Shirpur Education Society's

R. C. Patel Institute of Technology, Shirpur

(An Autonomous Institute)

Course Structure

First Year B.Tech (All Branches)

with efffect from Year 2020-21

Shahada Road, Near Nimzari Naka, Shirpur, Maharashtra 425405
Ph: 02563 259 802, Web: www.rcpit.ac.in

Semester-I												
Sr	Course Category	Course Code	Course Title	Teaching Scheme			Evaluation Scheme (CA)				ESE	Total	Credit
				L	T	P	TA	Term Test 1 (TT1)	Term Test 2 (TT2)	Average (TT1 & TT2)			
							[A]			[B]	[C]	[A+B+C]	
1	BS	BSFY1010T	Engineering Mathematics-I	4	1		20	15	15	15	65	100	5
2	BS	BSFY1020T	Engineering Physics-I	2			20	15	15	15	65	100	2
3	BS	BSFY1030T	Engineering Chemistry-I	2			20	15	15	15	65	100	2
4	ES	ESFY1040T	Engineering Mechanics	3	1		20	15	15	15	65	100	4
5	ES	ESFY1050T	Basic Electrical Electronics Engineering	3			20	15	15	15	65	100	3
6	BS	BSFY1020L	Engineering Science-I Laboratory			2	25				25	50	1
8	ES	ESFY1040L	Engineering Mechanics Laboratory			2	25				25	50	1
9	ES	ESFY1050L	Basic Electrical Electronics Engineering Laboratory			2	25				25	50	1
10	HM	HMFY1060L	Language Proficiency- English			2	25				25	50	1
12	ES	ESFY1070L	Workshop @			2	50					50	1@
			Total	14	2	8	200			75	425	700	20
@ For Computer Engineering, Data Science, Electrical Engineering ; Credit to be given at the end of the same academic year.													

Semester-II													
Sr	Course Category	Course Code	Course Title	Teaching Scheme			Evaluation Scheme (CA)				ESE	Total	Credit
				L	T	P	TA	Term Test 1 (TT1)	Term Test 2 (TT2)	Average (TT1 & TT2)			
							[A]			[B]	[C]	[A+B+C]	
1	BS	BSFY2010T	Engineering Mathematics-II	4	1		20	15	15	15	65	100	5
2	BS	BSFY2020T	Engineering Physics-II	2			20	15	15	15	65	100	2
3	BS	BSFY2030T	Engineering Chemistry-II	2			20	15	15	15	65	100	2
4	ES	ESFY2040T	Engineering Graphics	2			20	15	15	15	65	100	2
5	ES	ESFY2050T	Computer Programming	3			20	15	15	15	65	100	3
6	HM	HMFY2060T	Effective Communication Skill	2			20	15	15	15	65	100	2
7	BS	BSFY2020L	Engineering Science -II Laboratory			2	25				25	50	1
9	ES	ESFY2040L	Engineering Graphics Laboratory			2	25				25	50	1
10	ES	ESFY2050L	Computer Programming Laboratory			2	25				25	50	1
11	HM	HMFY2060L	Effective Communication Skills Laboratory			2	25				25	50	1
12	ES	ESFY2070L	Workshop @			2	50					50	1
			Total	15	1	10	270			90	490	850	21
@ For Electronics and Telecommunication Engineering, Civil Engineering, Mechanical Engineering.													

Engineering Mathematics - I (BSFY1010T)

Teaching Scheme	**Examination Scheme**
Lectures : 04 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : 01 Hr/week	End Sem Exam : 65 Marks
Credit : 05	Total Marks : 100 Marks

Course Objectives

1. To develop the basic Mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. The topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology.
2. To provide hands on experience using SCILAB software to handle real life problems.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Apply principles of basic operations of matrices, rank and echelon form of matrices to solve simultaneous	L3	Apply
CO2	Illustrate the basic concepts of Complex numbers.	L3	Apply
CO3	Apply the knowledge of complex numbers to solve problems in hyperbolic functions and logarithmic function.	L3	Apply
CO4	Illustrate the basic principles of Partial differentiation	L3	Apply
CO5	Illustrate the knowledge of Maxima, Minima and Successive differentiation	L3	Apply
CO6	Illustrate SCILAB programming techniques to the solution of linear and simultaneous algebraic equations	L3	Apply

Course Contents

Unit-I Matrices 09 Hrs.

Prerequisite: *Inverse of a matrix, addition, multiplication and transpose of a matrix*

Types of Matrices (Symmetric, Skew Symmetric, Hermitian, Skew Hermitian, Unitary,Orthogonal Matrices and properties of Matrices), Rank of a matrix using Echelon forms, reduction to normal form and PAQ form, System of homogeneous and non homogeneous equations, their consistency and solutions, Linear dependent and independent vectors, Application of inverse of a matrix to coding theory.

Unit-II Complex Numbers 07 Hrs.

Prerequisite: *Definition, algebra, polar and exponential form of complex numbers*

Statement of D'Moivre's Theorem, Expansion of $\sin^n\theta$, $\cos^n\theta$ in terms of sines and cosines of multiples of θ and Expansion of $\sin n\theta$, $\cos n\theta$ in powers of $\sin\theta$, and $\cos\theta$, Powers and Roots of complex number.

Unit-III Hyperbolic function and Logarithm of Complex Numbers 06 Hrs

Prerequisite: *Trigonometric functions,logarithm of real number*

Circular functions of complex number and Hyperbolic functions, Inverse Circular and Inverse Hyperbolic functions, Separation of real and imaginary parts of all types of functions, Logarithmic Functions, Separation of real and Imaginary parts of Logarithmic Functions.

Unit-IV Successive differentiation and Partial Differentiation 12 Hrs

Prerequisite: *Limit, Derivative*

Successive differentiation: n^{th} derivative of standard functions, Leibnitzs theorem (without proof) and problems

Partial Differentiation: Function of several variables, Partial derivatives of first and higher order, Differentiation of composite function, Total differentials, implicit functions, Euler's Theorem on Homogeneous functions with two and three independent variables (with proof), Deductions from Euler's theorem.

Unit-V Applications of Partial Differentiation and Expansion of Function 12 Hrs.

Prerequisite: *Maxima and Minima of single variable function, Partial derivatives*

Maxima and Minima of a function of two independent variables, Lagrange's method of undetermined

multipliers with one constraint, Jacobian's of two and three independent variables, Taylor's Theorem (Statement only) and Taylor's series, Maclaurin's series (Statement only), Expansion of standard functions, Indeterminate forms, L-Hospital Rule, problems involving series.

Unit-VI Numerical Solutions of Transcendental Equations and System of Linear Equations 06 Hrs.

Prerequisite: *Solution of system of equations*

Solution of Transcendental Equations: Solution by (i) Newton Raphson Method, (ii) Regula Falsi Method.

Solution of system of linear algebraic equations by (i) Gauss Jacobi Iteration Method, (ii) Gauss Seidal Iteration Method, (iii) Gauss Elimination Method, (iv) Gauss Jordan Method.

Reference Books

1. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Eastern Limited, 9th Ed.
2. Applied Numerical Methods with MATLAB for Engineers and Scientists, Steven Chapra, Mc-Graw Hill.
3. Advanced Engineering Mathematics, Dennis G. Zill, Warren S. Wright,CBS Publishers, New Delhi.
4. Linear Algebra, Hadly G, Narosa Publication
5. Matrix and Linear Algebra : aided with Matlab, Datta Kanti Bhushan, PHI,New Delhi.

Text Books

1. Higher Engineering Mathematics, Dr. B. S. Grewal, Khanna Publication.
2. Advanced Engineering Mathematics, H. K. Dass, 28th edition, S. Chand 2010.
3. Engineering Mathematics,Ravish Singh, Mukul Bhatt, TMH New Delhi.

Engineering Physics - I (BSFY1020T)

Teaching Scheme	**Examination Scheme**
Lectures : 02 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : - - - -	End Sem Exam : 65 Marks
Credit : 02	Total Marks : 100 Marks

Course Objectives

1. To Identify and understand the fundamental physical principles underlying engineering technologiesa prerequisite to become successful engineer.
2. To provide inclusive knowledge of fundamental physical principles encouraging engineering students to venture in research field.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Comprehend the concepts of solid state physics and apply them in designing solid state devices	L2,L3	Understand Apply
CO2	Relate the scope and foundation of quantum mechanics and its role in development of modern technology.	L3,L4,L5	Apply, Analyze, Evaluate
CO3	Assimilate the wide scope of Nanotechnology in modern developments and its role in emerging innovative applications	L2,L3	Understand Apply
CO4	Employ the concepts of optics in precision measurements	L1,L2	Remember Understand

Course Contents

Unit-I Solid State Physics 08 Hrs.

Prerequisite: *Crystal Physics (Unit cell, Space lattice, Crystal structure, Simple Cubic, Body Centered Cubic, Face Centered Cubic, Production of X-rays, Intrinsic and extrinsic semiconductors, Energy bands in conductors, semiconductors and insulators, Semiconductor diode, I-V characteristics in forward and reverse bias*

Introduction

Miller indices; Interplanar spacing

X-ray diffraction and Braggs law; Determination of Crystal structure using Braggs spectrometer

Direct & indirect band gap semiconductor; Fermi level; Fermi dirac distribution; Fermi energy level in intrinsic & extrinsic semiconductors; effect of impurity concentration and temperature on fermi level; mobility, current density; Hall Effect; Fermi Level diagram for p-n junction (unbiased, forward bias, reverse bias)

Semiconductor devices: LED, Zener diode as a voltage regulator, Solar cell.

Unit-II Quantam Physics 07 Hrs.

Prerequisite: *Dual nature of radiation, Photoelectric effect, Matter waves-wave nature of particles, de-Broglie relation, Davisson-Germer experiment*

Introduction

De Broglie hypothesis of matter waves; properties of matter waves

Wave packet, phase velocity and group velocity

Heisenberg uncertainty principle; Single slit electron diffraction experiment; nonexistence of electron in nucleus

Schrodingers time dependent wave equation; time independent wave equation; Particle trapped in one dimensional infinite potential well

Fundamentals of Quantum Computing.

Unit-III Nanoscience & Nanotechnology 06 Hrs.

Prerequisite: *Scattering of electrons, Tunnelling effect, Electrostatic focusing, magneto static focussing*

Introduction

Dimensional classification of Nanomaterials

Properties of Nanomaterials

Synthesis of Nanomaterials

Properties of carbon allotropes (CNT, Fullerenes, Graphene)

Applications of Nanotechnology

Characterization techniques: Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), Atomic Force Microscope (AFM), Scanning Tunnelling Microscope (STM)

Unit-IV Optics-I 06 Hrs

Prerequisite: *Wave front and Huygen's principle, reflection and refraction, Interference by division of wave front, Youngs double slit experiment*

Interference by division of amplitude, Stokes Relation

Interference in thin film of constant thickness due to reflected and transmitted light; origin of colours in thin film

Interference in Wedge shaped film

Formation of Newtons rings

Applications of interference - Determination of thickness of very thin wire or foil;determination of refractive index of liquid; wavelength of incident light; radius of curvature of lens; testing of surface flatness; Anti-reflecting and Highly reflecting films.

Reference Books

1. Fundamentals of optics by Jenkins and White, McGrawHill
2. Solid State Electronic Devices- B. G. Streetman, Prentice Hall Publisher
3. Concepts of Modern Physics- Arther Beiser, Tata McGraw Hill
4. Introduction to Solid State Physics- C. Kittel, John Wiley & Sons publisher
5. Advances in Nano Materials And Applications: History of Nanotechnology From Pre-Historic to Modern Times, Madhuri Sharon, Wiley, USA

Text Books

1. A text book of Engineering Physics-Avadhanulu & Kshirsagar, S. Chand
2. A Text Book of Engineering Physics, S. O. Pillai, New Age International Publishers.
3. textbook of Optics - N. Subramanyam and Brijlal, S.Chand
4. Modern Engineering Physics Vasudeva, S.Chand
5. Engineering Physics R K Gaur & S L Gupta, Dhanpat Rai Publications
6. Engineering Physics Shatendra Sharma & Jyotsna Sharma, Pearson publications
7. Engineering Physics D. K. Bhattacharya & Poonam Tandon, Oxford publications
8. Engineering Physics V Rajendran, McGraw Hill Educations
9. Nano: The essentials, understanding Nanoscience and Nanotechnology, T. Pradeep, Tata Mc Graw Hill, 2007

Engineering Chemistry - I (BSFY1030T)

Teaching Scheme	**Examination Scheme**
Lectures : 02 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : - - - -	End Sem Exam : 65 Marks
Credit : 02	Total Marks : 100 Marks

Course Objectives

1. To obtain a strong hold on basic concepts of Chemistry that form fundamental principles of technology.
2. To give exposure to recent development in the course related topics.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Analyze microscopic chemistry in terms of atomic and molecular orbitals and aromaticity of organic molecules.	L3	Apply
CO2	Rationalize various phase transformation using thermodynamics.	L2,L5	Understand, Evaluate
CO3	Apply the knowledge of polymers, fabrication methods, conducting polymers in various industrial fields.	L3	Apply
CO4	Analyze the quality of water and suggest suitable methods of treatment.	L3,L4	Apply, Analyse

Course Contents

Unit-I Atomic and Molecular Structure 06 Hrs.

Prerequisite: *Basics theories of Atomic and Molecular structures, Shapes of orbitals, Bonding.*

Atomic orbitals (s,p,d,f) orbital shapes, Electronic Configuration.

Molecular orbital theory (MOT), bonding and anti-bonding orbitals.

Molecular orbital diagrams of Homonuclear and Heteronuclear diatomic molecules- H2, Li2, Be2, O2, CO, NO, their bond order and magnetic properties.

Aromaticity, Huckels rule.

Structure and bonding of benzene and pyrrole.

Unit-II Intermolecular Forces and Phase Rule 06 Hrs.

Prerequisite: *Diplole moment,Types of Intermolecular forces,Phases*

Ionic, dipolar, Hydrogen bonding and Vander Waals interactions.

Phase Rule-Gibbs Phase Rule, Terms involved with examples.

One Component System (Water).

Reduced Phase Rule, Two Component System (Pb- Ag).

Advantages and Limitations of Phase Rule.

Numerical based on Phase rule.

Unit-III Polymers 07 Hrs.

Prerequisite: *Molecular weight, Monomer, Free radical, Chain reaction, Catalyst, Types of Reactions.*

Introduction: Definition- Polymer, polymerization, classification.

Molecular weight (Number average and Weight average), Numerical problems on molecular weight.

Effect of heat on polymers (glass transition temperature), Viscoelasticity.Classification-Thermoplastic and Thermosetting polymers.

Compounding of plastic, Fabrication of plastic by Compression, Injection, Transfer and Extrusion moulding.

Preparation, properties and uses of PMMA, Kevlar, Phenol-Formaldehyde, Urea Formaldehyde.

Conducting Polymers.Polymers in medicine and surgery.

Unit-IV Water 7 Hrs

Prerequisite: *Proeprties of Water, Chemical Composition, Sources, Types of Impurities.*

Introduction - Impurities in water.

Hardness of water- units (no conversions), types and numerical problems.

Determination of hardness of water by EDTA method and numerical problems.

Softening of water by Ion Exchange process and numerical problems.

BOD, COD- definition, significance and Numerical problems.

Water purification-membrane technology- Electrodialysis, Reverse osmosis, and Ultra filtration.

Sewage treatment by activated sludge process.

Reference Books

1. Engineering Chemistry - Wiley India (ISBN 9788126519880)
2. A Text Book of Engineering Chemistry - Shashi Chawla (DhanpatRai).
3. Concise Inorganic Chemistry - J D LEE.
4. Essentials of Physical Chemistry - B S Bahl, Arun Bahl, G D Tuli.

Text Books

1. Engineering Chemistry - Jain & Jain (DhanpatRai).
2. Engineering Chemistry - Dara & Dara (S Chand).

Engineering Mechanics (ESFY1040T)

Teaching Scheme	**Examination Scheme**
Lectures : 03 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : 01 Hr/week	End Sem Exam : 65 Marks
Credit : 04	Total Marks : 100 Marks

Course Objectives

1. To acquaint the concept of equilibrium
2. To study and analyze motion of moving particles/bodies

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Illustrate the effect of force and moment and apply the same along with the concept of equilibrium systems with the help of FBD.	L1, L2	Learn, Remember
CO2	Demonstrate the understanding of Centroid and its significance and locate the same	L3	Understand
CO3	Correlate real life application to specific type of friction and estimate required force to overcome friction	L4	Analyze
CO4	Establish relation between velocity and acceleration of a particle and analyze the motion by plotting the relation	L4,L5	Analyze, Evaluate
CO5	Analyze general plane motion of rigid bodies using Instantaneous centre	L4	Analyze
CO6	Analyze particles in motion using force and acceleration, work-energy and impulse-momentum principles	L4	Analyze

Course Contents

Unit-I System of Coplanar Forces & Centroid 09 Hrs.

Prerequisite: *Physics from 12th*

System of Coplanar Forces: Classification of force systems, Principle of transmissibility, composition and resolution of forces. Resultant of coplanar force system (Concurrent forces, parallel forces and nonconcurrent Non-parallel system of forces). Moment of force about a point, Couples, Varignons Theorem. Force couple system.

Centroid: First moment of Area, Centroid of composite plane Laminas.

Unit-II Equilibrium of System of Coplanar Forces, Beams 08 Hrs.

Prerequisite: *Physics from 12th*

Equilibrium of System of Coplanar Forces: Conditions of equilibrium for concurrent forces, parallel forces and non-concurrent non-parallel general forces and Couples. Equilibrium of rigid bodies-free body diagrams.

Equilibrium of Beams: Types of beams, simple and compound beams, type of supports and reaction: Determination of reactions at supports for various types of loads on beams. (Excluding problems on internal hinges).

Unit-III Friction 05 Hrs.

Prerequisite: *Physics from 12th*

Friction: Revision of Static Friction, Dynamic/ Kinetic Friction, Coefficient of Friction, Angle of Friction, Laws of friction. Concept of Cone of friction. Equilibrium of bodies on inclined plane. Application to problems involving wedges and ladders.

Unit-IV Kinematics of Particle & Rigid Body 09 Hrs.

Prerequisite: *Physics from 12th.*

Kinematics of Particle: Rectilinear motion. Motion curves (a-t, v-t, s-t curves). Motion along plane curved path. Tangential & Normal component of acceleration.

Kinematics of Rigid Body: Translation, Rotation and General Plane motion of Rigid body.

The concept of Instantaneous center of rotation (ICR) for the velocity. Velocity analysis of rigid body using ICR.

Unit-V Kinetics of Particle 08 Hrs.

Prerequisite: *Physics from 12th.*

Kinetics of a Particle: Force and Acceleration: DAlemberts Principle, concept of Inertia force, Equations of dynamic equilibrium, Newtons second law of motion. (Analysis limited to simple rectilinear

systems only).

Kinetics of a Particle: Work and Energy: Work Energy principle for a particle in motion. Application of Work Energy principle to a system consisting of connected masses and Springs.

Kinetics of a Particle: Impulse and Momentum: Principle of linear impulse and momentum. Impact and collision: Law of conservation of momentum, Coefficient of Restitution. Direct Central Impact and Oblique Central Impact. Loss of Kinetic Energy in collision of inelastic bodies.

Reference Books

1. F.P. Beer and E.R. Johnson, Mechanics for Engineers, McGraw Hill Education (India),5th Edition. ISBN-10: 0077687302
2. R.C. Hibbeler, Engineering Mechanics- Statics and Dynamics, 11 th Edition, Mc Millan Publication, New Delhi. ISBN 978-81-317-2699-0
3. Timoshenko and Young, Engineering Mechanics, McGraw Hill Co. Ltd.
4. F.L. Singer, Engineering Mechanics, Harper and Row Publishers, USA
5. J.L.Meriam and L.G. Kraige, Engineering Mechanics, Vol.1 and Vol. 2, Wiley Publication

Text Books

1. A.K. Tayal, Engineering Mechanics, Umesh Publications. ISBN 978-93-80117-38-6
2. S. Ramamrutham, Engineering Mechanics, Dhanpat Rai Publication, New Edition, New Delhi
3. S.S.Bhavikatti, Engineering Mechanics, New Age International Publications, 4th Edition. ISBN 81 -224-0671-3

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (ESFY1050T)

Teaching Scheme	**Examination Scheme**
Lectures : 03 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : - - - -	End Sem Exam : 65 Marks
Credit : 03	Total Marks : 100 Marks

Course Objectives

1. To implement the fundamentals of DC circuits and apply knowledge for analysing network theorems in DC circuits.
2. To analyze single phase as well as three phase AC circuits.
3. To analyze the performance of single phase transformer and three phase systems
4. To study the characteristics of basic PN diode and implement the basic circuits like rectifiers, clippers and clampers using PN diode.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Analysis DC and AC Electric circuits.	L4	Analyse
CO2	Explaining the basic principles of single phase and three phase Circuits.	L2	Understand
CO3	Differentiating an understanding of basic concepts of R,L,C,circuits.	L4	Analyse
CO4	Analysis the star nad delta connection with its application.	L4	Analyse
CO5	Explaining the basic principles of Diode , Rectifier ,Clipper Clamper	L2	Understand

Course Contents

Unit-I DC Circuits 08 Hrs.

Prerequisite: *Concepts of charge, current and voltage*

: Introduction to ideal and practical voltage and current sources, Kirchhoffs current and voltage laws, Mesh and Nodal analysis, Supernode and Supermesh analysis, Introduction to dependent sources and examples using Mesh and Nodal analysis.

Unit-II DC Network Theorems 06 Hrs.

Prerequisite: *Concept of Electrical circuit*

Source transformation and star delta connections,Thevenins Theorem and Nortons Theorem, Superposition Theorem and Maximum Power Transfer Theorem.

Unit-III AC Circuits 12 Hrs.

Prerequisite: *Concepts of electrical circuit elements (R, L and C).*

Generation and representation of alternating voltage and currents, RMS and Average value, phasor representation, AC through resistance, inductance and capacitance, R-L , R-C and R-L-C series and parallel circuits, phasor diagrams. Analysis of real power, reactive power, apparent power, power factor, Series and parallel resonance, Q-factor and bandwidth..

Unit-IV Electrical Systems 10 Hrs

Prerequisite: *Concepts of Ohms law, resistivity and series & parallel connections*

Three-phase balanced circuits, voltage and current relations in star and delta connections, Construction, working principle, emf equation, ideal and practical transformer, transformer on no load and on load, phasor diagrams, equivalent circuit, regulation and efficiency.

Unit-V Electronics 06 Hrs.

Prerequisite: *Concepts of semiconductors and P-N junction.*

P-N Junction diode, application of diodes as rectifiers: half wave rectifier, full wave rectifier, bridge rectifier (resistive load), Introduction to clipper and clamper circuits using diodes. .

Reference 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. E. Hughes, Electrical and Electronics Technology, Pearson, 2010.
4. V.D. Toro, Electrical Engineering Fundamentals, Prentice Hall India, 1989

Text Books

1. Ravish Singh, Basic Electrical Engineering, Tata McGraw Hill, 2018

2. B. R. Patil, Basic Electrical Engineering, Oxford Higher Education, 2016. item R. S. Sedha, A textbook of Electronis Devices and Circuits, S. Chand, 2002

Engineering Science Laboratory -I (BSFY1020L)

Practical Scheme
Lectures : - - - - -
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. To provide hands-on experience of basic physics instruments.
2. To introduce students to the modern equipments, precision techniques and experimental methods for observing, understanding and verifying laws optics.
3. To provide students with a basic understanding of the Physics concept through experiments that may be required by engineers in the course of their careers.
4. To introduce the learners with the basics of light wave and electron conduction in semiconductor to facilitate his learning of the concepts in modern physics.
5. Remember the fundamental rules, laws and theorems of Chemistry.
6. To learn and understand the basic concepts and use of water quality parameters
7. To develop competency of synthesis and analysis.
8. Apply the knowledge of chemistry to understand the properties and applications of engineering materials.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Ability to state and verify various laws which they have studied, through experiments	L5	Evaluation
CO2	Ability to calculate the Miller Indices of cubical crystal structure and numerous parameters of film by interference experiment	L3	Application
CO3	Ability to measure the band gap and IV characteristics of semiconductor diodes	L5	Evaluation
CO4	Measure molecular/system properties such as chloride con- tent, hardness of water, dissolved oxygen, etc.	L4,L5	Analysis, Evaluation
CO5	Synthesize a small polymer molecule.	L6	Create
CO6	Measure molecular/system properties of water such BOD, COD by instrumental methods	L2	Understand

List of Laboratory Experiments

Grpup-I

Perform any 5 experiments from the following list of experiments

1. Determination of radius of curvature of a lens using Newtons ring set up.
2. Determination of wavelength of monochromatic light by using Newtons ring set up.
3. Study of Miller Indices.
4. Study of Cubical crystal structure.
5. Determination of energy band gap of semiconductor.
6. Study of Zener diode as voltage regulator.
7. Study of I/V characteristics of LED
8. Study of I / V characteristics of semiconductor diode

Grpup-II

Perform any 5 experiments from the following list of experiments

1. To determine chloride content of water by Mohr's method.
2. To determine total, temporary and permanent hardness of water sample by EDTA method.
3. To determine pH of different solutions using pH meter.
4. Determination of percent of Zn/Cu in brass.
5. Molecular weight determination of polymers by Oswald Viscometer.
6. Synthesis of UF, PF, Nylon 66.
7. Determination of COD.
8. Determination of surface tension of a given liquid at room temperature using Stalgmometer by drop number method.

Any other experiment based on syllabus may be included, which would help the learner to understand topic/concept.

Reference Books

1. B.Sc Practical Physics: Harnam Singh, Hemne P.S, S Chand Publication.
2. Fundamentals of Physics: Halliday and Resnick, 10th ed, Wiley, 2013.

3. Engineering Chemistry Lab Manual by Shuchi Tiwari (2010), SCITECH Publications.

4. Vogels Text Book of Quantitative Chemical Analysis, 6th Edition by G. J. Jeffery, J. Bassett, Mendham, R.C. Denney, Longman Scientific & Technical Publications, New York.

5. A Text Book of Engineering Chemistry by R. N. Goyal and H. Goel, Ane Books (P) Ltd. (2009).

6. A Text Book on experiments and calculations Engineering by S.S. Dara, S. Chand & Company Ltd. (2003).

7. Instrumental methods of Chemical Analysis, Gurudeep R, Chatwal Sham, K. Anand, Latest Edition (2015), Himalaya Publications.

Text Books

1. Practical Engineering Chemistry by K.Mukkanti, etal. B.S.Publications, Hyderabad (2011).

2. Lab Manual on Engineering Chemistry by Sudharani, Dhanpat Rai Publications, Co., New Delhi, (2009).

Engineering Mechanics Laboratory (ESFY1040L)

Practical Scheme
Lectures : - - - - -
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Semester Examination : 25 Marks
Total : 50 Marks

Course Objectives

1. To study basic laws of engineering mechanics & its applications to solve the problems.
2. To introduce concept of centroid through actual models.
3. To introduce concept of friction and to find co-efficent of friction.
4. To introduce the students to the principles and methods of statics through examples.
5. To introduce the students to the principles and methods of dynamics and to apply those fundamentals to solve the problems on dynamics.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Learn basic principles of mechanics	L1	Learning
CO2	Determine centroid of composite shapes	L5	Evaluate
CO3	Understand concept of friction and Evaluate co-efficient of friction	L3,L5	Understand, Evaluate
CO4	Determine reactions of simply supported beam	L5	Evaluate
CO5	Calculate position, velocity and acceleration of particle using principles of kinematics and kinetics	L4	Analyze

List of the Experiments

Perform any 6 experiments from the following list of experiments

1. Graphical Work-Statics (Polygon Law Of Forces ,Law Of Parallelogram, Triangle Law)
2. Problems on Beam Reaction by Graphics Statics Method
3. Centroid of Irregular Shaped Bodies
4. Determination of Support reaction for beam
5. Determination of coefficient of friction using Inclined plane
6. Verification of Lamis theorem using Jib crane
7. Verification of Law of Machine Using Screw Jack
8. Verification of Law of Machine Using Single Purchase Winch Crab
9. Study of Compound Pendulum
10. Graphical Work-Dynamics

Reference Books

1. F.P. Beer and E.R. Johnson, Mechanics for Engineers, McGraw Hill Education (India),5th Edition. ISBN-10: 0077687302
2. R.C. Hibbeler, Engineering Mechanics- Statics and Dynamics, 11 th Edition, Mc Millan Publication, New Delhi. ISBN 978-81-317-2699-0
3. Timoshenko and Young, Engineering Mechanics, McGraw Hill Co. Ltd.
4. F.L. Singer, Engineering Mechanics, Harper and Row Publishers, USA
5. J.L.Meriam and L.G. Kraige, Engineering Mechanics, Vol.1 and Vol. 2, Wiley Publication

Text Books

1. A.K. Tayal, Engineering Mechanics, Umesh Publications. ISBN 978-93-80117-38-6
2. S. Ramamrutham, Engineering Mechanics, Dhanpat Rai Publication, New Edition, New Delhi
3. S.S.Bhavikatti, Engineering Mechanics, New Age International Publications, 4th Edition. ISBN 81 -224-0671-3

Basic Electrical and Electronics Engineering Laboratory (ESFY1050L)

Practical Scheme
Lectures : - - - - -
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. To inculcate in students basic ideas and principle of electrical engineering
2. To impart knowledge of electrical circuits applicable in various field of engineering.
3. To educate the students about Electrical circuit
4. To enhance knowledge of R-L-C Circuit.
5. To inculcate the basic knoweldge of Rectifier, Clipper & Clapper.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Implementing and Explain DC network theorems.	L3,L2	Apply, Understand
CO2	Summarizing the knowledge of 1- Φ and 3-Φ AC circuit	L2	Understand
CO3	Explaining electronic components used in lab	L2	Understand
CO4	Implementing the operating principle and output characteristics of PN junction diodes, zener diode, BJT, rectifiers	L3	Apply

List of the Experiments

Perform any 7 experiments from the following list of experiments

1. Mesh and Nodal analysis.
2. Verification of Superposition theorem
3. Verification of Thevenins Theorem
4. Verification of Nortons theorem
5. Verification of Maximum Power Transfer theorem
6. Study of R-L series and R-C series circuit.
7. R-L-C series resonance circuit.
8. R-L-C parallel resonance circuit
9. Rectifiers: HWR and FWR.
10. Clipper/clamper circuits.

Reference Books

1. D. P. Kothaii , I. J. Nagrath, Basic Electrical Engineering, Tata McGraw Hill New Delhi, 3rd edition 2009. Kothari
2. M. S. Naidu, S. Kamakshiaih, Introduction to Electrical Engineering, Tata McGraw Hill New Delhi,
3. B. L. Theraja, A. K. Theraja, Electrical Technology, Basic Electrical Engineering, Volume- I, S. Chand & Company Ltd. , New Delhi.
4. B. L. Theraja, A. K. Theraja, Electrical Technology, AC & DC Machines, Volume- II, S. Chand & Company Ltd. , New Delhi.
5. Ashfaq Husain, Electric Machines, Dhanpat Rai & Co.
6. K. A. Krishnamurty, M. R. Raghuveer, Electrical and Electronics Engineering for Scientists and Engineers, Willey Eastern Limited.

Language Proficiency- English (HMFY1060L)

Practical Scheme
Lectures : - - - - -
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. To enhance their English Vocabulary.
2. To construct grammatically sound and meaningful sentences for effective communication.
3. To be effective listener and reader.
4. To use English with appropriate accent.
5. To make the student proficient English speaker.

CO1	Students will be able to use apt vocabulary with its proper application as per the context.	L1,L2	Remember, Understand
CO2	Students will analyse the various sentence structures and will implement effective in formal communication.	L3,L4	Apply, Analyse
CO3	Students will differentiate the various realizations of the English sounds and will utter accordingly	L3	Apply
CO4	Students will Listen, speak, read and write effectively in business correspondence.	L3	Apply
CO5	Students will be able to overcome inhibitions by active participate in GD, Debate, presentations etc.	L3	Apply

Course Contents

Unit-I Introduction to English as a Language 5 Hrs.

Prerequisite: *Signs, Symbols, Basics of English*

Introduction and Definitions of Language, Features and Functions of Language, Growth and Development of English, English as World Language for Business, English as a Second Language (ESL)

Unit-II English Vocabulary 4 Hrs.

Prerequisite: *Reading of Dictionary, Glossary.*

The Concept of Word Formation & Various Techniques, Acquaintance with Prefixes and suffixes in English to form Derivatives, Synonyms, Antonyms, One Word Substitute and Standard Abbreviations, Formal and Informal Vocabulary, Root words from Foreign Languages and their use in English, Use of Thesaurus for Contextual Expertise.

Unit-III Application of English Grammar 7 Hrs.

Prerequisite: *High school English Grammar.*

Sentence Structures, Parts of Speech, Tenses, Voice, Degree, Positive & Negative Sentences, Framing Questions.

Unit-IV Phonetics 5 Hrs.

Prerequisite: *Alphabets, Oral Communication, Speech and sounds.*

Introduction to phonetics, Study of Speech Organs, Study of Phonemic Script: Consonants, Vowels & Clusters, Articulation of Different Sounds in English.

Unit-V Think and Express in English 5 Hrs.

Prerequisite: *Positive Attitude, Active Participation.*

Inhibitions & Embarrassment for ESL Learners, Ways to overcome Shyness as a ESL User, ESL Speaking Activities and Games, Ways to Study English Outside the Classroom.

List of Assignments

1) Functions of Language: 01

2) Word Formation: 01

3) Use of Thesaurus: 01

4) Application of Grammar: 01

5) Phonetics: 02

6) Presentation Skills: 02

Reference Books

1. Wren & Martin, Highschool English Grammar & Composition, S.Chand & Company, New Delhi.
2. Z.N.Patil, B.S.Valke, Ashok Thorat, Zeenat Merchant, English for Practical Purposes, Macmillan India Ltd.
3. R.K. Bansal, J.B Harrison, Spoken English A manual of Speech and Phonetics, Orient Blackswan
4. Thomas N. Huckin & Leslie A. Olsen, Technical Writing & Professional Communication for non-native speakers of English,McGraw Hill.
5. CIEFL, Hyderabad, Exercises in Spoken English. Parts. I-III, Oxford University Press.
6. Raymond Murphy, Essential English Grammar, CUP (2016).
7. Raymond Murphy, Intermediate English Grammar, CUP (2016).
8. Raman, Meenakshi & Sangeetha Sharma, Technical Communication: Principles and Practice, Oxford University Press, New Delhi, 2015

Workshop Practice (ESFY1070L/ESFY2070L)

Practical Scheme
Lectures : - - - - -
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Continuous Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. Get oriented to an engineering workshop environment and will learn to conduct oneself adhering to the safety norms and set procedures.
2. Get familiarized with various methods of commonly used fabrication techniques and the type of hand tools required to perform such of these techniques.
3. Prepare simple jobs like joints, component of simple shape etc. as per component drawings with reasonable degree of tolerance.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	To explain the concepts of industrial safety and the importance of working safely	L2	Explain
CO2	To interpret basic engineering blueprints	L2,L3	Understand Apply
CO3	To understand the use of hand tools in fabrication processes	L2	Understand
CO4	To understand various fabrication processes and machine protocols.	L1,L2	Remember Understand
CO5	To provide hands-on experience on basic machine tools	L2,L3	Understand Apply

Course Contents

Unit-I Fitting Shop 14 Hrs.

Use and setting of fitting tools for chipping, cutting, filing, marking, center punching, drilling, tapping.

Unit-II Carpentry 14 Hrs.

Use and setting of hand tools like hacksaws, jack planes, chisels and gauges for construction of various joints, wood turning and modern wood turning methods.

Unit-III Welding 06 Hrs.

Edge preparation for welding jobs. Arc welding for different job like, Lap welding of two plates, butt welding of plates with simple cover, arc welding to join plates at right angles

Unit-IV Sheet Metal Practice 06 Hrs

Introduction to primary technology processes involving bending, punching and drawing various sheet metal joints, development of joints.

Unit-V Plumbing 06 Hrs.

Use of plumbing tools, spanners, wrenches, threading dies, demonstration of preparation of a domestic line involving fixing of a water tap and use of coupling, elbow, tee, and union etc.

Unit-VI PCB 06 Hrs.

Layout drawing: Positive and negative, PCB etching and drilling, Tinning and soldering technique.

List of Laboratory Experiments:

1. To study various types fitting tools and make a V-fitting/T-fitting from the given two M.S pieces.
2. To study various types of carpentry tools and prepare half-lap joint or T-lap joint.
3. To study various welding techniques and make a V-butt or Lap-joint, using the given mild steel pieces by arc welding
4. To study various types of sheet metal tools and make square or rectangular tray.
5. To study plumbing tools and joints, and make one job containing various pipe fitting.
6. To make printed circuit board as per the given drawing.

Any other experiment based on syllabus may be included, which would help the learner to understand topic/concept.

Reference Books

1. Manufacturing Processes and Systems,9th Edition, P.F.Ostwald, John Willy & Sons INC. UK, 2008
2. Electrical Workshop: Safety, Commissioning, maintenance and testing of electrical equipment, 3rd Edition, R.P. Singh, IK International Publishing House Pvt. Ltd. 2012

Text Books

1. Mechanical Workshop Practice, 2nd Edition, K.C. John, PHI Learning Pvt.Ltd.2014.
2. Manufacturing Technology-Vol I, 4th Edition, P.N. Rao, Tata McGraw Hill, 2014.
3. Printed Circuit Boards: Design, Fabrication, assembly and testing, 1st Edition, R.S. Khandpur, Tata McGraw Hill, 2005

Engineering Mathematics - II (BSFY2010T)

Teaching Scheme	**Examination Scheme**
Lectures : 04 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : 01 Hr/week	End Sem Exam : 65 Marks
Credit : 05	Total Marks : 100 Marks

Course Objectives

1. The course is aimed to develop the basic Mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. The topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology.
2. To provide hands on experience in using SCILAB software to handle real life problems.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Illustrate the concepts of Beta and Gamma function, DUIS and rectification	L3	Apply
CO2	Apply the concepts of Double integral	L3	Apply
CO3	Apply the concept of Triple integral	L3	Apply
CO4	Solve various types of First Order differential equation	L3	Apply
CO5	Solve various types of Higher Order Differential equation	L3	Apply
CO6	Apply the principles of Numerical Method for solving differential equation and numerical integration analytically and using SCILAB also	L3	Apply

Course Contents

Unit-I Beta and Gamma Function, Differentiation under Integral sign and Rectification 10 Hrs.

Prerequisite: *Derivative,Integration*

Beta and Gamma functions and its properties.

Differentiation under integral sign with constant limits of integration.

Tracing of curves Cardioid, Strophoid, Bernoullis Lemniscate, Astroid, Cycloid, 3D Solids Sphere, Cone, Cylinder, Paraboloid.

Rectification of plane curves in Cartesian form.

Rectification of curve in Parametric and Polar forms.

Unit-II Double Integration 10 Hrs.

Prerequisite: *Integration*

Double Integration Introduction, Evaluation of Double Integrals. (Cartesian & Polar).

Evaluation of double integrals by changing the order of integration.

Evaluation of integrals over the given region. (Cartesian & Polar).

Evaluation of double integrals by changing to polar coordinates.

Application of double integrals to compute Area and Mass.

Unit-III Triple Integration 06 Hrs.

Prerequisite: *Unit-II*

Triple integration - Introduction and evaluation of integral using Cartesian co ordinate system.

Problems of triple integration using cylindrical and spherical polar coordinates

Application of triple integral to compute volume.

Unit-IV Differential Equations of First Order and First Degree 09 Hrs

Prerequisite: *Differential Equation,Variable separable form*

Exact differential Equations, Equations reducible to exact form by using integrating factors.

Linear differential equations (Review), equation reducible to linear form, Bernoulli's equation.

Simple application of differential equation of first order and first degree to Engineering problem.

Unit-V Linear Differential Equations with Constant Coefficients and Variable Coefficients of Higher Order 10 Hrs.

Prerequisite: *Solution of Differential equation,Roots of quadratic and Cubic equation*

Linear Differential Equation with constant coefficient complementary function, particular integrals of

differential equation of the type $f(D)y = X$ where X is $e^{ax}, \sin(ax+b), \cos(ax+b), e^{ax}V, xV$.

Method of variation of parameters.

Cauchys homogeneous linear differential equation and Legendre's differential equation

Applications of Higher order differential equation.

Unit-VI Numerical solution of ordinary differential equations of first order and first degree, and, Numerical Integration 08 Hrs.

Prerequisite: *Solution of Differential Equation*

Numerical solution of ordinary differential equation using (a) Euler's method (b) Modified Euler method, (c) Runge Kutta method of order four (d) Taylor series method.

Numerical integration by (a) Trapezoidal rule (b) Simpson's $1/3^{rd}$ rule (c) Simpson's $3/8^{th}$ rule (all without proof).

Reference Books

1. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley Eastern Limited, 9th Ed.
2. Applied Numerical Methods with MATLAB for Engineers and Scientists by Steven Chapra, McGraw Hill.
3. Dennis G. Zill, A First Course in Differential Equations with Modelling Applications.
4. Thomas & Finney, Calculus & Analytic Geometry, 9th edition, Addison Wesley.
5. Dennis G. Zill, Warren S. Wright, Advanced Engineering Mathematics.

Text Books

1. Higher Engineering Mathematics, Dr. B. S. Grewal, Khanna Publication
2. Advanced Engineering Mathematics by H. K. Dass, 28th edition, S. Chand 2010.
3. Engineering Mathematics,Ravish Singh, Mukul Bhatt, TMH New Delhi.

Engineering Physics - II (BSFY2020T)

Teaching Scheme	**Examination Scheme**
Lectures : 02 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : - - - -	End Sem Exam : 65 Marks
Credit : 02	Total Marks : 100 Marks

Course Objectives

1. To obtain a strong hold on basic concepts of Physics that form fundamental principles of technology that prepare students to tackle complex problems faced by society.
2. To provide inclusive knowledge of fundamental physical principles encouraging engineering students to venture in research field

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Apply the foundations of Optics and Photonics in development of modern communication technology	L3	Apply
CO2	Relate the basics of Electrodynamics which are prerequisite for signal communications, Antenna Theory etc.	L4	Apply Analyze
CO3	Comprehend the essential properties of engineering materials for their current and futuristic frontier applications.	L2	Understand
CO4	Interpret and explore basic sensing techniques for physical measurements in modern instrumentation.	L2	Understand

Course Contents

Unit-I Optics-II 08 Hrs.

Prerequisite: *Wave front and Huygen's principle, reflection and refraction, diffraction, comparison of Fresnel diffraction and Fraunhoffer diffraction, Absorption, recombination, energy bands of p-n junction, refractive index of a material, Snells law, Total internal reflection*

Diffraction: Fraunhoffer diffraction at single slit, Diffraction Grating, Absent spectra,Resolving power of a grating; Applications of diffraction grating; Determination of wavelength of light using plane transmission grating.

Laser: Spontaneous emission and Stimulated emission; Metastable state, Population inversion, Types of pumping, Resonant cavity, Einsteinss equations; Helium Neon laser;Nd:YAG laser; Semiconductor laser,

Applications of laser- Holography.

Fibre optics: Structure of optical fibre, Types of optical fibres: Glass fibres, Plastic fibres,Plastic clad silica fibres, Single mode & Multimode, Step index & Graded index, Numerical Aperture for step index fibre.

Unit-II Engineering Materials and Applications 07 Hrs.

Prerequisite: *Electrical resistivity and conductivity, Temperature dependence of resistance, Magnetic materials, Crystal physics, Dielectrics and electric polarisation, capacitors and capacitance*

Superconductors: Superconductivity, Critical temperature, Critical magnetic field, BCS theory, Meissners effect, Type I and Type II and high Tc superconductors

De Broglie hypothesis of matter waves; properties of matter waves

Metallic glasses: Principle, Properties & Applications

Shape Memory Alloys: Principle, Properties & Applications

Non-linear materials: Principle, Properties & Applications

Unit-III Electrodynamics 06 Hrs.

Prerequisite: *Coulomb's law-force between two point charges, Electric field, electric field due to a point charge, electric field due to a dipole, Gauss's law, Faradays law, Cartesian co-ordinate system, Cylindrical co-ordinate system, Spherical co-ordinate system*

Scalar and Vector field, Physical significance of gradient, curl and divergence in Cartesian co-ordinate system

Gausss law for electrostatics, Gausss law for magnetostatics, Faradays Law and Amperes circuital law, Divergence theorem, Stokes theorem

Maxwells equations (Free space and time varying fields), Plane electromagnetic wave equation in free space, Physical significance and Applications of Maxwells equations.

Unit-IV Physics of Sensors 05 Hrs

Prerequisite: *Transducer concept, meaning of calibration, piezoelectric effect*

Pressure sensor: Concept of pressure sensing, Capacitive and piezoresistive pressure sensors.

Piezoelectric transducers: Concept of piezoelectricity, use of piezoelectric transducer as ultrasonic generator and application of ultrasonic transducer for distance measurement.

Optical sensor: Photodiode, construction and use of photodiode as ambient light measurement and flux measurement, Pyroelectric sensors

Reference Books

1. Fundamentals of optics by Jenkins and White, McGrawHill
2. Introduction to Electrodynamics- D. J. Griffiths, Pearson publication
3. Concepts of Modern Physics- Arther Beiser, Tata McGraw Hill
4. Instrumentation & Measurement Techniques by Albert D. Helfrick & William D. Cooper (PHI) Edition
5. Handbook of Modern Sensors Physics design and application- Jacob Fraden, Springer, AIP press.

Text Books

1. A text book of Engineering Physics-Avadhanulu & Kshirsagar, S. Chand
2. A Text Book of Engineering Physics, S. O. Pillai, New Age International Publishers.
3. textbook of Optics - N. Subramanyam and Brijlal, S.Chand
4. Optics - Ajay Ghatak, Tata Mc Graw Hill
5. Engineering Physics R K Gaur & S L Gupta, Dhanpat Rai Publications
6. Engineering Physics Shatendra Sharma & Jyotsna Sharma, Pearson publications
7. Engineering Physics D. K. Bhattacharya & Poonam Tandon, Oxford publications
8. Engineering Physics V Rajendran, McGraw Hill Educations
9. Electronic Instrumentation H.S. Kalsi, Tata Mc Graw-Hill Education

Engineering Chemistry-II (BSFY2030T)

Teaching Scheme	**Examination Scheme**
Lectures : 02 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : - - - -	End Sem Exam : 65 Marks
Credit : 02	Total Marks : 100 Marks

Course Objectives

1. To obtain a strong hold on basic concepts of Chemistry that form fundamental principles of technology.
2. To give exposure to recent development in the course related topics.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques	L4	Analyse
CO2	Identify different types of corrosion and suggest control measures in industries	L4,L3	Analyse, Apply
CO3	Illustrate the principles of green chemistry and study environmental impact	L2,L5	Understand Evaluate
CO4	Analyze the quality of fuel and quantify the oxygen required for combustion of fuel	L3,L4, L5	Apply, Analyse, Evaluate

Course Contents

Unit-I Spectroscopic Techniques and Applications: 05 Hrs.

Prerequisite: *Properties of light and spectrum, wavelength and wave number.*

Introduction: Definition, electromagnetic radiation (Numerical). Electromagnetic spectrum.

Principle of spectroscopy, Classification of spectroscopy, Types of spectroscopy.

Flame Photometry: Principle, Instrumentation, working, Applications, interferences, advantages and disadvantages.

Jablonski diagram, Introduction to florescence and phosphorescence, application of fluorescence in medicine only.

Unit-II Electrochemistry and Corrosion: 08 Hrs.

Prerequisite: *Basic electrochemical process- Elctolysis, Elctrochemical.*

Introduction- Concept of electrode potential and standard electrode potential, electrochemical and galvanic series, Nernst equation (Numerical).

Mechanism of Corrosion:

(I) Dry or Chemical Corrosion:

i) Due to oxygen ii) Due to other gases.

(II) Wet or Electrochemical corrosion: Mechanism:

i) Evolution of hydrogen type ii) Absorption of oxygen.

Types of Corrosion: Galvanic cell corrosion, Concentration cell corrosion (differential aeration principle), Pitting corrosion, Intergranular corrosion, Stress corrosion.

Factors affecting the rate of corrosion:

(i) Nature of metal,

(ii) Nature of corroding environment.

Methods of corrosion control:

(I) Cathodic protection:

i) Sacrificial anodic protection

ii) Impressed current method.

(II) Metallic coatings: Hot dipping (tinning and galvanising), metal cladding, metal spraying, cementation.

(III) Organic coating: Paint.

Unit-III Green Chemistry and Synthesis of drugs : 05 Hrs.

Prerequisite: *Plloution, Benefits of green synthesis, Renewable Energy Sources.*

Introduction: Definition, significance.

Twelve Principles of Green chemistry.

Conventional and green synthesis of :

(i) Adipic acid, (ii) Indigo, (iii) Carbaryl, (iv) Benzimidazole.

Percentage atom economy (Numericals).

Green fuel: Biodiesel.

Green solvents: CO_2.

Unit-IV Fuels and Combustion 08 Hrs

Prerequisite: *Types of Fuels, General Composition , Fractional Distillation*

Introduction: Definition, classification, characteristics of a good fuel.

Calorific value: Definition, Units, Gross or Higher calorific value & Net or lower calorific value, Dulongs formula & numerical for calculations of Gross and Net calorific values.

Solid fuels: Analysis of coal- Proximate and Ultimate Analysis (theory and numericals).

Liquid fuels: Petrol- Knocking, Octane number, Cetane number, Antiknocking agents,Power alcohol.

Combustion: Calculations for requirement of only oxygen and air (by weight and by volume only) for given solid & gaseous fuels.

Reference Books

1. Green Chemistry: A textbook - V.K.Ahluwalia, Alpha Science International.
2. Fundamentals of Molecular Spectroscopy (4th Edition) - C.N.Banwell, Elaine M. McCash, Tata McGraw Hill.
3. Elementary Organic Spectroscopy- Y.R.Sharma, S.Chand and Co.
4. A Text Book of Engineering Chemistry - Shashi Chawla, Dhanpat Rai.

Text Books

1. Engineering Chemistry - Jain & Jain (DhanpatRai).
2. Engineering Chemistry - Dara & Dara (S Chand).

Engineering Graphics (ESFY2040T)

Teaching Scheme	**Examination Scheme**
Lectures : 02 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : - - - -	End Sem Exam : 65 Marks
Credit : 02	Total Marks : 100 Marks

Course Objectives

1. Students should be able to visualize the objects
2. They should be able to understand and read drawing
3. To impart and inculcate proper understanding of the theory of projection
4. They should be able to present the same

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Recognize the value of engineering graphics, as a language of engineers.	L2	Remember
CO2	Construct orthographic views of lines, and basic shapes of solids.	L3	Apply
CO3	Interpret and sketch orthographic and sectional orthographic views of various machine components	L3	Apply
CO4	Visualize objects, and draw isometric views	L4	Analyse
CO5	Build 2D Sketches using AutoCAD	L4	Analyse

Course Contents

Unit-I Introduction to Engineering Graphics & Orthographic Projections 10 Hrs.

Prerequisite: *Fundamental Knowledge of High School Geometry.*

Introduction to Engineering Graphics: Introduction to Engineering Drawing. Types of Lines, Dimensioning Systems as per IS conventions. Orthographic Projections: Different views of simple machine parts as per the first angle projection method recommended by I.S. Full Sectional views of Simple Machine parts.

**Drawing of orthographic projections using Auto CAD

**Introduction to Auto CAD: - Basic Drawing and Editing Commands. Knowledge of setting up layers, Dimensioning, Hatching, plotting and Printing.

Unit-II Isometric Views and Engineering Curves 10 Hrs.

Prerequisite: *Basic High School Geometry and principles of Orthographic Projections.*

Isometric Views: Isometric Views/Drawings of blocks (plain and cylindrical, excluding spheres).

**Drawing of Isometric Views using Auto CAD.

@ Engineering Curves: Involute of circle (problems on string only). Cycloid Plane cycloid (circle rolling in one direction only).

Unit-III Projection of Points and Lines 10 Hrs.

Prerequisite: *Principles of Orthographic Projections*

Projection of Points and Lines:-Lines inclined to both the Reference Planes. (Excluding Traces) First Quadrant only.

Unit-IV Projection of Solids 10 Hrs.

Prerequisite: *Principles of Orthographic Projections and Projection of Points, Lines.*

**Projection of Solids: - (Prism, Pyramid, Cylinder & Cone only) Projections of Solids with the axisinclined to HP and VP. (Exclude Spheres, Composite, Hollow solids and frustum). Use change of position or Auxiliary plane method

Unit-V Section of Solids and Development of Surfaces 10 Hrs.

Prerequisite: *Principles of Orthographic Projections and Projection of Solids*

@ Section of solids: - Sections of Prism, Pyramids, Cylinder & Cone, cut by plane perpendicular to at least one reference plane. (Exclude Curved Section Plane). Use change of position or Auxiliary plane method.

@ Development of Surfaces:- Lateral surface development of Prism, Pyramid, Cylinder, Cone with

section plane inclined to HP or VP only. (Exclude Reverse Development)

**** Should be covered during Auto CAD Practical.**

@ Should be covered only in Term work. (i.e. Questions will not be asked for the End Semester Examination).

Reference Books

1. K.Venugopal (2007), Engineering Drawing and Graphics + AutoCAD, New Age International Publishers.
2. M.L.Dabhade (2004), Engineering Drawing, Vision Publications
3. Dhananjay A. Jolhe Engineering Drawing with an Introduction to AutoCAD, Tata McGraw Hill Education Private Limited

Text Books

1. N.D.Bhatt , Engineering Drawing, Charotar Publishing House,
2. M.B.Shah & B.C.Rana Engineering Drawing, Pearson Education.

Computer Programming (ESFY2050T)

Teaching Scheme	**Examination Scheme**
Lectures : 03 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : - - - -	End Sem Exam : 65 Marks
Credit : 03	Total Marks : 100 Marks

Course Objectives

1. To familiarise the logic of Computer Programming.
2. To provide exposure in developing algorithm, flowchart and thereby writing efficient codes for user defined problem.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Illustrate the basic terminology used in computer programming	L2	Understand
CO2	Illustrate the concept of data types, variables and operators using C.	L2,L3	Understand, Apply
CO3	Design and Implement control statements and looping constructs in C.	L3,L6	Apply, Create
CO4	Apply function concept on problem statements.	L2,L3	Understand, Apply
CO5	Demonstrate the use of arrays, strings and structures in C.	L2,L3	Understand Apply
CO6	Demonstrate the use of pointers	L2,L3	Understand, Apply

Course Contents

Unit-I Algorithm and Flowchart 04 Hrs.

Three construct of Algorithm and flowchart: Sequence, Decision(Selection) and Repetition

Unit-II Fundamentals of C-Programming 06 Hrs.

Character Set, Identifiers and keywords, Data types, Constants, Variables.

Operators-Arithmetic, Relational and logical, Assignment, Unary, Conditional,Bitwise, Comma, other operators

Expression, statements, Library Functions, Preprocessor.

Data Input and Output getchar( ), putchar( ), scanf( ), printf( ), gets( ), puts( ), Structure of C program.

Unit-III Control Structures 08 Hrs.

Decision making with Branching - If statement, If-else Statement, Switch case statement.

Looping while , do-while, for

Nested control structure

Continue statement, Break statement, Goto statement.

Unit-IV Functions and Parameter 06 Hrs

Function -Introduction of Function, Defining a Function, Accessing a Function, Function Prototype, Passing Arguments to a Function, Recursive function

Storage Classes Auto , Extern , Static, Register

Unit-V Arrays, String, Structure 06 Hrs.

Array-Concepts, Declaration, Definition, Accessing array element, Onedimensional and Multidimensional array, Passing Arrays to Function

String- Basics of String, Functions in string.h, user defined function for string handling

Structure- Declaration, Initialization, structure within structure, Operation on structures, Array of Structure.

Unit-VI Pointers 06 Hrs.

Pointer : Introduction, Definition and uses of Pointers, Address Operator, Pointer Variables, Pointer Arithmetic

Call by value , call by Reference

Reference Books

1. Basics of Computer Science, by BehrouzForouzan , Cengage Learning.
2. Programming Techniques through C, by M. G. Venkateshmurthy, Pearson Publication.
3. Programming in ANSI C, by E. Balaguruswamy, Tata McGraw-Hill Education.
4. Programming in C, by Pradeep Day and Manas Gosh, Oxford University Press.
5. Let Us C, by YashwantKanetkar, BPB Publication.

Text Books

1. MASTERING C by K.R.Venugopal and Sudeep R.Prasad , Tata McGraw-Hill Publications.
2. A Computer Science Structure Programming Approaches using C, by Behrouz Forouzan, Cengage Learning.
3. Schaums outlines Programming with C, by Byron S. Gottfried, Tata McGraw-Hill Publications.

Effective Communication Skills (HMFY2060T)

Teaching Scheme	**Examination Scheme**
Lectures : 02 Hrs./week	Term Test : 15 Marks
Practical : - - - -	Teacher Assessment : 20 Marks
Tutorial : - - - -	End Sem Exam : 65 Marks
Credit : 02	Total Marks : 100 Marks

Course Objectives

1. To acquaint the students with appropriate language skills with the purpose of improving the existing ones LSRW
2. To make the learners understand the importance and effective use of non-verbal communication
3. To make the learner proficient in public speaking and presentation skills
4. To guide and teach the students to utilize the principles of professional business and technical writing for effective communication in the global world
5. To make the learner capable of creating official content digitally for further communication in the corporate environment

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Understand and evaluate information they listen to and express their ideas with greater clarity	L4	Evaluate
CO2	Speak and respond effectively along the various channels of communication in a business organization	L2	Understand
CO3	Speak convincingly before an audience with the help of an expanded vocabulary and enhanced digital content	L3,L5	Apply,Evaluate
CO4	Read and summarize effectively	L2	Understand
CO5	Communicate through result oriented writing both within and outside the organization.	L3,L6	Apply, Create
CO6	Write a set of effective and easy to understand technical description, instructions and convey the same using global information technology	L3,L6	Apply, Create

Course Contents

Unit-I Communication Theory 13 Hrs.

Prerequisite: *General experience and observation of everyday communication.*

Concept and Meaning, Communication cycle, Objectives, Barriers to communication (linguistic and semantic, psychological, physical, mechanical, cultural), Methods of communication (verbal and non-verbal), Networks of communication (formal and informal), Language skills (listening, speaking, reading, writing), Corporate communication: Digital Content Creation.

Unit-II Business Correspondence 05 Hrs.

Prerequisite: *Formal Communication and writing skill*

Principles of Business Correspondence, Parts of a business letter, Formats (Complete block and Modified block), Types of letters: Enquiry, Reply to enquiry, Claim, Adjustment and Sales letter.

Unit-III Grammar and Vocabulary 02 Hrs.

Prerequisite: *High School Grammar*

Grammar and Vocabulary: Common errors, Concord (subject- verb agreement), Pairs of confused words, Lexicon (Enriching vocabulary through one-word substitutes, synonyms, antonyms, etc.

Unit-IV Summarization and Comprehension 02 Hrs

Prerequisite: *Reading Skill , Vocabulary*

Passages to test the analytical skills and expression.

Unit-V Technical writing 02 Hrs.

Prerequisite: *Reading of User Manual*

Techniques to define an object, writing instructions, language exercises based on types of expositions (description of an object, explanation of a process)

Unit-VI Information Communication Technology (ICT) enabled communication media 02 Hrs.

Prerequisite: *ICT tools*

E-mail, Blog and Website.

List of assignments:

1. Communication theory: 02
2. Business Correspondence: 02
3. Grammar and vocabulary: 01
4. Summarization & Comprehension: 01
5. Technical writing: 01
6. ICT enabled communication media: 01

Reference Books

1. Communication in Organizations by Dalmar Fisher, Jaico Publishing House
2. Communication Skills by Meenakshi Raman & Sangeeta Sharma,Oxford University Press.
3. Business Correspondence & Report-writing by R.C. Sharma & Krishna Mohan, Tata McGraw-Hill Education.
4. Effective Technical Communication by Ashraf Rizvi, Tata McGraw-Hill.
5. Technical Writing & Professional Communication for non-native speakers of English by Thomas N. Huckin & Leslie A. Olsen, McGraw Hill.
6. Mastering Communication by Nicky Stanton, Palgrave Master Series
7. www.buisnesscommunicationskills.com
8. www.kcitraing.com
9. Journal of Business Communication

Engineering Science Laboratory -II (BSFY2020L)

Practical Scheme
Lectures : - - - - -
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. To provide hands-on experience of basic physics instruments.
2. To introduce students to the modern equipments, precision techniques and experimental methods for observing, understanding and verifying laws optics.
3. To provide students with a basic understanding of the Physics concept through experiments that may be required by engineers in the course of their careers.
4. To introduce the learners with the basics of diffraction and propagation of light in OFC.
5. Remember the fundamental rules, laws and theorems of Chemistry.
6. Apply the knowledge of chemistry to understand the properties and applications of engineering materials.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Ability to state and verify various laws which they have studied, through experiments	L5	Evaluation
CO2	Ability to calculate the numerous parameters of Laser and grating by diffraction experiment	L3	Application
CO3	Ability to demonstrate the propagation of light and measure basic parameters of OFC by optical fibre set up	L3, L6	Application,Evaluatio
CO4	Measure molecular/system properties such as Moisture and Ash content	L5	Evaluation
CO5	Measure molecular/system properties such as Saponification and Acid value of Oil	L2,L4	Understand Analysis
CO6	Measure molecular/system properties such as Viscosity and strength of different solutions by instrumental methods of analysis	L2,L5	Understand Evaluation

List of Laboratory Experiments

Grpup-I

Perform any 5 experiments from the following list of experiments

1. Determination of wavelength using Diffraction grating. (Hg/Na source)
2. Determination of number of lines on the grating surface using LASER Source.
3. Determination of Numerical Aperture of an optical fibre.
4. Determination of wavelength using Diffraction grating (Laser source)
5. Study of divergence of laser beam
6. Determination of width of a slit using single slit diffraction experiment (laser source)
7. Study of I-V characteristics of Photo diode.
8. Determination of velocity of ultrasonic wave in water by using ultrasonic interferometer.

Grpup-II

Perform any 5 experiments from the following list of experiments

1. Determination of Moisture content of coal.
2. Determination of Ash content of coal.
3. Saponification value of oil.
4. Acid value of oil.
5. Determination of strength of a given solution (acid / base) by using Conductometric titration.
6. Determination of Viscosity of oil by Redwood Viscometer.
7. To determine metal ion concentration using colorimeter.
8. To validate Beer-Lambert law using UV Spectrophotometer/ colorimeter.

Any other experiment based on syllabus may be included, which would help the learner to understand topic/concept.

Reference Books

1. B.Sc Practical Physics: Harnam Singh, Hemne P.S, S Chand Publication.
2. Fundamentals of Physics: Halliday and Resnick, 10th ed, Wiley, 2013.
3. Engineering Chemistry Lab Manual by Shuchi Tiwari (2010), SCITECH Publications.

4. Vogels Text Book of Quantitative Chemical Analysis, 6th Edition by G. J. Jeffery, J. Bassett, Mendham, R.C. Denney, Longman Scientific & Technical Publications, New York.

5. A Text Book of Engineering Chemistry by R. N. Goyal and H. Goel, Ane Books (P) Ltd. (2009).

6. A Text Book on experiments and calculations Engineering by S.S. Dara, S. Chand & Company Ltd. (2003).

7. Instrumental methods of Chemical Analysis, Gurudeep R, Chatwal Sham, K. Anand, Latest Edition (2015), Himalaya Publications.

Text Books

1. Practical Engineering Chemistry by K.Mukkanti, etal. B.S.Publications, Hyderabad (2011).

2. Lab Manual on Engineering Chemistry by Sudharani, Dhanpat Rai Publications, Co., New Delhi, (2009).

Engineering Graphics Lab (ESFY2040L)

Practical Scheme
Lectures : - - - - -
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. Students should be able to visualize the objects.
2. They should be able to understand and read drawing.
3. To impart and inculcate proper understanding of the theory of projection
4. They should be able to present the same

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Recognize the value of engineering graphics, as a language of engineers	L2	Remember
CO2	Construct orthographic views of lines, and basic shapes of solids	L3	Apply
CO3	Interpret and sketch orthographic and sectional orthographic views of various machine components	L3	Apply
CO4	Visualize objects, and draw isometric views	L4	Analyse
CO5	Build 2D sketches using Auto CAD	L4	Create

List of Practical /Experiments/Assignments:

Laboratory: (Term work)

Component 1

1. Orthographic projections. (03 problems)
2. Sectional Orthographic projections. (02 problems)
3. Isometric Views. (02 problems)
4. Projection of solids. (02 problems)
5. Section of solids and Development of lateral surfaces. (02 problems)
6. Projection of lines and Engineering Curves. (04 problems)

Component 2

Assignment on A-3 size sketch book/ sheet (minimum 2 problems on each topic):

1. Orthographic/Sectional Orthographic projections.
2. Isometric Projections.
3. Engineering Curves.
4. Projection of lines.
5. Projection of solids.
6. Section of solids and Development of lateral surfaces.

Component 3

AutoCAD Printouts of each from:

1. Orthographic Projections 2 problems.
2. Orthographic Projections with section 2 problems.
3. Isometric Views 2 problems.
4. Projection of solids (Prism and Pyramid only) - 2 problems.

The distribution of marks for term work shall be as follows: Laboratory work (Sheets, Assignment and AutoCAD Printouts): **25 Marks**

The final certification and acceptance of term work will be subject to satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the term work.

Reference Books

1. N. D. Bhatt, Engineering Drawing, Charotar Publishing House.
2. M.L.Dabhade (2004), Engineering Drawing, Vision Publications.
3. Dhananjay A. Jolhe Engineering Drawing with an Introduction to AutoCAD, Tata McGraw Hill Education Private Limited

Text Books

1. N.D.Bhatt , Engineering Drawing, Charotar Publishing House,

2. M.B.Shah & B.C.Rana Engineering Drawing, Pearson Education.

Computer Programming Laboratory (ESFY2050L)

Practical Scheme	**Examination Scheme**
Lectures : - - - - -	Teacher Assessment : 25 Marks
Practical : 02 Hrs./week	End Sem Exam : 25 Marks
Credit : 01	Total : 50 Marks

Course Objectives

1. To understand problem solving, problem solving aspects, programming and to know about various program design tools.
2. To acquaint with data types, input output statements, control structures, functions etc.
3. Use of procedure oriented programming approach for problem solving.
4. Develop modular code using function, recursion and iteration.
5. Build the program using pointers, self-referential pointers.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Develop algorithms for mathematical and scientific problems	L6	Create
CO2	Explore alternate algorithmic approaches to problem solving	L2	Understand
CO3	Develop modular programs using control structures,iteration and recursion	L6	Create
CO4	To synthesize a complete program using divide and conquer approach using function	L4	Analyze
CO5	To solve real world problems using procedure oriented features by writing programs	L3	Apply

List of Laboratory Experiments

1. To calculate simple interest taking principal, rate of interest and number of years as input from user.Write algorithm & Draw flowchart for the same.
2. Write a program to find greatest of three numbers using conditional operator. Write algorithm & Draw flowchart for the same.
3. Write a program to check if the year entered is leap year or not. Write algorithm & Draw flowchart for the same.
4. Write a program to calculate roots of a quadratic equation
5. Write a menu driven program to perform add / subtract / multiply / divide based on the users choice. The user will indicate the operation to be performed using the signs i.e. + for addition, - for subtraction and so on. Write algorithm & Draw flowchart for the same.
6. Write a program to find the sum of seven terms using a for loop for the following series: 1/1!+2/2!+3/3!+..+7/7!
7. Write a program to read a number, reverse the number and display the sum of digits of number
8. Write a program (using 'for' loop) to display the following asking the user for the number of lines. Write algorithm & Draw flowchart for the same.

   A

   ABA

   ABCBA

   ABCDCBA

   ABCDEDCBA

9. Write a program to check if the entered number is Armstrong or not. Write algorithm & Draw flowchart for the same.
10. Write a program to display first n elements of Fibonacci series (using 'for')
11. Write a program to find nCr using function. Write algorithm & Draw flowchart for the same.
12. Write a program which will accept n and r and calculate nCr=n!/r!(n-r)! using recursive functions
13. Write a program to initialize an automatic and static variable and increment it in the function. Call this function thrice and print the value of the variable every time after incrementing
14. Write a program to implement bubble sorting algorithm for sorting numbers in ascending order Write algorithm & Draw flowchart for the same

15. Write a program to check whether string is palindrome or not.

16. Write a program to count blank spaces, digits, vowels and consonants in the string.

17. Write a program to multiply two matrices using a function.

18. Define a structure called cricket that will describe the following information player name, country name best score, batting average. Develop a program that will store information of 25 cricket players around the world using this structure. Also display names of these cricketers in descending order with respect to their batting average.

19. Write a program to swap two numbers using a function. Pass the values to be swapped to this function using call-by-value method and call-by-reference method.

20. Write a program to accept a set of 10 numbers and print the number using pointer

Effective Communication Skills Laboratory (HMFY2060L)

Practical Scheme
Lectures : - - - - -
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. To enable the students to prepare and present themself with own introduction.
2. To enable the students to participate in oral communication activities.
3. To enable the students to express their thoughts and knowledge on various platforms.
4. To enable the students to appear for interviews and debates with confidence and readiness.
5. To enable the students to write and develop ideas to create effective and meaningful office draft.

CO1	Students will be able to describe and illustrate themselves.	L2, L3	Understand, Apply
CO2	Students will be able to use digital resources for effective presentations.	L3	Apply
CO3	Students will participate in public speaking activities as GD, Debate etc.	L3	Apply
CO4	Students will be able to prepare their resume and other office drafts.	L6	Create
CO5	Students will learn to think creatively and vividly while developing an idea.	L6	Create

List of Laboratory Experiments

Perform any 8 experiments from each group of the following list of experiments /Practicals

1. Self-Introduction
2. Practice of Group Discussion
3. Presentation Skills
4. Interview techniques
5. Elocution
6. Debate
7. Mock Interview
8. Writing Business Documents
9. Writing Job Application with Resume
10. Development of an Idea

Reference Books

1. Subroto Bagchi, The Professional: Defining the New Standard of Excellence at Work, Penguin Books Pvt.Ltd, 2011.
2. Nicky Stanton, Mastering Communication, Palgrave Master Series.
3. R.C. Sharma & Krishna Mohan, Business Correspondence & Report-writing, Tata McGraw-Hill Education.
4. Thomas N. Huckin & Leslie A. Olsen, Technical Writing & Professional Communication for non-native speakers of English, McGraw Hill.
5. Raman, Meenakshi & Sangeetha Sharma, Technical Communication: Principles and Practice, Oxford University Press, New Delhi, 2015.