitting Power Tools; Methods Of Filing: Cross Filing and Draw Filing, Other associated operations Marking. Sawing and Chipping; Safety and Precautions in Fitting Shop.

Unit-5

Carpentry Shop

7 hrs

Introduction to Carpentry Shop; Types of Wood; Seasoning of Wood: Types of Seasoning Methods; Defects in wood; Structure of Wood; Carpentry Tools; Measuring Tools, Marking Tools, Cutting Tools, Planning Tools, Drilling and Boring Tools, Holding Tools, Striking Tools, Auxiliary tools and materials used in Carpentry; Wood working Processes; Carpentry joints; wood Working Machines: Wood Working Lathe, Circular Saw, Thickness Planer, Band saw Safety and precautions in Carpentry Shop.

Unit-6

Smithy Shop

5 hrs

Introduction to Smithy Shop; Forging Tools and Equipment; Forging Operations: Drawing, Upsetting, Swaging, Punching, Drifting, Fullering, Bending; Hot Working Processes: Rolling, Drop Forging, Press Forging, Hot Extrusion, Hot Drawing, Cold Working Process, Safety and Precautions in Smithy Shop.

Test/ Reference:-

1. Hajra Choudhury S.K., Hajra Choudhury A.K. And Nirjhar Roy S.K., "Elements Of Workshop Technology", Vol. I 2008 And Vol. II 2010, Media Promoters And Publishers Private Limited, Mumbai.
2. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering And Technology", 4th Edition, Pearson Education India Edition, 2002.
3. Gowri P. Hariharan And A. Suresh Babu, "Manufacturing Technology – I" Pearson Education, 2008.
4. Roy A. Lindberg, "Processes And Materials Of Manufacture", 4th Edition, Prentice Hall India, 1998.
5. Rao P.N., "Manufacturing Technology", Vol. I And Vol. II, Tata Mcgrawhill House, 2017.

Course Code-100112P

**Workshop Practices Lab
Perform all Experiments**

0 0 2 1

List of Practical:

1. Learn and apply of different fitting tools –like work holding, marking, measuring, cutting, finishing and miscellaneous. Student will also prepare the report with sketch, specifications and applications of fitting tools demonstrated.
2. Prepare one simple and another male-female type fitting jobs as per given drawings- 2 jobs
3. Learn and apply of different tin smithy tools. Student will also prepare the report with sketch, specifications and applications of tin smithy tools demonstrated.
4. Learn and apply of welding equipments and making minimum one model.
5. Learn and apply of foundry tools and making minimum one model.
6. Learn and apply of carpentry tools and making minimum one model.
7. Learn and apply of Sheet Metal tools and making minimum one model.
8. Learn and apply of Lathe Tools & operations for making a job.
9. Learn and apply the application of measuring tools.
10. Learn and apply any casting process for making a model



Group B 1st & 2nd Sem (SESSION 2024-2025)

Course Code-100209

Basic Electronics

3 0 0 3

Unit- 1.0

Semiconductor diode

9 hrs

Intrinsic and extrinsic types, energy band in intrinsic and extrinsic Semiconductor, equilibrium carrier concentration Direct and indirect band-gap semiconductor. Ideal diode Construction, p-n junction under open circuit, drift, and diffusion current, built in potential, forward bias, and reverse bias condition. Effect of temperature, static and dynamic resistance, breakdown mechanism in diode, Junction capacitance. Zener diode Working, VI characteristics Light emitting Diode, Photodiode, Solar cell.

Unit- 2.0

Diode Applications

7 hrs

Half wave rectifiers, Full wave rectifiers & Rectifier with filters, Zener diode application as voltage regulator, Clipping and Clamping circuits, Voltage doubler (includes numerical on rectifier, filter, and Zener regulator)

Unit- 3.0

Bipolar Junction Transistor

8 hrs

BJT introduction: Construction, Symbol, and types (PNP and NPN), working of BJT, BJT configuration and characteristics, Load line analysis, Operating point, Need for Biasing, different Biasing circuits, Bias stability. BJT as a switch & Amplifier, low frequency small signal model of BJT, CE amplifier with and without feedback

Unit- 4.0

Field Effect Transistor

6hrs

General characteristics of FET; Comparison between FET & BJT; JFET: Construction, Principle of Operation, Shockley equation. Output and transfer characteristics; Depletion & Enhancement Type MOSFET: Construction, Principle of operation. Output and transfer characteristics;

Unit- 5.0

Operational Amplifier

6 hrs

Block diagram of an Operational amplifier, schematic symbol, characteristics of an ideal and practical operational amplifier, concept of virtual ground, Inverting and non-inverting amplifier, voltage follower, adder, subtractor, integrator and differentiator.

Unit- 6.0

Fundamental of Digital Electronics

6 hrs

Introduction to number system: octal, Hexadecimal, Binary numbers, Binary addition using 1's and 2's complement method. logic gates, Universal gates, Boolean Algebra, De Morgan's theorems, Simplification, and realization of Boolean expression using basic gates and NAND gates.

Test/ Reference:-

1. Electronic Device & Circuit theory Boylestad and Nashelsky Pearson
2. Electronic Principles Albert Malvino & Davis J. Bates TMH
3. Digital logic and computer design M. Morris Mano PHI
4. Electronic Devices and Circuit David A Bell Oxford
5. Microelectronic Circuit: Theory and Application Sedra and Smith Oxford

Course Code-100209P Basic Electronics Lab

0 0 2 1

Perform any 10 Experiments

1. Study of Cathode Ray Oscilloscope (CRO) (a) Measurement of amplitude, time period and frequency of unknown continuous signals.
2. Identification of active and passive component.
3. Study the characteristics of P-N junction diode under (a) Forward bias, and (b) Reverse bias.
4. Study of clipping circuits and clamping circuits.
5. To recognize a half -wave rectifier and full-wave rectifier using sinusoidal voltage.
6. Study of Full wave rectifier using Capacitor filter.
7. To recognize voltage regulator using Zener diode.
8. Study of the input and output characterization of common base (CB) bipolar junction transistor.
9. Study the input and output characterization of common emitter (CE) bipolar junction transistor.
10. Study the output and transfer characteristics of JFET (Junction field effect transistor)
11. Study of operational amplifier as (i) Inverting (ii) Non-inverting amplifier.
12. Study of operational amplifier as (i) Integrator (ii) Differentiator.
13. Construction and verification of all other gate (AND, OR, NOT, XOR) using only a) NOR gate b) only NAND gate.

Group B 1st & 2nd Sem (SESSION 2024-2025)

Unit- 1.0

PC HARDWARE(6 lectures):

Identification of the peripherals of a computer, components in a CPU and its functions. Block diagram of the CPU along with the configuration of each peripheral. Functions of Motherboard. Assembling and Disassembling of PC. Installation of OS. Basic Linux commands.

Unit- 2.0

INTERNET(4 lectures)

Web Browsers, Access of websites, Surfing the Web, Search Engines, Customization of web browsers, proxy settings, bookmarks, search toolbars, pop-up blockers. Antivirus types, Protection from various threats.

Unit- 3.0

MICROSOFT WORD(4 lectures)

Overview of MS word features. Usage of Hyperlink, Symbols, Spell Check, Track Changes. Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word. Using Word to create Project Certificate, Project Abstract, News Letter, Resume.

Unit- 4.0

LaTeX(6 lectures)

Word Orientation: Overview of LaTeX and tool word: Importance of LaTeX and MS office or equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Using LaTeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX.

Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Unit- 5.0

MICROSOFT EXCEL(4 lectures)

Overview of Excel Features Excel formulae & Functions, conditional formatting, Charts, Hyper linking, Renaming and Inserting worksheets, Data Analysis functions. Creating a Scheduler (Features: - Gridlines, Format Cells, Summation, auto fill, Formatting) Calculating GPA (Features: - Cell Referencing, Formulae and functions in excel.

Unit- 6.0

MICROSOFT POWER POINT(4 lectures)

Overview of PowerPoint features, Insertion of images, slide transition, Custom animation, Hyperlinks.

Test/ Reference:-

1. The Complete Computer upgrade and repair book, Cheryl A Schmidt, 3rd edition, WILEY Dream tech
2. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
3. PC Hardware – A, Handbook – Kate J., Chase PHI
4. LaTeX Beginner's Guide, Stefan Kottwitz, Packt Publishing

Group B 1st & 2nd Sem (SESSION 2024-2025)

Unit- 1: PC Hardware

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Different types of printer.

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

Unit 2:

Task 1: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task 2: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva.

Task 3: Different commands of DOS and Linux.

Unit- 3: Internet & World Wide Web

Task1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

Unit- 4.0: LaTeX

Task 1 – Word Orientation: The mentor needs to give an overview of LaTeX and tool word: Importance of LaTeX and MS office or equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using LaTeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Unit- 5.0 :

Excel Orientation: The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that

Group B 1st & 2nd Sem (SESSION 2024-2025)

would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

Task 2 : Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

Unit- 6.0 :

Powerpoint:

Task 1: Students will be working on basic power point utilities and tools which help them create basic powerpoint presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts. Task 3: Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

Group B 1st & 2nd Sem (SESSION 2024-2025)

Module 1: Input and Output

6 Hrs

Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type() Function and Is Operator, Dynamic and Strongly Typed Language

Module 2: Control Flow statements, Function and Loops

6 Hrs

Control Flow Statements, The if Decision Control Flow Statement, The if...else Decision Control Flow Statement, The if...elseif...else Decision Control Statement, Nested if Statement, Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, The while Loop, The for Loop, The continue and break Statements.

Module 3: Strings

3 Hrs

Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings.

Module 4 : Lists

3 Hrs

Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, The del Statement.

Module 5: Dictionaries, Tuples and Sets

5 Hrs

Creating Dictionary, Accessing and Modifying key value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, The del Statement, Tuples and Sets, Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Tuple Methods, Using zip() Function, Sets, Set Methods, Traversing of Sets, Frozen set.

Module 6: Files

5Hrs

Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules.

Test/ Reference:-

1. Introduction to Python Programming, Gowrishankar S, Veena A ,1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372
2. Python Data Science Handbook: Essential Tools for Working with Data, Jake VanderPlas, 1st Edition, O'Reilly Media, 2016. ISBN-13: 978-1491912058
3. Core Python Applications Programming, Wesley J Chun, 3rd Edition, Pearson Education India, 2015. ISBN-13: 978-9332555365
4. Python Programming A Modular Approach, SheetalTaneja, Pearson Publications
5. Programming and Problem Solving with Python, Ashok NamdevKamathane and Amit Ashok Kamathane Tata McGraw Hill Education (India) Private Limited

Group B 1st & 2nd Sem (SESSION 2024-2025)**L-T-P: 0-0-2****Credit: 1****List of Experiments-**

S.No.	Name of program
Input and Output	
1	Write a program to demonstrate different number data types in Python.
2	Write a program to perform different Arithmetic Operations on numbers in Python.
3	Write a program to create, concatenate and print a string and accessing sub-string from a given string.
4	Create a variable "number" and assign an Integer to the number. Check the assigned Integer is "Positive" or "Negative".
5	Write a program to find the largest element among three Numbers.
6	Write a program to print the sum of all the even numbers in the range 1 - 50 and print the even sum.
7	Write a Program to display all prime numbers within an interval of 20 and 50.
Variables and Functions	
8	Write a program to swap two numbers without using a temporary variable.
9	Write a program to define a function with multiple return values.
10	Write a python program to find factorial of a number using Recursion.
11	Write a python script to print the current date in the following format "WED 09 02:26:23 IST 2020".
12	Write a Python program to convert temperatures to and from Celsius, Fahrenheit [Formula: $c/5 = f-32/9$].
13	Write a Python script that prints prime numbers less than 20.
Loops and Conditionals	
14	Write a program to print the following patterns using loop: * ** *** ****
15	Write a program to print multiplication tables of 8, 15, 69.
16	Write a program to check whether the given input is digit or lowercase character or uppercase character or a special character (use 'if-else-if' ladder).
17	Write a python Program to print the Fibonacci sequence using while loop.
Strings	
18	Write a program to find the length of the string without using any library functions.
19	Write a program to check if two strings are anagrams or not.
20	Write a program to check if the substring is present in a given string or not. (use regular expressions)
Lists	
21	Write a program to perform the given operations on a list: i. add ii. Insert iii. slicing
22	Write a program to perform any 5 built-in functions by taking any list.
23	Write a program to get a list of the even numbers from a given list of numbers.(use only comprehensions).
24	Write a program to implement round robin.
	Note: This routine to take a variable number of sequences and return elements from them in round robin till each sequence is exhausted. If one of the input sequences is infinite, this is also infinite. e.g. if input is [1,2,3], (4,5) -> yield 1,4,2,5,3 one after the other. Use exception control and comprehensions to write elegant code. Hint: This requires you to understand variable arguments, lists, list copy, comprehensions, iterators, generators, exception handling, control flow etc.

Group B 1st & 2nd Sem (SESSION 2024-2025)

Tuples	
25	Write a program to create tuples (name, age, address, college) for at least two members and concatenate the tuples and print the concatenated tuples.
26	Write a program to return the top 'n' most frequently occurring chars and their respective counts. e.g. aaaaabbbbcccc, 2 should return [(a 5) (b 4)]
Sets	
27	Write a program to count the number of vowels in a string (No control flow allowed).
28	Write a program that displays which letters are present in both strings.
29	Write a program to sort given list of strings in the order of their vowel counts.
Dictionaries	
30	Write a program to generate a dictionary that contains numbers (between 1 and n) in the form of (x, x*x).
31	Write a program to check if a given key exists in a dictionary or not.
32	Write a program to add a new key-value pair to an existing dictionary.
33	Write a program to sum all the items in a given dictionary.
Files	
34	Write a program to sort words in a file and put them in another file. The output file should have only lower case words, so any upper case words from source must be lowered. (Handle exceptions)
35	Write a program to find the most frequent words in a text. (read from a text file).

Additional Programs:

1. Write a program to check whether a given number has an even number of 1's in its binary representation (No control flow allowed).
2. Write a program to implement user defined map() function.
3. Write a program to return a list in which duplicates are removed and the items are sorted from a given input list of strings.
4. Write a program to implement left binary search.
5. Write a program to change days to hours, hours to minutes and minutes to seconds using currying of composition of functions.
6. Write a program to generate an infinite number of even numbers (Use generator)
7. Write a program to convert a given iterable into a list. (Using iterator)
8. Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.

TextBooks:

1. Y. Daniel Liang, Introduction to programming using Python, 1st Edition, Pearson Publications, 2017.
2. Sheetal Taneja, Python Programming A Modular Approach ,1st Edition Pearson Publications, 2017.
3. Brett Slatkin (C), Effective Python: 59 Specific Ways to Write Better Python, I/C, 1st Edition Pearson Publications, 2015.

Group B 1st & 2nd Sem (SESSION 2024-2025)

4. Ashok Namdev Kamathane and Amit Ashok Kamathane, Programming and Problem Solving with Python , 1st Edition, McGraw Hill Education (India) Private Limited, 2017.

REFERENCE BOOKS:

1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Python Programming A Modular Approach with Graphics, Database, Mobile, and Web Applications, Sheetal Taneja, Naveen Kumar, Pearson
3. Programming with Python, A User's Book, Michael Dawson, Cengage Learning, India Edition
4. Think Python, Allen Downey, Green Tea Press
5. Core Python Programming, W. Chun, Pearson
6. Introduction to Python, Kenneth A. Lambert, Cengage



Course Code-100219

Introduction to Web Designing

3 0 0 3

Unit- 1.0

Fundamentals of Internet and Web Technologies Lecture [5] Web Basics and Overview: Introduction to Internet, World Wide Web, History of the web, Website, Homepage, Domain Name, Web Browsers and Web server, Web Server Working, Client-Server Architecture, 3-Tier Web Architecture, Web hosting, URL, MIME, HTTP protocol, Web Programmers Toolbox.

Unit- 2.0

Introduction to HTML: Elements and Structure Lecture [7] Introduction to html: Fundamentals of HTML elements, History of HTML, Document body, Different tags, sections, text, heading, paragraphs, hyperlink, lists, tables, color coding and images, Div and Span Tags for grouping, character entities, URL Encoding, frames, and frame sets.

Unit - 3.0

HTML Forms and Multimedia Integration Lecture [5] HTML form, Form Elements, Form Attributes, HTML canvas, embedding audio and video in a webpage, HTML Vs XHTML.

Unit- 4.0

Introduction to CSS: Styling and Layouts Lecture [8] Need for CSS, introduction to CSS, basic syntax and structure, External Style Sheets, Internal Style Sheets, Inline Style, CSS Selectors, div & span tag, CSS Color, CSS Backgrounds, Borders, Margins, Padding. Box Model, Height/width, outline, Text, Font, Tables, CSS Buttons, CSS Display, CSS Float & Clear, CSS Overflow.

Unit- 5.0

JavaScript Basics: Scripting and Control Lecture [8] JavaScript: [Introduction to Client-side Scripting, what can JavaScript Do, Need of JavaScript, Enhancing HTML Documents with JavaScript; the Building Blocks: Data types, variables, Types of Operators, Operator Precedence, Type conversion; Conditional statement in JavaScript: if else, and else if, Switch statement; Loops in JavaScript: for, while, do/while, break, continue.

Unit- 6.0

Advanced JavaScript: Objects and Events Lecture [9] Advanced JavaScript: Objects in JavaScript (array, number, string, Boolean); event handling (e.g., onclick, onsubmit); error handling: JavaScript scope; responsive modal forms; form validation.

Test/ Reference:-

1. Beginning Web Programming with HTML, XHTML, and CSS., Jon Duckett, Publisher(s): WROX ISBN:9780470259313
2. JavaScript: The Definitive Guide, 6th Edition, David Flanagan, Publisher(s): O'Reilly Media, Inc. ISBN: 978059680552
3. Internet & World Wide Web: How to Program, Fourth Edition, H. M. Deitel- Deitel & Associates, Inc., P. J. Deitel - Deitel & Associates, Inc, Publisher(s): Pearson ISBN: 97801336085645
4. Internet and Web Technologies, Kamal Raj, Publisher: McGraw Hill Education India ISBN: 9780070472969, 9180070472969

1. Design a home page which displays information about your college department using heading, HTML entities and paragraphs. Implement different types of list tags in the college department home page. Create a webpage for any clinic using marquee and HTML formatting tags. Create an image(s) and iframe in a webpage.
2. Create a Hyperlink in home page connecting it to 3 different pages. Design a webpage using HTML that includes an image map, and embeds audio and video. Design a time-table and display it in a tabular format. iv. Design an admission form for any course in your college with text, password fields, drop-down list, check-boxes, radio button, submit, and reset button.
3. Design a static webpage using HTML to co-2, co-3 create a frameset with header, navigation, and content sections. Create a webpage with a frameset divided into 3 frames: 20% on the left for page contents, 60% in the center for the main body, and 20% on the right for remarks. Create a web page multiple types of style sheet used in a single page
4. Create a catalogue for an online shopping company that sells electronic items using CSS. Design a webpage of your hometown with an attractive background color, text font, and an image using inline CSS formatting Create a student web form for entering student information. Design a library webpage using different CSS border styles and the CSS box model.
5. Write a JavaScript program: Find the largest among three numbers. Calculate the factorial of a number. Check whether a given number is an Armstrong number. Find the sum of natural numbers using recursion. v. Check whether a string is a palindrome. Convert a decimal number to binary.
6. Write a JavaScript program: To design a scientific calculator with event handling for each button. To compute the squares and cubes of numbers from 0 to 10, and display the results in an HTML table format.
7. Write JavaScript to validate the following fields of the registration page: Name: Must contain only alphabets and be at least 6 characters long. Password: Must be at least 6 characters long. E-mail ID: Must follow the standard pattern name@domain.com and not contain invalid characters. Phone Number: Must contain exactly 10 digits

Course Code-100114

Basic Electronics Engineering

3 0 0 3

Unit- 1.0

Semiconductor diode

9 hrs

Intrinsic and extrinsic types, energy band in intrinsic and extrinsic Semiconductor, equilibrium carrier concentration Direct and indirect band-gap semiconductor. Ideal diode Construction, p-n junction under open circuit, drift, and diffusion current, built in potential, forward bias, and reverse bias condition. Effect of temperature, static and dynamic resistance, breakdown mechanism in diode, Junction capacitance. Zener diode Working, VI characteristics Light emitting Diode, Photodiode, Solar cell.

Unit- 2.0

Diode Applications

7 hrs

Half wave rectifiers, Full wave rectifiers & Rectifier with filters, Zener diode application as voltage regulator, Clipping and Clamping circuits, Voltage doubler (includes numerical on rectifier, filter, and Zener regulator)

Unit- 3.0

Bipolar Junction Transistor

8 hrs

BJT introduction: Construction, Symbol, and types (PNP and NPN), working of BJT, BJT configuration and characteristics, Load line analysis, Operating point, Need for Biasing, different Biasing circuits, Bias stability. BJT as a switch & Amplifier, low frequency small signal model of BJT, CE amplifier with and without feedback

Unit- 4.0

Field Effect Transistor

6hrs

General characteristics of FET; Comparison between FET & BJT; JFET: Construction, Principle of Operation, Shockley equation. Output and transfer characteristics; Depletion & Enhancement Type MOSFET: Construction, Principle of operation. Output and transfer characteristics;

Unit- 5.0

Operational Amplifier

6 hrs

Block diagram of an Operational amplifier, schematic symbol, characteristics of an ideal and practical operational amplifier, concept of virtual ground, Inverting and non-inverting amplifier, voltage follower, adder, subtractor, integrator and differentiator.

Unit- 6.0

Fundamental of Digital Electronics

6 hrs

Introduction to number system: octal, Hexadecimal, Binary numbers, Binary addition using 1's and 2's complement method. logic gates, Universal gates, Boolean Algebra, De Morgan's theorems, Simplification, and realization of Boolean expression using basic gates and NAND gates.

Test/ Reference:-

6. Electronic Device & Circuit theory Boylestad and Nashelsky Pearson
7. Electronic Principles Albert Malvino & Davis J. Bates TMH
8. Digital logic and computer design M. Morris Mano PHI
9. Electronic Devices and Circuit David A Bell Oxford
10. Microelectronic Circuit: Theory and Application Sedra and Smith Oxford

Course Code-100114P Basic Electronics Engineering Lab 0 0 2 1
Perform any 10 Experiments

14. Study of Cathode Ray Oscilloscope (CRO) (a) Measurement of amplitude, time period and frequency of unknown continuous signals.
15. Identification of active and passive component.
16. Study the characteristics of P-N junction diode under (a) Forward bias, and (b) Reverse bias.
17. Study of clipping circuits and clamping circuits.
18. To recognize a half -wave rectifier and full-wave rectifier using sinusoidal voltage.
19. Study of Full wave rectifier using Capacitor filter.
20. To recognize voltage regulator using Zener diode.
21. Study of the input and output characterization of common base (CB) bipolar junction transistor.
22. Study the input and output characterization of common emitter (CE) bipolar junction transistor.
23. Study the output and transfer characteristics of JFET (Junction field effect transistor)
24. Study of operational amplifier as (i) Inverting (ii) Non-inverting amplifier.
25. Study of operational amplifier as (i) Integrator (ii) Differentiator.
26. Construction and verification of all other gate (AND, OR, NOT, XOR) using only a) NOR gate b) only NAND gate.

