RADHA GOVIND UNIVERSITY

CHANDAUSI, SAMBHAL

Faculty of Engineering & Technology

Evaluation Scheme & Syllabus for

Common for All Engineering Diploma Courses

(I Semester & II Semester)

1ST YEAR

(Effective from session _____)

Curriculum of First and Second Semester for the following Engineering Branches

Sr. No.	Name of Diploma Programme	Duration
1	Diploma in Mechanical Engineering	3Years
2	Diploma in Civil Engineering	3Years
3	Diploma in Electrical Engineering	3Years
4	Diploma in Electronics and Communication Engineering	3Years
5	Diploma in Electronics and Instrumentation	3Years
6	Diploma in Computer Science Engineering	3Years
7	Diploma in Chemical Engineering	3Years

STUDY AND EVALUATION SCHEME FOR ALL ENGINEERING AND TECHNOLOGY BRANCHES

First Semester

Subject Code	SUBJECT	STUDY SCHEME Periods/Week				Credits (C)	Marks in Evaluation Scheme								Total Marks of Internal & External
							Internal Assessment			External Assessment					
		L	T	P	Total	(L+T)+P =C	Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
DCOMM101	COMMUNICATION SKILLS IN ENGLISH	2	0	0	2	2	30	-	30	70	3	-	-	70	100
DAPPL 102	APPLIED MATHEMATICS-I	3	1	0	4	4	30	-	30	70	3	-	-	70	100
DAPPL 103	APPLIED PHYSICS-I	2	1	0	3	3	30	-	30	70	3	-	-	70	100
DAPPL 104	APPLIED CHEMISTRY	2	1	0	3	3	30	-	30	70	3	-	-	70	100
DENGI 105	ENGINEERING DRAWING	3	0	0	3	3	30	-	30	70	3	-	-	70	100
DCOMM106	COMMUNICATION SKILLS IN ENGLISH LAB	0	0	2	1	1	-	25	25	-	-	25	3	25	50
DAPPL107	APPLIED PHYSICS-I LAB	0	0	2	1	1	-	25	25	-	-	25	3	25	50
DAPPL108	APPLIED CHEMISTRY LAB	0	0	2	1	1	-	25	25	-	-	25	3	25	50
DGEN109	ENGINEERING WORKSHOP PRACTICE	0	0	4	2	2		25	25	-	-	25	3	25	50
TOTAL		**12**	**3**	**10**	**20**	**20**	**150**	**100**	**250**	**350**	**15**	**100**	**12**	**450**	**700**

For pass the candidate is required to obtain 40% marks in each paper and 50% marks in aggregate.

STUDY AND EVALUATION SCHEME FOR ALL ENGINEERING AND TECHNOLOGY BRANCHES

Second Semester

Subject Code	SUBJECT	STUDY SCHEME Periods/Week				Credits (C)	Marks in Evaluation Scheme								Total Marks of Internal & External
							Internal Assessment			External Assessment					
		L	T	P	Total	(L+T)+P =C	Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
DAPPL 201	APPLIED MATHEMATICS-II	3	1	0	4	2	30	-	30	70	3	-	-	70	100
DAPPL 202	APPLIED PHYSICS-II	2	1	0	3	4	30	-	30	70	3	-	-	70	100
DIIS 203	INTRODUCTION TO IT SYSTEM	2	1	0	3	3	30	-	30	70	3	-	-	70	100
DFEEE 204	FUNDAMNTALS OF ELECTRICAL & ELECTRONICS ENGINEERING	2	1	0	3	3	30	-	30	70	3	-	-	70	100
DEM 205	ENGINEERING MECHANICS	2	1	0	3	3	30	-	30	70	3	-	-	70	100
DES 206	*ENVIRONMENTAL SCIENCES	3	0	0	3	-	-	-	-	***70**	3	-	-	-	-
DAPPL 207	APPLIED PHYSICS-II LAB	0	0	2	1	1	-	25	25	-	-	25	3	25	50
DIIS 208	INTRODUCTION TO IT SYSTEM LAB	0	0	2	1	1	-	25	25	-	-	25	3	25	50
DFEEE 209	FUNDAMNTALS OF ELECTRICAL & ELECTRONICS ENGINEERING LAB	0	0	2	1	1	-	25	25	-	-	25	3	25	50
DEM 210	ENGINEERING MECHANICS LAB	0	0	2	1	1		25	25	-	-	25	3	25	50
TOTAL		**14**	**05**	**08**	**23**	**19**	**150**	**100**	**250**	**350**	**18**	**100**	**12**	**450**	**700**

For pass the candidate is required to obtain 40% marks in each paper and 50% marks in aggregate.

*Environmental Sciences will be an audit subject and non-credit. It is compulsory to pass the examination, but the marks will not be included in the division and percentage of obtained marks.

COMMUNICATION SKILLS IN ENGLISH

(DCOMM-101)

L	T	P
2	0	0

COURSE OBJECTIVES

Communication Skills play an important role in career development. This lab course aims at actively involving students in various activities to improve their communication skills with an emphasis on developing personality of the students.

COURSE OUTCOMES

After undergoing this course, the students must be able to:

1. Develop listening skills for enhancing communications.

2. Develop speaking skills with a focus on correct pronunciation and fluency.

3. Introduce the need for personality development - Focus will be on developing certain qualities which will aid students in handling personal and career challenges, leadership skills etc., for that purpose group discussion extempore and other activities should be conducted during lab classes.

COURSE CONTENTS

Unit -1 Communication: Theory and Practice (08 Periods)

1.1 Basics of Communication, Definition Process of Communication

1.2 Types of communication (formal and informal, verbal and non-verbal), 7 C's of Communication

1.3 Barriers to communication and ways to overcome them

1.4 Tools or devices of Communication

Unit – 2 Soft Skills for Professional Excellence (04 Periods)

2.1 Introduction to Soft skills and hard skills

2.2 Importance of soft skills

2.3 Applying soft skills across cultures

Unit – 3 Reading Comprehension: English for Communication (08 Periods)

On Communication

3.1 Professional Development of Technicians

3.2 Leadership and Supervision

3.3 The Romance of Reading

3.4 Sir C V Raman

Unit: 4 Professional Writing (14 Periods)

CV Writing, Covering Letter, Resume, Notices, Precis -Writing, Official Letters (Memo, Circular, Office Orders, Agenda, Minutes of Meeting, Report Wring, E-mail Drafting)

Unit: 5 Vocabulary and Grammar (08 Periods)

5.1 Sentence and its Types

5.2 Parts of Speech

5.3 Tenses

5.4 Active and Passive Voice

5.5 Punctuation

5.6 One Word Substitution, Idioms and Phrases

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by RevathiSrinivas; Abhishek Publications, Chandigarh.
2. 2. Communication Techniques and Skills by R. K. Chadha; DhanpatRai Publications, New Delhi.
3. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.
4. Excellent General English-R.B.Varshnay, R.K. Bansal, Mittal Book Depot, Malhotra
5. The Functional aspects of Communication Skills – Dr. P. Prsad, S.K. Katria& Sons, New Delhi
6. Q. Skills for success – Level & Margaret Books, Oxford University Press.
7. E-books/e-tools/relevant software to be used as recommended by AICTE/UPBTE/NITTTR.
8. English for Communication (text Book Published by IRDT, Kanpur 1998).

Websites for Reference:

1. http://www.mindtools.com/ page 8.html – 99k

2. http://www.letstalk.com.in

3. http://www.englishlearning.com

4. http://learnenglish.britishcouncil.org/en/

5. http://swayam.gov.in

APPLIED MATHEMATICS-I

(DAPPL-102)

L	T	P
3	1	0

COURSE OBJECTIVES

Contents of this course provide fundamental base for understanding elementary mathematics and their uses in solving engineering problems. Contents of this course will enable students to use basic mathematical function like logarithms, partial fractions, matrices and basic 2D curves in solving various engineering problems of all fields.

COURSE OUTCOMES

After undergoing this course, the students will be able to:

- Understand and apply angle measurements, T-Ratios, and graph functions.
- Grasp the concepts of limits, differentiation and apply differentiation rules.
- Resolve proper and improper fractions into partial fractions with various factors.
- Solve problems using permutations and combinations and apply the binomial theorem.
- Understand complex numbers in different forms , perform arithmetic operations and applications of De Moivre's theorem.

COURSE CONTENT

UNIT - I: Trigonometry (10 Periods)

Concept of angles, measurement of angles in degrees, grades and radians and their conversions, T-Ratios of Allied angles (without proof), Sum, difference formulae and their applications (without proof). Product formulae (Transformation of product to sum, difference and vice versa). T- Ratios of multiple angles, sub multiple angles (2A, 3A, A/2). Graphs of | x | , sin x, cos x, tan x and e x .

UNIT-II : Differential Calculus (14 Periods)

Definition of function, concept of limits. Four standard limits $\lim x \to a\ x\ n - a\ n\ x - a$, $\lim x \to 0\ \sin x\ x$ $\lim x \to 0\ a\ x - 1\ x$, $\lim x \to 0\ (1 + x)\ 1\ x$. Differentiation of $x\ n$, $\sin x$, $\cos x$,$\tan x$, $e\ x$, $\log e x$ by definition. Differentiation of sum, product and quotient of functions. Differentiation of function of a function. Differentiation of trigonometric and inverse trigonometric functions, logarithmic differentiation, exponential functions.

UNIT - III: Partial fractions: (10 Periods)

Definition of polynomial fraction, proper & improper fractions and definition of partial fractions. To resolve proper fraction and improper fraction into partial fraction with denominator containing non-repeated linear factors, repeated linear factors and irreducible non-repeated quadratic factors.

UNIT- IV : Permutations , Combinations and Binomial theorem (10 Periods)

Value of nPr , nCr and formula based problems. Binomial theorem (without proof) for positive integral index (expansion and general form); binomial theorem for any index (expansion without proof); applications of Binomial theorem.

UNIT-V : Complex Numbers: (10 Periods)

Definition, real and imaginary parts of a complex number, polar and Cartesian representation of a complex number and its conversion from one form to other, conjugate of a complex number, modulus and amplitude of a complex number. Addition, subtraction, multiplication and division of complex numbers. De Moivre's theorem and its simple applications.

RECOMMENDED BOOKS

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.

2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995.

3. Reena Garg, Engineering Mathematics, Khanna Publishing House, New Delhi (Revised Ed. 2018)

4. V. Sundaram, R. Balasubramanian, K.A. Lakshminarayanan, Engineering Mathematics, 6/e., Vikas Publishing House.

5. Reena Garg & Chandrika Prasad, Advanced Engineering Mathematics, Khanna Publishing House, New Delhi.

APPLIED PHYSICS-I

(DAPPL-103)

L	T	P
3	1	0

COURSE OBJECTIVES

Applied physics includes the study of a diversified topics related to the world around us. It aims to give an understanding of this world both by observation and by prediction of the way in which objects behave. Concrete knowledge of physical laws, analysis and applications in various fields of engineering and technology are given prominence in this course content.

COURSE OUTCOMES

After undergoing this course, the students will be able to: Identify the use of S.I. system of measurement and how it is used in engineering

- Represent physical quantities as scalars and vectors, applying the physical laws and concepts of linear

- and circular motion in everyday life. Analyze banking of roads/railway tracks and apply conservation of momentum principle to Explain

- recoil of gun etc. Derive work, power and energy relationship and solve problems about work and power.

- Define work, energy and power and their units.

- Describe conservation of energy and its applications

- Understand the concept of rotational motion of a rigid body and its applications

- Apply the physical laws and concepts of gravity, its variation with height and depth

- Understand the concept of elasticity, surface tension, pressure and the laws governing movement of

- fluids. Express physical work in term of heat and temperature; Measure temperature in various processes on

- different scales (Celsius, Kelvin, Fahrenheit etc.) Distinguish between conduction, convection and radiation and uses in daily life.

COURSE CONTENT

1. Units and Dimensions (6 Periods)

1.1 Need of Measurement in engineering and science, unit of physical quantities - fundamental and derived units, systems of units (FPS, CGS and SI units)

1.2 Dimensions and dimensional formulae of physical quantities.

1.3 Principle of homogeneity of dimensions

1.4 Dimensional equations and their applications, conversion of numerical values of physical quantities from one system of units into another, checking the correctness of physical equations and deriving relations among various physical quantities

1.5 Limitations of dimensional analysis.

2. Force and Motion (6 periods)

2.1 Scalar and vector quantities – examples, representation of vector

2.2 Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only), Scalar and Vector Product.

2.3 Resolution of Vectors.

2.4 Force, Momentum, Statement of Conservation of linear momentum, its applications such as recoil of gun.

2.5 Gravitational force, Acceleration due to gravity (g) and its variation with depth and height from earth surface.

3. Work, Power and Energy (6 periods)

3.1 Work: and its units, examples of zero work, positive work and negative work.

3.2 Friction: modern concept, static, limiting and dynamic friction, Coefficient of friction.

3.3 Energy and its units, Kinetic energy, potential energy and Mechanical energy with examples. 3.4 Work Energy Theorem (statement only), Conservation of mechanical energy for freely falling bodies.

3.5 Power and its units, calculation of power in numerical problems.

4. Circular motion (6 periods)

4.1 Circular motion, Definition of Uniform and Non-uniform Circular motion

4.2 Definition of angular displacement, angular velocity, angular acceleration, frequency, time period.

4.3 Relation between linear and angular velocity, linear acceleration and angular acceleration 4.4 Centripetal acceleration (Definition and formula only)

4.5 Centripetal force with examples such as banking of roads and bending of cyclist. Definition of Centrifugal force.

5. Rotational Motion of a rigid body (6 periods)

5.1 Definition of rigid body, Rotational Motion of rigid body, Definition of torque with examples

5.2 Moment of inertia and its physical significance, radius of gyration for rigid body, Theorems of parallel and perpendicular axes (statements only)

5.3 Moment of inertia of rod, disc, ring and sphere (hollow and solid) (Formulae only).

5.4 Rotational kinetic energy

5.5 Angular momentum, Conservation of angular momentum and its examples

6. Properties of Matter (6 periods)

6.1 Elasticity: definition of stress and strain, Hooke's law (Definition and formula only).

6.2 Pressure: definition, its units.

6.3 Surface tension: concept, its units, cohesive and adhesive forces, angle of contact, Capillary action ascent formula (without derivation), applications of surface tension, effect of temperature on surface tension

6.4 Viscous force, Velocity gradient and its unit, coefficient of viscosity, Stoke's law and effect of temperature on viscosity.

6.5 Stream line flow of fluid motion, Equation of continuity, Bernoulli's Theorem (without derivation) and their applications to Torricelli's formula [v=(2gh)1/2].

7. Heat and Thermometry (6 periods)

7.1 Concept of Heat and Temperature.

7.2 Different scales of temperature and their relationship

7.3 Modes of transfer of heat (Conduction, convection and radiation with examples)

7.4 Expansion of solids: coefficient of linear, surface and cubical expansions and relation amongst them

7.5 Concept of Mercury Thermometer.

RECOMMENDED BOOKS

1. Text Book of Physics for Class XI (Part-I, Part-II); N.C.E.R.T., Delhi

2. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi

3. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd., New Delhi

4. B.Sc. Practical Physics by C L Arora, S. Chand Publication..

5. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi

6. Engineering Physics by DK Bhhatacharya& Poonam Tandan; Oxford University Press, New Delhi

7. Modern Engineering Physics by SL Gupta, Sanjeev Gupta, Dhanpat Rai Publications

8. V. Rajendran,physics-I, Tata McGraw-Hill raw Hill publication, New Delhi

9. Arthur Beiser, Applied Physics, Tata McGraw-Hill raw Hill publication, New Delhi

10. Physics Volume 1, 5th edition, Haliday Resnick and Krane, Wiley publication

APPLIED CHEMISTRY

(DAPPL-104)

L	T	P
3	1	0

COURSE OBJECTIVES

There are numerous number materials are used in fabricating and manufacturing devices for the comfort of life. The selection, characterization and suitability assessment of natural raw materials essentially requires principles and concepts of Applied Chemistry for technicians. On successful completion of this course content will enable technicians to understand, ascertain and analyses and properties of natural raw materials require for producing economical and eco-friendly finished products.

COURSE OUTCOMES

After undergoing this course, the students must be able to:

- Solve various engineering problems applying the basic knowledge of atomic structure and chemical
- Bonding. Use relevant water treatment method to solve domestic and industrial problems.
- Solve the engineering problems using knowledge of engineering materials and properties.
- Use relevant fuel and lubricants for domestic and industrial applications
- Solve the engineering problems using concept of electrochemistry and corrosion.

COURSE CONTENT

Unit 1: Atomic Structure, Chemical Bonding and Solutions (08 periods)

Rutherford model of atom, Bohr's theory (expression of energy and radius to be omitted), Heisenberg uncertainty principle, Quantum number. Shapes of s, p and d orbital's, Pauli's exclusion principle, Hund's rule of maximum multiplicity Aufbau rule, electronic configuration. Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic bond (NaCl), covalent bond (H2 , F2 , HF), coordination bond (NH4) + . Hybridization in BeCl2 , BF3 , CH4 , NH3 , H2O. Anomalous properties of NH3 , H2O due to hydrogen bonding, metallic bonding. Solution – idea of solute, solvent and solution, methods to express the concentration of solution morality (M = mole per liter), Molality, Normality, ppm, mass percentage, volume percentage and mole fraction.

Unit 2: Water (08 periods)

Classification of soft and hard water based on soap test, salts causing water hardness, unit of hardness and simple numerical on water hardness. Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler (scale and sludge, foaming and priming, corrosion etc), and total dissolved solids (TDS). i). Water softening techniques – soda lime process, zeolite process and ion exchange process. ii). Municipal water treatment (in brief only) – sedimentation, coagulation, filtration, sterilization.

Unit 3: Engineering Materials (08 periods)

Natural occurrence of metals – minerals, ores of iron, aluminum and copper, gangue (matrix), flux, slag, brief account of general principles of metallurgy. Extraction of - Aluminum from bauxite ore. Alloys – definition, purposes of alloying, ferrous alloys and non-ferrous with suitable examples, properties and applications. General chemical composition, composition based applications

(elementary idea only, details omitted): Port land cement and hardening, Composite materials (Wood, Glass fiber reinforced composites). Polymers – monomer, homo and co polymers, degree of polymerization, simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics (using PVC, PS, PTFE, nylon – 6, nylon-6,6 and Bakelite), rubber and vulcanization of rubber.

Unit 4: Chemistry of Fuels and Lubricants (09 periods)

Definition of fuel and combustion of fuel, classification of fuels, calorific values (HCV and LCV), calculation of HCV and LCV using Dulong's formula. Fuel rating (octane and cetane numbers). Chemical composition, calorific values and applications of LPG, CNG, water gas, coal gas, producer gas and biogas. Lubrication – function and characteristic properties of good lubricant, classification with examples. Physical properties (viscosity and viscosity index, oiliness, flash and fire point, could and pour point only) and chemical properties (coke number, total acid number saponification value) of lubricants.

Unit 5: Electro Chemistry (09 periods)

Electronic concept of oxidation, reduction and redox reactions. Definition of terms: electrolytes, non-electrolytes with suitable examples, Faradays laws of Electrolysis and simple numerical problems. Industrial Application of Electrolysis – Electrometallurgy• Electroplating• Electrolytic refining.• Application of redox reactions in electrochemical cells – Primary cells – dry cell,• Secondary cell - commercially used lead storage battery, fuel and Solar cells• Introduction to Corrosion of metals –

Definition, types of corrosion (chemical and electrochemical), factors affecting rate of corrosion.

- Internal corrosion preventive measures –Purification, alloying and heat treatment
- External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic Inhibitors.

RECOMMENDED BOOKS

1. Text Book of Chemistry for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi, 2017-18.

2. Agarwal, & Shikha, Engineering Chemistry, Cambridge University Press; New Delhi, 2015.

3. C.N. R. Rao, Understanding Chemistry, Universities Press (India) Pvt. Ltd., 2011.

4. Dara, S. S. & Dr.S.S.Umare, Engineering Chemistry, S.Chand. Publication, New Delhi, New Delhi, 2015.

5. Jain & Jain, Engineering Chemistry, Dhanpat Rai and Sons; New Delhi, 2015.

6. Dr. Vairam, S., Engineering Chemistry, Wiley India Pvt.Ltd., New Delhi, 2013.

7. Dr. G. H. Hugar & Prof A. N. Pathak, Applied Chemistry Laboratory Practices, Vol. I and Vol. II,NITTTR, Chandigarh, Publications, 2013-14.

8. Agnihotri, Rajesh, Chemistry for Engineers, Wiley India Pvt.Ltd., 2014.

ENGINEERING DRAWING

(DENGI -105)

L	T	P
3	0	0

COURSE OBJECTIVES

Drawing is the language of engineers and technicians. Reading and interpreting engineering drawing is their day to day responsibility. The subject is aimed at developing basic graphic skills in the students so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation. The emphasis, while imparting instructions, should be to develop conceptual skills in the students following BIS SP 46 – 1988.

COURSE OUTCOMES

After undergoing the subject, the students will be able to:

- Identify and use of different grades of pencils and other drafting instruments which are used in engineering field Draw free hand sketches of various kinds of objects
- Utilize various types of lines used in engineering drawing.
- Read and apply different dimensioning methods on drawing of objects.
- Use different types of scales and their utilization in reading and reproducing drawings of objects and
- maps. Draw 2 - dimensional view of different objects viewed from different angles(orthographic views)
- Draw and interpret complete inner hidden details of an object which are otherwise notvisible in normal view To make projections of Solid
- Generate isometric (3D) drawing from different 2D (orthographic) views/sketches.
- Identify conventions for different engineering materials, symbols, sections of regular objects and general fittings used in Civil and Electrical household appliances Use basic commands of AutoCAD.

COURSE CONTENT

Unit – I Basic elements of Drawing

Introduction to drawing instruments, materials, layout and sizes of drawing sheets and drawing boards. Different types of lines as per BIS specifications Practice of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles, circles, ellipses and curves, hexagonal, pentagon with the help of drawing instruments.

Common symbols and conventions of materials used in engineering. Free hand and instrumental lettering (Alphabet and numerals) – Capital Letter, single stroke, vertical and inclined, series of 5,8,12 mm in the ratio of 7:4

Dimensioning-

Necessity, method and principles, Dimensioning of overall sizes, circles, threaded holes, chamfered surfaces, angles, tapered surfaces, holes, equally spaced on P.C.D., counter sunk holes, counter bored holes, cylindrical parts, narrow spaces and gaps, radii, curves and arches Scales. Scales –Needs & importance (theory), R.F., type of scales, and length of scale, drawing of plain and diagonal scales.

Unit – II Orthographic projections

Introduction, Projection of Points in different quadrant, Projection of Straight Line- parallel to both planes, perpendicular and inclined to reference plane, Projection of Plane – Different lamina like square, rectangular, triangular and circle inclined to one plane, parallel and perpendicular to another

plane in 1st angle only, Three views of orthographic projection of different objects. Identification of surfaces.

Unit – III Projection of Solid and Sections

Definition and types of Solids, To make projections, sources, Top view, Front view and Side view of various types of Solid, Importance and salient features. Drawing of full section, half section, partial or broken out sections, Off-set sections, revolved sections and removed sections, Convention sectional representation of various materials, conventional breaks for shafts, pipes, rectangular, square, angle, channel, rolled sections.

Unit – IV Isometric Projections

Introduction, Isometric scale and Natural scale, Isometric view and isometric projection, Illustrative problems related to objects containing lines, circles and arcs shape only. Conversion of orthographic views into isometric view /projection.

Unit-V Introduction to Auto CAD

Basic introduction and operational instructions of various commands in Auto CAD. At least two sheets on AutoCAD of cube, cuboids, cone, pyramid, truncated cone and pyramid, sphere and combination of above solids.

RECOMMENDED BOOKS

1. A Text Book of Engineering Drawing by Surjit Singh; Dhanpat Rai & Co., Delhi

2. Engineering Drawing by PS Gill; SK Kataria & Sons, New Delhi

3. Elementary Engineering Drawing in First Angle Projection by ND Bhatt; Charotar Publishing House Pvt. Ltd., Anand

4. Engineering Drawing I & II by JS Layall; Eagle Parkashan, Jalandhar

5. Engineering Drawing I by DK Goel, GBD Publication.

COMMUNICATION SKILLS IN ENGLISH LAB

(DCOMM-106)

L	T	P
0	0	2

LIST OF PRACTICALS

Unit-1 Listening skills

1.1 Introduction to listening process and practice

1.2 Listening to recorded lectures/speeches/poems/interviews and Dialogues

Unit 2 Introduction to phonetics

2.1 Sounds: consonants, vowels (Monophthongs and Diphthongs)

2.2 Transcription of words (IPA) syllable diversion and word stress

Unit 3 Speaking skills

3.1 Self and Peer introduction

3.2 Extempore-Just a minute session

3.3 Greeting and starting conversation

3.4 Leave taking

3.5 Wishing well

3.6 Talking about likes and dislikes

3.7 Asking questions-polite responses

3.8 Apologizing/forgiving

3.9 Complaining/Warning

4.0 Asking and giving information

4.1 Getting and giving Permission

4.2 Asking for and giving Opinion

4.3 Delivering formal speeches

4.4 Mock Interviews

4.5 Presentation

4.6 Conversation practices in various situations such as -asking address, enquiries at places like shop, service center, bank, customer care etc. retail

Unit 4 Building Vocabulary

4.1 Word Formation

4.2 Phrasal Verbs, Foreign Phrases, Jargons

4.3 Word Games such as crosswords, scrabble, quiz spell it etc. (To enhance self-expression and vocabulary of participants.

APPLIED PHYSICS-I LAB

(DAPPL-107)

L	T	P
0	0	2

LIST OF PRACTICALS (To perform any Six Practicals)

1. To measure length, radius of a given cylindrical body using a vernier calipers and find its volume.
2. To determine diameter of a wire using a screw gauge and find its volume.
3. To determine the Radius of curvature of (i) convex mirror, (ii) concave mirror by spherometer.
4. To determine value of acceleration due to gravity (g) using simple pendulum.
5. To verify parallelogram law of forces.
6. To find the coefficient of friction between wood and glass using a horizontal board.
7. To determine the viscosity of glycerine by Stoke's method.
8. To verify law of conservation of mechanical energy (PE to KE).
9. To measure room temperature and temperature of hot bath using mercury thermometer and convert it into different scales.
9. To determine force constant of spring using Hooks law.

APPLIED CHEMISTRY LAB

(DAPPL-108)

L	T	P
0	0	2

LIST OF PRACTICALS: Perform any Ten Laboratory Practical

Volumetric and Gravimetric analysis:

1. Preparation of standard solution of oxalic acid or potassium permanganate.

2. To determine strength of given sodium hydroxide solution by titrating against standard oxalic acid solution using phenolphthalein indicator.

3. Standardization of KMnO4 solution using standard oxalic acid and determine the percentage of iron present in given Hematite ore by KMnO4 solution.

4. Iodometric estimation of copper in the copper pyrite ore.

5. Volumetric estimation of total acid number (TAN) of given oil.

6. Volumetric estimation of: a) Total hardness of given water sample using standard EDTA solution. b) Alkalinity of given water sample using 0.01M sulphuric acid.

7. Proximate analysis of coal: a) Gravimetric estimation of moisture in given coal sample. b) Gravimetric estimation of ash in given coal sample.

Instrumental analysis:

8. Determine the conductivity of given water sample.

9. Determination of the iron content in given cement sample using colorimeter.

10. Determination of calorific value of solid or liquid fuel using bomb calorimeter.

11. Determination of viscosity of lubricating oil using Redwood viscometer.

12. Determination of flash and fire point of lubricating oil using Abel's flash point apparatus.

13. To verify the first law of electrolysis of copper sulfate using copper electrode.

14. Construction and measurement of e. m. f of electrochemical cell (Daniel cell).

15. To study the effect of dissimilar metal combination.

ENGINEERING WORKSHOP PRACTICE

(DGEN- 109)

L	T	P
0	0	4

COURSE OBJECTIVES

The course aims to provide hands-on experience and practical skills in various essential workshops, including carpentry, fitting, welding, sheet metal, plumbing, and painting and polishing. Students will gain proficiency in using different tools and machines, understanding and executing various processes and operations, and completing multiple jobs that involve intricate tasks. This practical knowledge will equip students with the necessary skills to handle real-world tasks efficiently, fostering a deeper understanding of the techniques and safety measures required in each shop.

COURSE OUTCOMES

At the end of the course, the student will be able to:

1. Acquire skills in basic engineering practice to identify, select and use various marking, measuring, and holding, striking, and cutting tools & equipment's and machines
2. Explain job drawing and complete jobs as per specifications in allotted time
3. Inspect the job for the desired dimensions and shape
4. Operate, control different machines and equipment's adopting safety practices

DETAILS OF PRACTICAL CONTENTS

1. CARPENTRY SHOP

1.1. Demonstration of different wood working tools / machines.

1.2. Demonstration of different wood working processes, like planning, marking, chiseling, grooving, turning of wood etc.

1.3. Three jobs involving joint like mortise and tenon, dovetail, bridle, and half lap.

2. FITTING SHOP

2.1. Demonstration of different fitting tools and drilling machines and power tools

2.2. Demonstration of different operations like filing, drilling, tapping, sawing, cutting etc.

2.3. Three fitting job involving practice of cutting, chipping, filing, marking, hacks awing, drilling, tapping, etc.

3. WELDING SHOP

3.1. Demonstration of different welding tools/machines.

3.2. Demonstration on Arc Welding, Gas Welding, MIG welding, gas cutting and rebuilding of broken parts with welding.

3.3. Two simple job involving butt and lap joint and T. Joint using electric arc welding.

4. SHEET METAL SHOP

4.1. Demonstration of different sheet metal tools/machines.

4.2. Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering, brazing, and riveting.

4.3. Three simple job involving sheet metal operations, soldering, and riveting.

4.4. Jobs

4.4.1. Cutting Practices

4.4.2. Single / Double Seam Joint

4.4.3. Cylinders

5. PLUMBING SHOP

5.1. Demonstration of different plumbing tools, accessories, valves and different pipe fittings and joints (GI and PVC).

5.2. Demonstration of different plumbing operations like cutting, threading, pipe fitting (GI and PVC).

5.3 One simple job involving pipe cutting and external thread cutting on GI pipe.

6. PAINTING AND POLISHING SHOP

6.1. Introduction of paints, Varnishes, Reason for Surface preparation, Advantage of painting, other method of surface coating i.e. Electroplating etc.

6.2. Jobs

6.2.1. To prepare a wooden surface for painting apply primer on side and to paint in the same side.

6.2.2. To prepare metal surface for painting, apply primer and paint on same side.

6.2.3. To Prepare a metal surface for spray painting. First spray primer and paint the same by spray gun and compressor system.

REFERENCES:

1. S.K. Hajara Chaudhary, Workshop Technology, Media Promoters and Publishers, New Delhi, 2015

2. B.S. Raghuwanshi, Workshop Technology, Dhanpat Rai and sons, New Delhi 2014

3. J.P. Bhati, Engineering Workshop, C.B.H. Publication, Jaipur.

4. K. Venkat Reddy, Workshop Practice Manual, BS Publications, Hyderabad 2014

5. Kents Mechanical Engineering Hand book, John Wiley and Sons, New York

6. Roop Lal and Bharadwaj P. K., Prarambhik KaryashalaTakneeki (Hindi), Vayu Education of India, New Delhi

APPLIED MATHEMATICS-II

(DAPPL- 201)

L	T	P
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COURSE OBJECTIVES

This course is designed to give a comprehensive coverage at an introductory level to the subject of matrices, integral calculus, coordinate geometry, basic elements of vector algebra and first order differential equations.

COURSE OUTCOMES

After undergoing this course, the students will be able to:

- Solve linear equations using determinants and matrix algebra.
- Perform integration techniques, solve area and volume problems.
- Solve first order differential equations and apply numerical methods.
- Form and interpret equations of lines, circles and conics.
- Perform vector operations and solve related engineering problems of relevant branch.

COURSE CONTENTS

UNIT - I: Determinants and Matrices (10 periods)

Elementary properties of determinants up to 3rd order, consistency of equations, Crammer's rule. Algebra of matrices, inverse of a matrix, matrix inverse method to solve a system of linear equations in three variables.

UNIT - II: Integral Calculus (12 periods)

Integration as inverse operation of differentiation. Simple integration by substitution, by parts and by partial fractions (for linear factors only). Introduction to definite integration. Use of formulae $\pi\ \pi\ \pi \int 2$ $\sin nxdx$, $\int 2\ \cos nxdx$, $\int 2\ \sin mx \cos nxdx$ for solving problems ,where m and n are positive integers. 0 0 0 Applications of integration for (i). Simple problems on evaluation of area bounded by a curve and axes. (ii). calculation of volume of a solid formed by revolution of an area about axes. (Simple problems).

UNIT-III: Differential Equations & Numerical Methods (15 periods)

Definition of differential Equations, order and degree of a differential equation, formation of differential equations, solution of first order and first degree differential equations by variable separable method (simple problems). Trapezoidal rule, Simpson's 1/3 and Simpson's 3/8 rule and their applications in simple cases. MATLAB – Simple Introduction.

UNIT - IV: Two dimensional Co-Ordinate Geometry (10 periods) Equation of straight line in various standard forms (without proof), intersection of two straight lines, angle between two lines. Parallel and perpendicular lines, perpendicular distance formula. General equation of a circle and its characteristics.

To find the equation of a circle, given: i. Centre and radius, ii. Three points lying on it and iii. Co-ordinates of end points of a diameter

Definition of conics (Parabola, Ellipse, Hyperbola), their standard equations without proof. Problems on conics when their foci, directories or vertices are given.

UNIT - V: Vector Algebra (9 periods)

Definition notation and rectangular resolution of a vector. Addition and subtraction of vectors. Scalar and vector product of two vectors. Simple problems related to work, moment and angular velocity.

RECOMMENDED BOOKS

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.

2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995.

3. S.S. Sabharwal, Sunita Jain, Eagle Parkashan, Applied Mathematics, Vol. I & II, Jalandhar.

4. Comprehensive Mathematics, Vol. I & II by Laxmi Publications, Delhi.

5. Reena Garg & Chandrika Prasad, Advanced Engineering Mathematics, Khanna Publishing House, New Delhi

APPLIED PHYSICS – II

(APPL-202)

L	T	P
2	1	-

COURSE OBJECTIVES

Applied physics includes the study of a diversified topics related to the world around us. It aims to give an understanding of this world both by observation and by prediction of the way in which objects behave. Concrete knowledge of physical laws, analysis and applications in various fields of engineering and technology are given prominence in this course content.

COURSE OUTCOMES

After undergoing this subject, the student will be able to;

- Define wave motion its types (Transverse and Longitudinal), Periodic and Simple Harmonic Motion, solve simple problems.
- Define the terms: frequency, amplitude, wavelength, velocity of a wave.
- Explain various Engineering, Medical and Industrial applications of Ultrasonic.
- Define capacitance and its unit. They will be able to explain the function of capacitors in simple circuits, solve simple problems using C=Q/V Explain the role of free electrons in insulators, conductors and semiconductors, qualitatively the terms
- potential, potential difference, electromotive force. Explain the concept of electric current, resistance and its measurement.
- List the effects of an electric current and their common applications, State and apply Ohm's law, calculate the equivalent resistance of a variety of resistor combinations.
- Explain Bio- Savart Law, Lorenz Force, Faraday's law.
- State the laws of electromagnetic induction, describe the effect on a current-carrying conductor when
- placed in a magnetic field Apply the knowledge of diodes in various electronic circuits. Apply the concept of light amplification in designing of various LASER based instruments and optical sources.
- Explain total internal reflection and apply this concept for optical fiber and its uses in Medical field and Communication.

COURSE CONTENTS

1. Oscillations and Wave motion (06 periods)

1.1 Harmonic Motion, Oscillation, Definition of Simple Harmonic Motion (SHM),

1.2 Displacement equation y = a sin wt (without derivation), velocity, acceleration, time period, frequency in S.H.M., Energy of a body executing S. H. M.

1.3 Wave motion, transverse and longitudinal wave motion with examples.

1.4 Wave equation, phase, phase difference, wave length, wave velocity.

1.5 Ultrasonic – Introduction, properties and applications in engineering and medical applications.

2. Optics (06 periods)

2.1 Basic optical laws - Reflection and Refraction, Refractive Index.

2.2 Critical angle, Total internal reflection (TIR) and conditions for total internal reflection,

2.3 Application of total internal reflection (List Only).

2.4Dual nature of light (concept only): Wave and particle nature of light

2.5Examples of Wave and particle nature of light (List Only).

3. Electrostatics (06 periods)

3.1Concept of charge, Quantization of charge, Coulombs law, Electric field of point charges

3.2Electric lines of force and their properties, Electric flux, Gauss law of electrostatics (without derivation)

3.3 Electric potential and potential difference.

3.4Capacitance and its units, Parallel plate Capacitor: Working principle and its Capacitance, Effect of Dielectric on capacitance.

3.5 Series and parallel combination of capacitors (numerical).

4. Current Electricity (06 periods)

4.1Electric Current and its unit, Ohm's law, Resistance and its units,

4.2Factors affecting Resistance of a wire, Specific Resistance, Conductance, Specific Conductance,

4.3Series and Parallel combination of Resistances.

4.4Kirchhoff's laws (KCL and KVL), Wheatstone bridge: Construction and its balanced condition,

4.5Measurement of an unknown resistance using Meter Bridge.

5. Electromagnetism (06 periods)

5.1Biot-Savart law for current carrying wire and Concept of Magnetic field (B) and it units.

5.2Lorentz force (Force on moving charge in magnetic field), Force on current carrying conductor (Formula only).

5.3Magnetic lines of forces and their properties, magnetic flux and its units.

5.4Concept of electromagnetic induction, Faraday's Laws and Lenz's law.

5.5 Conversion of galvanometer into ammeter and voltmeter.

6. Semiconductor physics (06 periods)

6.1Classification of solids on the basis of Energy bands (Definition only): Insulator, Semi-conductor and Conductor.

6.2Intrinsic and extrinsic semiconductors, P-type and N-type semiconductors.

6.3PN junction diode and its biasing (Forward and Reverse Biasing).

6.4Some application of semiconductor diodes (list only)

6.5Construction of PNP and NPN transistors and some electronic applications (list only)

7. Modern Physics (06 Periods)

7.1Ground, Excited and Met stable energy levels of atom,

7.2Spontaneous and stimulated emission, population inversion, pumping, Laser and its characteristics

7.3Ruby laser and He- Ne laser, Engineering and medical applications of lasers.

7.4Introduction to optical fibers, light propagation, acceptance angle and numerical aperture (without derivation).

7.5Applications of optical fibers in telecommunication, medical and sensors.

RECOMMENDED BOOKS

1. Text Book of Physics (Part-I, Part-II); N.C.E.R.T., Delhi
2. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
3. A Text Book of Optics, Subramanian and Brij Lal, S Chand & Co., New Delhi
4. Practical Physics, by C. L. Arora, S Chand publications
5. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
6. Modern Engineering Physics by SL Gupta, Sanjeev Gupta, Dhanpat Rai Publications.
7. Physics Volume 2, 5th edition, Haliday Resnick and Krane, Wiley publication
8. Fundamentals of Physics by Haliday, Resnick & Walker 7th edition, Wiley publication

INTRODUCTION TO IT SYSTEM

(DIIS-203)

L	T	P
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COURSE OBJECTIVES

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools using MS Office/Open Office/Libre Office using internet etc., form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

COURSE OUTCOMES

After undergoing the subject, the students will be able to:

- Identify Computer Hardware Components, Network Components and Peripherals.
- Explain the role of an Operating System.
- Install System and Application Software.
- Explain the function of the system components including Processor, Motherboard and Input output devices.
- Use Word Processing Software to prepare document.
- Use Spreadsheet Software to create workbooks and automate calculation.
- Use Presentation Software to create interactive presentation.
- Perform fundamental tasks common to most application software including print, scan, save, edit, cut, copy, paste, format, spell and grammar check.
- Find and evaluate information on the Web.
- Install Antivirus.
- Safeguard against Online Frauds, threats and crimes.
- Use online office tools (Google suits)

COURSE CONTENTS

1. **Introduction to Computers and Peripherals. (05 Periods)**

   Introduction, Computer Generations, Components of Computer, Types of Computer, CPU, RAM, ROM, Hard disk, USB, Flash drive, Keyboard, Mouse, display devices, Printer, Scanner, Modem, Sound Cards, Speakers, CMOS battery, Sharing of Printers.

2. **Operating System and Application Software (06 Periods)**

   System Software, Application Software, Virtualization Software, Utility Software, MS Office/Open Office/LibreOffice, Working with windows OS, Desktop components, Menu bars, creating shortcut of program. Installation of Application software's, Antivirus and Drivers.

3. **Office Tools: MS Office/Open Office/ Libre Office (06 Periods)**

   Creation of document, spreadsheets and presentation, Google Suits (Google drive, google sheet, google doc, google presentation)

4. **Internet (06 Periods)**

   Network topologies, Basics of Networking,– LAN,MAN, WAN, Connecting Devices(Bridge, Switch, Router, Gateway),Wi-Fi technologies, Concept of IP Address, DNS, Search Engines, email, Web Browsing.

5. **Basics of Information Security (05 Periods**)

   Introduction to security, Security threats: detection and prevention, Indian Cyber laws.

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi
3. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
4. Computers Today by SK Basandara, Galgotia publication Pvt Ltd. Daryaganj, New Delhi.
5. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi.
6. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi

FUNDAMNTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(DFEEE-204)

L	T	P
2	1	-

COURSE OBJECTIVES

To learn basic concepts of various active and passive electronic components, signals, measuring instruments, digital electronics, electric and magnetic circuits, ac circuits, transformer, motors and their applications. To help the students deal with the electrical and electronics engineering principles and applications in industrial processes of different fields.

COURSE OUTCOMES

After undergoing the subject, the students will be able to:

- Understand and identify key electronic components and their applications.
- Use and understand basic electrical measuring instruments.
- Grasp the fundamentals of logic gates, Boolean algebra, and digital circuits.
- Understand basic concepts of electric and magnetic circuits.
- Analyze A.C. circuits and understand phase relationships and power calculations.
- Understand the principles and applications of transformers and electrical machines.

COURSE CONTENTS

UNIT- I Overview of electronic components: (09 Periods)

Active and Passive components, Resistor, Capacitor, Inductor and their types. Introduction to semiconductor, Intrinsic and Extrinsic semi-conductors, P-N Junction diode - forward and reverse bias; introduction of Bipolar Junction Transistor; FET and MOSFET (brief idea only).

UNIT- II Basic measuring instruments: (05 Periods)

Basic concept of Ideal and non-ideal voltage and current sources, ammeter, voltmeter, wattmeter and digital multimeter, CRO (Block diagram, working and its uses).

UNIT –III Overview of Digital Electronics: (7 Periods)

Analog and digital signal, advantages of digital system. number system and its conversion (Decimal, binary ,octal ,hexadecimal) , Boolean Algebra, Logic Gates-Truth Table and Symbol of AND, OR, NOT, NAND, NOR, ExOR, ExNOR Gates.

Unit -IV Electric and Magnetic Circuits: (7 Periods)

Definitions of basic terms, such as Current, Resistance, EMF, Potential Difference, Power and Energy, Ohm's Law and its limitation, Kirchhoff's laws; M.M.F, magnetic force, flux, permeability, reluctance, BH curve, hysteresis loop; Electromagnetic induction, Faraday's laws of electromagnetic

induction, Lenz's law; Dynamically and Statically induced emf; concept of self and mutual inductance.

Unit -V A.C. Circuits: (7 Periods)

Cycle, Frequency, Periodic time, Amplitude, Angular velocity, RMS value, Average value, Form Factor Peak Factor, impedance, phase angle, and power factor; Mathematical and phasor representation of alternating emf and current; A.C in pure resistors, pure inductors and pure capacitors; Power in A.C. Circuit, power triangle; Introduction of poly phase system and comparison with single phase system.

Unit -VI Transformers and Machines: (7 Periods)

Single phase transformer: General construction, working principle, types, EMF equation, transformation ratio; Brief idea of Auto transformer. DC machines: Types, EMF equation of motor. Single Phase Induction Motor: Principle of operation and introduction to methods of starting. Three Phase Induction Motor: Principle of operation.

REFERENCE BOOKS –

1. Ritu Sahdev, Basic Electrical Engineering, Khanna Publishing House.

2. Mittle and Mittal, Basic Electrical Engineering, McGraw Education, New Delhi, 2015, ISBN: 978-0-07-0088572-5.

3. Saxena, S. B. Lal, Fundamentals of Electrical Engineering, Cambridge University Press, latest edition, ISBN: 9781107464353.

4. Theraja, B. L., Electrical Technology Vol – I, S. Chand Publications, New Delhi, 2015, ISBN: 9788121924405.

5. Theraja, B. L., Electrical Technology Vol – II, S. Chand Publications, New Delhi, 2015, ISBN: 9788121924375.

6. Jegathesan, V., Basic Electrical and Electronics Engineering, Wiley India, New Delhi, 2015, ISBN: 97881236529513.

7. Sedha, R.S., A Textbook of Applied Electronics, S. Chand, New Delhi, 2008, ISBN-13: 978-8121927833.

ENGINEERING MECHANICS

(DEM-205)

L	T	P
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COURSE OBJECTIVES

The course provides a foundational understanding of mechanics, covering force systems, equilibrium, and beam analysis under different loads. It explores friction and its applications, centroids and moments of inertia for various shapes, and the principles and applications of simple lifting machines.

COURSE OUTCOMES

After completing this course, student will be able to:

1. Identify the force systems for given conditions by applying the basics of mechanics.
2. Determine unknown force(s) of different engineering systems.
3. Apply the principles of friction in various conditions for useful purposes.
4. Find the centroid and centre of gravity of various components in engineering systems.
5. Select the relevant simple lifting machine(s) for given purposes.

COURSE CONTENTS

Unit – I Introduction to Engineering Mechanics and Force System : (08 Periods)

Basic Concept and definitions, Law of Mechanics (Newton's Laws), Classification: Statics and Dynamics. Principle of transmissibility of forces, System of forces and its classification, Moment of Force and couple, Resolution of force- Orthogonal component of force, Varignon's theorem, Composition of forces Analytical method for determination of resultant for concurrent, non-concurrent and parallel co- planar force systems- Law of triangle, parallelogram and polygon of forces.

Unit– II Equilibrium of Forces and Concept of Beam: (10 Periods)

Condition of equilibrium, free body diagram (FBD), equilibrium of coplanar concurrent and nonconcurring forces, Lami's Theorem- statement and explanation, application for various engineering problems. Beam- Types of beam, supports (simple, hinged, roller and fixed) and loads acting on beam (Vertical and inclined point load, uniformly distributed load, couple). Beam reaction for cantilever, simply supported beam with or without overhang subjected to combination of point load and uniformly distributed load.

Unit– III Friction : (06 Periods)

Introduction , types and Laws of friction, Co-efficient of friction, angle of friction, angle of repose, cone of friction, equilibrium of bodies on horizontal surface (force parallel and inclined to the plane) and inclined plane (force parallel to the plane only).

Unit– IV Centroid and Moment of Inertia : (10 Periods)

Concept, definition and determination of Centroid of plain figures (square, rectangle, triangle, circle, semi-circle, quarter circle) and Centre of gravity of symmetrical solid bodies (Cube, cuboid, cone, cylinder, sphere, hemisphere). Concept of moment of inertia, Perpendicular axis theorem and Parallel axis theorem. Concept of second moment of area (Rectangle, Triangle and circle) and composite section (L,T &I).

Unit – V Simple Machines : (08 Periods)

Definition and types, mechanical advantage, velocity ratio. Application and efficiency of simple machines, Law of Machines, Ideal machine, reversible and irreversible machine. System of pulleys (first, second, third system of pulleys) determination of velocity ratio, mechanical advantage and efficiency. Working Principle and application of : wheel and axel, simple screw jack, Worm and worm wheel, single and double winch Crab.

RECOMMENDED BOOKS :

1. D.S. Bedi, Engineering Mechanics, Khanna Publications, New Delhi (2008)
2. Khurmi, R.S., Applied Mechanics, S. Chand & Co. New Delhi.
3. Bansal R K, A text book of Engineering Mechanics, Laxmi Publications.
4. Ramamrutham, Engineering Mechanics, S. Chand & Co. New Delhi.
5. Dhade, Jamadar & Walawelkar, Fundamental of Applied Mechanics, Pune Vidhyarthi Gruh.
6. Ram, H. D.; Chauhan, A. K., Foundations and Applications of Applied Mechanics, Cambridge University Press.
7. Meriam, J. L., Kraige, L.G., Engineering Mechanics- Statics, Vol. I, Wiley Publication, New Delhi.
8. Bhavikatti S.S., Engineering Mechanics, New Age International Publishers

ENVIRONMENTAL SCIENCES

(DES-206)

L	T	P
3	-	-

COURSE OBJECTIVES

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the ecosystem and controlling pollution by various control measures. He should also be aware of environmental laws related to the control of pollution. He should know how to manage the waste. He should know the concept of hazards and disaster management.

COURSE OUTCOMES:

After undergoing the subject, the student will be able to:

- Comprehend the importance of ecosystem and sustainable development.
- Demonstrate interdisciplinary nature of environmental issues
- Identify different types of environmental pollution and control measures.
- Explain environmental legislation acts.
- Demonstrate positive attitude towards judicious use of energy and environmental protection
- Practice energy efficient techniques in day-to-day life and industrial processes.
- Analyze the impact of human activities on the environment
- Understand the basic concept of disaster and hazards.
- Analyze the impact of disaster on various social components.

COURSE CONTENT

1. **Introduction (06 Periods)**

   Basics of ecology, eco system- concept, and sustainable development, Resources renewable and nonrenewable. Global Warming, Climate change and its impact ,Green House Effect, Acid Rain, Concept of Green Building, Ground water management.

2. **Air Pollution and Noise pollution (08 Periods)**

   Source of air pollution. Effect of air pollution on human health, economy, plant, animals. Air Pollution Control Methods. Introduction to Air Pollution and its Prevention and Control Act 1981 & Environmental Protection Act 1986 and Function of State pollution control board and National Green Tribunal (NGT). Source of noise pollution, Unit of noise, Effect of noise pollution, Acceptable noise level, Different method of minimize noise pollution.

3. **Water Pollution and Soil Pollution (11 Periods)**

   Impurities in water, Cause of water pollution, Source of water pollution. Effect of water pollution on human health, Turbidity, pH, total suspended solids, total dissolved solids,

Concept of dissolved O2, BOD, COD. Prevention of water pollution. Introduction to Water (Prevention and Control of Pollution) Act 1974.Concept of rain water harvesting system. Sources of soil pollution, Types of Solid waste- House hold, Hospital, From Agriculture, Biomedical, Animal waste and human waste, sediments and E-waste, Plastic Waste .

Effect of Solid waste, Disposal of Solid Waste- Solid Waste Management.

4. Disaster Causes and Hazards (6 Periods)

4.1 Introduction

4.2 Classification of Natural Disasters

4.3 Classification of Natural Disasters in India

- Earthquake
- Tsunami
- Flood
- Drought
- Land Slide
- Thunderstorm and Lightening

5 Disaster Management (11 Periods)

5.1 Framework

- Yokohama Strategy for a Safer World (1999)
- The Hyogo Framework for Action (HFA) (2005-2015)
- Sendai Framework for Action (SDGS) (2015-2030)

5.2 Disaster Management, Preparedness and Response in India

- National Disaster Management Authority (NDMA) Guidelines
- National Policy on Disaster Management (2009)
- National Disaster Management Act (2005)
- NDRF (National Disaster Response Force), SDRF (State Disaster Response Force), DDRF (District
- Disaster Response Force), and Aapda Mitra.
- Case studies of disaster management efforts: COVID-19 Pandemic, Earthquakes, Firefighting,
- Thunder Storm, and Lightning.

RECOMMENDED BOOKS –

1. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.

2. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and DeepPublications, New
Delhi.

3. Environmental Pollution by Dr. RK Khitoliya; S Chand Publishing, New Delhi

4. Environmental Science by Deswal and Deswal; DhanpatRai and Co. (P) Ltd. Delhi.

5. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi.

6. Environmental Studies by ErachBharucha; University Press (India) Private Ltd., Hyderabad.

7. Environmental Engineering and Management by Suresh K Dhamija; S K Katariaand Sons,New Delhi.

8. E-books/e-tools/relevant software to be used as recommended by AICTE/BTE/NITTTR,Chandigarh.

9. Disaster Management Second Edition AICTE Recommended by S C Sharma, Khanna Publishers

10. Bharat Bhautik Paryavaran Class 11, By NCERT.

11. Apda Avem Apda Prabhandhan | आपदा और आपदा Ůबंधन | Mahesh Kumar Barnwal | CosmosPublication.

12. S.C. Sharma & M.P. Poonia, Environmental Studies, Khanna publishing House, New Delhi

APPLIED PHYSICS-II LAB

(DAPPL-207)

L	T	P
-	-	2

LIST OF PRACTICALS (To perform minimum six experiments)

1. To determine the velocity of sound with the help of resonance tube.
2. To verify the laws of reflection from a plane mirror / interface.
3. To verify the laws of refraction (Snell's law) using a glass slab.
4. To determine the focal length and magnifying power of a convex lens.
5. To verify laws of resistances in series and parallel combination.
6. To verify ohm's laws by drawing a graph between voltage and current.
7. To measure very low resistance and very high resistances using Slide Wire bridge
8. Conversion of Galvanometer into an Ammeter and Voltmeter of given range.
9. To draw characteristics of a PN junction diode and determine knee and break down voltages.
10. To verify the Kirchhoff's Law using electric circuit.
11. To find numerical aperture of an optical fiber.
12. To draw magnetic field lines due to bar magnet using magnetic compass.

INTRODUCTION TO IT SYSTEM LAB

(DIIS-208)

L	T	P
-	-	2

LIST OF PRACTICAL EXERCISES

1. Identify various components, peripherals of computer and list their functions.
2. Installation of operating system. (windows/linux/others)
3. Installation of various application software and peripheral drivers.
4. Creation and Management of files and folders (Rename, delete, search)
5. Installation of Antivirus and remove virus.
6. Scanning and printing documents.
7. Browsing, Downloading, Information using Internet.
8. E-Mail ID creation, composing, sending and receiving e-mail. Attaching a file with e- mail message.
9. Word Processing (MS Office/Open Office) File Management, Editing documents, Mail Merge, Security etc.
10. Spread Sheet Processing (MS Office/Open Office/ Libre Office) Addition, deletion, formulation, Security etc.
11. PowerPoint Presentation (MS Office/Open Office /Libre Office) Preparing Slides, customization,
animation, Security etc.
12. Google Suite.

FUNDAMNTALS OF ELECTRICAL & ELECTRONICS ENGINEERING LAB

(DFEEE-209)

L	T	P
-	-	2

List of Practicals:- (8 practical to be performed)

1. Identify various passive and active electronic components in the given circuit.
2. Determine the value of given resistor using digital multi-meter to confirm with color code.
3. Exercise of soldering and de-soldering of components in circuits.
4. To measure frequency, time period and amplitude of a sinusoidal signal using CRO.
5. To measure voltage and current using digital multi-meter.
6. To verify the truth tables for all logic gates – NOT, OR, AND, NAND, NOR, XOR, XNOR
7. Verify the Kirchhoff's laws.
8. Measure voltage, current and power in 1-phase circuit with resistive load.
9. Verify the ohms law.
10. Use of voltmeter, ammeter, and watt-meter.
11. Connect resistors in series and parallel combination on bread board and measure its value using digital multi-meter.
12. Connect capacitors in series and parallel combination on bread board and measure its value using multi-meter.

ENGINEERING MECHANICS LAB

(DEM-210)

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List of Practical (A minimum of eight practicals must be performed)

1. Verification of parallelogram law of forces.
2. Verification of triangle and polygon law of forces.
3. To find the Resultant of coplanar concurrent forces using force table.
4. Study of forces in various members of jib crane.
5. Determine reaction forces for simply supported beam.
6. Determine the coefficient of friction on horizontal and inclined plane.
7. Study of Ladder friction (analyze condition for equilibrium)
8. Determine the centroid of a composite lamina (Graphical and Analytical methods).
9. Determine moment of inertia of flywheel or physical pendulum or torsional pendulum.
10. To find the mechanical advantage, velocity ratio and efficiency for Screw Jack.
11. To find the mechanical advantage, velocity ratio and efficiency for Wheel and axel.
12. Derive Law of machine using Worm and Worm wheel.