NAME OF COURSE - **BASIC PHYSICS**

SUBJECT CODE- **DE 11**

**TOTAL-60 HOURS**

**OBJECTIVE:**

Student will be able to:

- Measure given dimensions by using appropriate instruments accurately.

- Select proper measuring instrument on the basis of range, least count & precision required for measurement.

- Select proper material for intended purpose by studding properties of materials.

- Identify good and bad conductor of heat.

- Analyze relation among pressure, volume and temperature of gas to interpret the results.

- Identify the effect of interference between light waves.

- Identify properties of laser light and photo electric effect for engineering applications.

- Identify, analyze discriminate and interpret logical sequence of field problems with the study of physics.

**MODULE –I**

**BASIC MEASURING INSTRUMENTS** - Need of Measurement in engineering and science, unit of a physical quantity, requirements of standard unit, systems of units-CGS,MKS and SI, classification of physical quantities - Fundamental and Derived with their units Accuracy, Precision of instruments, Errors in measurement, Estimation of errors -Absolute error, Relative error and percentage err or, significant figures. (Simple Problems)Venire Caliper, Micrometer screw gauge, inner & outer Caliper Thermometer, Sphero-Meter, Ammeter, Voltmeter with their least count, range, accuracy and precision. Standard reference surfaces used in engineering measurements - surface plate, angle plate, V - block, Engineer's square. **(12-HOURS)**

**MODULE –II**

**ELASTICITY :** Deforming force, Restoring force, Elastic and plastic body, Stress and strain with their types, Hooke's law, Stress strain diagram, Young's modulus, Bulk modulus, Modulus of rigidity and relation between them( no derivation), (simple problems). (Simple problems) Stress strain diagrams of Steel, Cast iron, Aluminum and Concrete, Ultimate and breaking stress, Factor of Safety.

**SURFACE TENSION:** Forces—cohesive and adhesive, , angle of contact, shape of liquid surface in a capillary tube, capillary action with examples, relation between surface tension , capillary rise and radius of capillary ( no derivation)( simple problem),effect of impurity and temperature on surface tension.

**VISCOSITY :** Velocity gradient, Newton's law of viscosity, coefficient of viscosity ,streamline and turbulent flow, critical velocity, Reynold's number, (simple problems), Stokes law and terminal velocity( noderivation) ,buoyant (up thrust) force, effect of temperature & adulteration on viscosity of liquid. **(12-HOURS)**

**MODULE –III**

**TRANSMISSION OF HEAT AND EXPANSIONOF SOLIDS**: Three modes of transmission  of heat -conduction, convection and radiation, good and bad conductor of heat with example, law of thermal conductivity, coefficient of thermal conductivity (simple problems), expansion of solids -linear, aerial and cubical and relation between them.

**GAS LAWS AND SPECIFIC HEATS OF GASES** Boyle's law, Charle's law, Gay Lussac's law, absolute temperature, Kelvin  scale of temperature, general gas equation  (no   derivation)(simple problems),molar or universal gas constant, universal gas equation, standard or normal temperature and pressure (N.T.P.), specific heat of gases, relation between two specific heat (simple problems), thermodynamic variables, first law of thermodynamics (statement & equation only), isothermal, isobaric, isochoric & adiabatic processes (difference among these processes and equations of state) (simple problems). **(12-HOURS)**

**MODULE –IV**

**PROPERTIES OF LIGHT** Reflection and, refraction, Snell's law, physical significance of refractive index (simple problems), Total internal reflection, dispersion, diffraction and polarization of light (only introduction)

**WAVE THEORY OF LIGHT & INTERFERENCE** Newton's corpuscles theory of light, Huygen's wave theory, wave front, Types of wave front -spherical , cylindrical and plane Huygen's principle of propagation of wave front, Principle of superposition of waves, Interference of light, constructive and destructive interference, Young's experiment. Analytical treatment of interference, conditions for station ary interference pattern.

**LASER** Light amplification by stimulated emission of radiation, properties of laser, spontaneous and stimulated emission, population inversion, pumping methods, He -Ne laser - construction & working, recording and reconstructing of hologram by using He-Ne laser. **(12-HOURS)**

**MODULE –V**

**PHOTO ELECTRICITY** Plank's hypothesis, properties of photons, photo electric effect laws and characteristics of photoelectric effect, Einstein's photoelectric equation,(simple problems), construction and workingofphotoelectriccell,applicationsofphotoelectriccell

**X-RAYS** ProductionofX-rays,typesofX-rayspectra-continuousand characteristics, X -ray wavelength (simple problems), properties of X-rays, applications of X-rays-engineering, medicine and scientific

research work. **(12-HOURS)**

**OUTCOME:**

The students understand the below mentioned:

- Use of vernier caliper, micrometerscrewgauge, Thermometer, Ammeter and voltmeter.

- Stress & Strain of steel, cast iron, Aluminium etc.

- Relation between surface tension and capillary rise.

- Newton's law of velocity, Raynold's number. Stokes law.

- Refractive index of prism

- Spectrometer.

**LIST OF EXPERIMENTS**

**1.** Refractive index of prism (Spectrometer).

**2.** To find out internal radius of hollow tube by Vernier Calipers.

**3.** To find out volume of given cylinder by screw gauge.

**4.** Surface tension by capillary rise method.

**5.** Determination of coefficient of viscosity.

**6.** Coefficient of thermal conductivity by Searl's method.

**7.** Resolving Powers – Microscope

**8.** Study of Spectrometer

**REFERENCE BOOKS**

| Name of Authors | Titles of the Book | Name of the Publisher |
|---|---|---|
| V. Rajendran | Physics-I | Tata McGraw - Hill raw - Hill publication, New Delhi |
| Arthur Beiser | Applied physics | Tata McGraw - Hill raw - Hill publication, New Delhi |
| by R.K.Gaur and S.L.Gupta | Engineering Physics | Dhanpat Rai Publication, New Delhi. |

NAME OF COURSE - **ENGINEERING DRAWING**
SUBJECT CODE- **DE 12**

**TOTAL-60 HOURS**

**OBJECTIVE :**
The student should be able to:

- Draw the different engineering curves and know their applications.

- Draw orthographic projections of different object.

- Visualize three dimensional objects and draw isometric projections.

- Use the techniques and able to interpret the drawing in engineering field.

- Use computer aided drafting packages**.**

**MODULE I**

**SCALES**: Representative factor, plain scales, diagonal scales, scale of chords.

**CONIC SECTIONS**: Construction of ellipse, parabola, hyperbola by different methods; Normal and Tangent.

**SPECIAL CURVES**: Cycloid, Epi-cycloid, Hypo-cycloid, Involutes, Archimedean and logarithmic spirals. **(10-HOURS)**

**MODULE II**

**PROJECTION**: Types of projection, orthographic projection, first and third angle projection,
**PROJECTION OF POINTS AND LINES**, Line inclined to one plane, inclined with both the plane, True Length and True Inclination, Traces of straight lines. **(10-HOURS)**

**MODULE III**

**PROJECTION OF PLANES AND SOLIDS**: Projection of Planes like circle and polygons in different positions; Projection of polyhedrons like prisms, pyramids and solids of revolutions like cylinder, cones in different positions. **(10-HOURS)**

**MODULE IV**

**SECTION OF SOLIDS:** Section of right solids by normal and inclined planes; Intersection of cylinders.

**DEVELOPMENT OF SURFACES**: Parallel line and radial - line method for right solids.

**MODULE V**

**ISOMETRIC PROJECTIONS:** Isometric scale, Isometric axes, Isometric Projection from orthographic drawing. **(10-HOURS)**

**MODULE VI**

**COMPUTER AIDED DRAFTING (CAD)**: Introduction, benefit, software's basic commands of

drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array; solution of projection problems on CAD. **(10-HOURS)**

**OUTCOME:**

The students learned to draw the below mentioned:

- Ellipse, parabola, hyperbola, involutes, cycloid, epicycloids, hyper cycloid, helix and spiral
- First angle projection method for drawing orthographic projection of lines, planes and solids.
- Isometric projection of planes and solids**.**

**BOOKS:**

1. Visvesvaraya Tech. University; A Premier on Computer Aided Engg drawing; VTU Belgaum
2. Bhatt N.D.; Engineering Drawing, Charotar
3. Venugopal K.;Engineering Graphics; New Age
4. John KC; Engg. Graphics for Degree; PHI.
5. Gill P.S.; Engineering Drawing; kataria
6. Jeyopoovan T.; Engineering drawing & Graphics Using AutoCAD; Vikas
7. Agrawal and Agrawal; Engineering Drawing;TMH Shah MB and Rana BC; Engg.drawing; Pearson Education
8. Luzadder WJ and Duff JM; Fundamental of Engg Drawing; PHI
9. Jolhe DA; Engg. Drawing an Introduction; TMH.
10. Narayana K.L.; Engineering Drawing; Scitech

NAME OF COURSE - **BASIC MATHEMATICS**

SUBJECT CODE- **DE 13**

**TOTAL-60 HOURS**

**OBJECTIVE:**

This subject helps the students to develop logical thinking, which is useful in comprehending the principles of all other subjects.analyical and systematic approach towards any problems developed through learning of this subject. Mathematics being a versatile subject can be used at every stage of human life.

**MODULE I**

**REVISION** Laws of Indices Formula of factorization and expansion $((a^2-b^2)$, $(a+b)^2$ etc.). Laws of logarithm with definition of Natural and Common logarithm.

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

**DETERMINANT AND MATRICES:** Definition and expansion of determinants of order 2 and 3. Cramer's rule to solve simultaneous equations in 2 and 3 unknowns. Definition of a matrix of order mXn and types of matrices. Algebra of matrices such as equality, addition, Subtraction, scalar multiplication and multiplication. Transpose of a matrix. Minor, cofactor of an element of a matrix, adjoint of matrix and inverse of matrix by adjoint method. Solution of simultaneous equations containing 2 and 3 unknowns by matrix inversion method.

**BINOMIAL THEOREM:** Definition of factorial notation, definition of permutation and combinations with formula. Binomial theorem for positive index. General term. Binomial theorem for negative index. Approximate value (only formula) **(15-HOURS)**

**MODULE II**

**TRIGONOMETRY**

**REVISION** Measurement of an angle (degree and radian). Relation between degree and radian. Trig ratios of $0^0, 0, 45^0$ etc. Fundamental identities.

**TRIGONOMETRIC RATIOS OF ALLIED, COMPOUND, MULTIPLE & SUBMULTIPLES**

**ANGLES:** (Questions based on numerical computations, which can also be done by calculators, need not be asked particularly for allied angles). factorization and defactorization formulae

**INVERSE TRIGONOMETRIC RATIOS:** Definition of inverse trigonometric, ratios, Principal

valuesof inverse trigonometric ratios. Relation between inverse trigonometric ratios

**PROPERTIES OF TRIANGLE:** Sine, Cosine, Projection and tangent rules (without proof) Simple problems. **(15-HOURS)**

**MODULE III**

**COORDINATE GEOMETRY POINT AND DISTANCES:** Distance formula, Section formula, midpoint, centriod of triangle. Area of triangle and condition of co-linearity.

**STRAIGHT LINE** Slope and intercept of straight line. Equation of straight line in slope point form, slope -intercept form, two -point form, two-intercept form, normal form. General equation of line. Angle between two straight lines condition of parallel and perpendicular lines. Intersection of two lines. Length of perpendicular from a point on the line and perpendicular distance between parallel lines**.**

**CIRCLE: -** Equation of circle in standard form, centre – radius form, diameter form, two – intercept form. General equation of circle for centre and radius. **(15-HOURS)**

**MODULE IV**

**VECTORS:** Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication) Dot (Scalar) product with properties. Vector (Cross) product with properties. **(15-HOURS)**

**APPLICATION:** Work done and moment of force about a point & line.

**OUTCOME:**
The students understand the below mentioned:

- Partial fraction, determinant, matrices, simultaneous equation by Matrix inversion method, Binomial theorem, Trigonometry, points & distances, straight line, circle, vectors, vector's applications.

| Reference books : | | |
|---|---|---|
| **Name of Authors** | **Titles of the Book** | **Name of the Publisher** |
| S. P. Deshpande | Mathematics for polytechnic | Pune Vidyarthi Griha |
| S. L. Loney | Trigonometry | S. Chand Publication |
| H. S. Hall & S. R. Knight | Higher Algebra | Metric edition, Book Palace, New Delhi |
| Frc.G. Valles | College Algebra | Charotar Publication |
| Ayres | Matrices | Schuam series, McGraw hill |

| B. S. Grewal | Higher Engineering Mathematics | Khanna publications New Dehli |
|---|---|---|
| S. S. Sastry | Engineering Mathematics | Prentice Hall of India |

**TOTAL-60 HOURS**

**OBJECTIVE:**

- Comprehend The given pages

- Answer correctly the questions on seen and unseen passages

- Increase the vocabulary

- Apply the rules of grammar for correct writing

**MODULE I: TEXT**

- Vocabulary - Understanding meaning of new words from text.

- Comprehension – Responding to the questions from text.

- Identifying parts of speech. **(15-HOURS)**

**MODULE II -APPLICATION OF GRAMMAR**

- Verbs.

- Tenses

Do as directed (active / passive, Direct/ indirect, Affirmative/ negative/ assertive, question tag, remove too, use of article, preposition, conjunctions, interjections, punctuation) **(15-HOURS)**

**MODULE III - PARAGRAPH WRITING**

- Definition – Types of paragraphs

- How to write a paragraph **(15-HOURS)**

**MODULE IV - VOCABULARY BUILDING**

- Word formation

- Technical jargon

- Use of synonyms / antonyms/ Homonyms/ paronyms

- One word substitute **(15-HOURS)**

**OUTCOME:**
The students acquire the below mentioned:

- Improvement in vocabulary

- Grammar

- Conversational skill

- Paragraph writing

- News paper report writing

- Errors in English

| Practical :- | |
|---|---|
| S. N o. | **Skills to be developed for practical:** |
| 1. | **Intellectual Skills** : <br>    **1** Skills of speaking in correct English. <br>    **2** Searching information. <br>    **3** Reporting skills. |
| 2. | **Motor Skills:** <br>    **1** Use of appropriate body language. <br>    **2** Use of mouth organs |
| 3. | **List of Assignments:** <br>    **1** Building of Vocabulary — (3 Hours) (2 assignments) <br>    **a)** 25 words for each assignment from the glossary given in the text book at the end of each chapter <br>    **b)** Technical Jargons — (2 Hours) (1 assignment) Identify 10 technical words from the respective branches. Resource — (Encyclopedia/Subject Books) <br>    **2** Grammar (4 Hours) 2assignments. <br>    **a)** Insert correct parts of speech in the sentences given by the teachers. (16 sentences—Two each, from the different parts of speech) <br>    **b)** Punctuate the sentences given by the teachers. (10 sentences) <br>    **3** Conversational skills: Role plays (8 hours) <br>    **a)** Students are going to perform the role on any 6 situations, by the teacher. <br>    **b)** Dialogue writing for the given situations. (2 assignments) <br>    **4** Write Paragraphs on given topics (6 hours) (2 assignments) <br>    **a)** Four types of paragraphs to be written in **two assignments** covering two types in one assignment. <br>    **5** News paper report writing (4hours) ( 2 assignments) <br>    **a)** Write any two events from the news paper as it is. <br>    **b)** Write any two events on the situations given by the teacher. <br>    **6** Errors in English (4 hours) ( 2 assignments) <br>    **a)** Find out the errors and rewrite the sentences given by the teacher. (20 sentences) |

## REFERENCE BOOKS :

| Name of Authors | Titles of the Book | Name of the Publisher |
| --- | --- | --- |
| David Green | Contemporary English grammar, structures and composition | Macmillan |
| R. C. Jain | English grammar and composition | Macmillan |
| Rodgers | Thesaurus | Oriental Longman |
| Oxford | Dictionary | Oxford University |
| Longman | Dictionary | Oriental Longman |
| Z. N. Patil et el | English for practical Purposes | Macmillan |
| Editor – Mukti Sanyal | English at Workplace | Macmillan |

NAME OF COURSE - **ENVIROMENTAL STUDIES**
PAPER CODE- **DE 15**

**TOTAL-60 HOURS**

**OBJECTIVE:**

- The students should be exposed to matter related to energy, ecosystem, air pollution, sound pollution, and water pollution, also urines related to society, ethics & human values.

**MODULE –I**

**ENERGY:** Sources of Energy: Renewable & Non Renewable, Fossil fuel, Biomass Geothermal, Hydrogen, Solar, Wind, Hydal, Nuclear sources. **(12-HOURS)**

**MODULE –II**

**ECOSYSTEM –** Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere, Cycles in Ecosystem –Water, Carbon, and Nitrogen. Biodiversity: Threats and conservation,

**(12-HOURS)**

**MODULE –III**

**AIR POLLUTION & SOUND POLLUTION:** Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution chemical, photochemical, Green house effect, ozone layer depletion, acid Rain. Sound Pollution: Causes, controlling measures, measurement of sound pollution (deciblage), Industrial and non – industrial.

**(12-HOURS)**

**MODULE –IV**

**WATER POLLUTION: –** Pollutants in water, Adverse effects. Treatment of Domestic & Industrial water effluent.

**Soil Pollution:** – Soil Profile, Pollutants in soil, their adverse effects and controlling measures.

**(12-HOURS)**

**MODULE –V**

**SOCIETY, ETHICS & HUMAN VALUES: -** Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, objectives of ethics and its study Preliminary studies regarding Environmental Protection Acts , introduction to value education, self exploration, sanyam & swasthya. **(12-HOURS)**

**OUTCOME:**
The students become aware to below mention:

- Renewable sources of energy

- Threats and conservation to cycles in echosystem

- Industrial and non industrial air and sound pollution.

- Controlling measures to water pollution

- Impact of water on society.

**BOOKS:**

1. Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics"; Cengage Pub.
2. Rana SVS; "Essentials of Ecology and Environment"; PHI Pub.
3. Raynold, GW "Ethics in information Technology"; Cengage.
4. Svakumar; Energy Environment & Ethics in society; TMH

5.      AK De "Environmental Chemistry"; New Age Int. Publ.

6.      BK Sharma, "Environmental Chemistry" ;    Goel Publ. House.

7.      Bala Krishnamoorthy; "Environmental management";  PHI

8.      Gerard Kiely, "Environmental Engineering" ;    TMH

9.      Miller GT JR; living in the Environment Thomson/cengage

10.      Cunninghan WP and MA; principles of Environment Sc;  TMH

11.      Pandey, S.N. & Mishra, S.P. Environment & Ecology, 2011, Ane Books , Pvt. Ltd, New Delhi

12.      Joseph, B. Environmental Studies, 2009 Tata Mcgraw Hill, Edu India Ltd. New Delhi.

13.      Gour R.R, Sangal, R &Bagaria, G.P. , Excel Books, A-45, Naraina Phase-I
                      ,New Delhi.-110028

# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

## DIPLOMA IN ENGINEERING (COMMON)

### DIPLOMA I ST SEMESTER

NAME OF COURSE - **COMPUTER FUNDAMENTALS**
PAPER CODE- **DE 16**

**TOTAL-60 HOURS**

**OBJECTIVE:**
Students will be able to:

- Understand a computer system that has hardware and software components,which controls and makes them useful.

- Understand the operating system as the interface to the computer system.

- Use the basic functions of an operating system.

- Set the parameter required for effective use of hardware combined with an application's.

- Compare major OS like Linux and MS-windows.

- Use file managers, word processors, spreadsheets, presentation software's and internet.

- Have hands on experience on operating system and different application software.

- Use the internet to send mail and surf the world wide web.

**MODULE –I**

**FUNDAMENTALS OF COMPUTER** : Introduction, Components of PC, The system Unit, Front part of system Unit, Back part of system Unit, CPU, Memory of computer Monitor, Mouse, Keyboard, Disk, Printer, Scanner, Modem, Video, Sound cards, Speakers, **(10-HOURS)**

**MODULE –II**

**INTRODUCTION TO WINDOWS 2000/ XP:** Working with window, Desktop Components of window Menu bar, option Starting window, Getting familiar with desktop Moving from one window to another Reverting windows to its previous size, Opening task bar buttons into a windows Creating shortcut of program, Quitting windows. **(10-HOURS)**

**MODULE –III**

**GUI BASED EDITING, SPREADSHEETS, TABLES & PRESENTATION:** Application Using MS Office 2000 & Open Office.Org, Menus, Opening of menus, Toolbars: standard toolbars, formatting toolbars & closing of menus, Quitting Document, Editing & designing your document, Spreadsheets, Working & Manipulating data with Excel, Changing the layout, Working with simple graphs & Presentation, Working With PowerPoint and Presentation. **(10-HOURS)**

**MODULE –IV**

**INTRODUCTION TO INTERNET:** What is Internet, Equipment Required for Internet connection, sending & receiving, Emails Browsing the WWW, Creating own Email Account, Internet chatting.

**(10-HOURS)**

**MODULE –V**

**USAGE OF COMPUTER SYSTEM IN VARIOUS DOMAINS:** Computer application in Offices book's publication, data analysis, accounting, investment, inventory control, graphics, database management, Instrumentation, Airline and railway ticket reservation, robotics, artificial intelligence, military, banks, design and research work, real -time, point of sale terminals, financial transaction terminals. **(10-HOURS)**

**MODULE –VI**

**INFORMATION TECHNOLOGY FOR BENEFITS OF COMMUNITY:** Impact of computer on Society Social responsibilities, Applications of IT, Impact of IT Ethics and information technology, Future with information technology. **(10-HOURS)**

**OUTCOME:**

The students acquire knowledge on:

- Computer system
- Windows operating system.
- Spread sheet,tables,power point
- Internet usages-mail etc.
- Use of computer in various applications.

# LIST OF EXPERIMENTS

1. Study of various components of computer like CPU, keyboard, mouse, monitor, printer, CVT and storage devices.

2. Using Windows operating system, study of desktop, control panel, accessories and settings. File management in windows explorer, Study of WordPad, Note Pad, Paint Brush, Calculator etc.

3. Study of Linux operating system.

4. Study of MS-word – opening and saving of documents, formatting, editing and spell check, find and replace, printing, merging. Creating Table, Charts and Graphics.

5. Study of Spreadsheet – creating, saving, editing and printing. Entering data, selecting cells, formatting text, applying border shades and formulas, creating charts.

6. Study of Power Point – creating, opening, editing and saving of slides. Adding and formatting text, creating animations, working with images and special effects. Printing presentation.

7. Study of MS Access– creating, saving, editing and printing of tables. Managing relationships, writing queries e.g. SELECT UPDATE, DELETE, and INSERT. Forms designing and report printing.

8. Study of Web Browser and mailing programs.

**REFERENCES**

1. A First Course in Computers - S . Jaiswal Golgotha Publication

2. Computers & Application, -Slotnick, Butterfield, Colantonio and Kopetzky C.C. Health & Company

3. Computers Today,

4. The Complete Guide to Microsoft Office Professional, -Ron Mansfield Sybex /BPB Asian Edition

5. Inside IBM PC

6. Hardware Bible

7. Computer Hardware -Osborne Series

8. DOS & Utilities

9. Learning Windows in 24 Hours -Sam Techmedia

10. Multimedia Making it work

11. Understanding windows -BP Chapman B Publication.

NAME OF COURSE - **BASIC WORKSHOP PRACTICE**

SUBJECT CODE- **DE 17**

**TOTAL-60 HOURS**

**OBJECTIVE:**

The student will able to:

- Know basic workshop processes

- Read and interpret job drawing.

- Identify, select and use various marking, measuring holding, holding, striking and cutting tools and equipments.

- Operate, control different machines and equipments.

- Inspect the job for specified dimensions.

- Adopt safety practices while working on various machines.

**MODULE I**

**INTRODUCTION**:- Manufacturing Processes and its Classification, Casting, Machining, Plastic deformation and metal forming, Joining Processes, Heat treatment process, Assembly process. Powder Metallurgy, Introduction to computers in manufacturing. Black Smithy Shop Use of various smithy tools.

**FORGING OPERATIONS: -** Upsetting, Drawing down, Fullering, Swaging, Cutting down, Forge welding, Punching and drafting. Suggested Jobs: - Forging of chisel and forging of Screw Driver. **(12-HOURS)**

**MODULE II**

**CARPENTRY SHOP:-** Timber : Type, Qualities of timber disease, Timber grains, Structure of timber, Timber, Timber seasoning, Timber preservation .Wood Working tools: Wood working machinery, joints & joinery. Various operations of planning using various carpentry planes sawing & marking of various carpentry joints. Suggested Jobs: Name Plate, Any of the Carpentry joint like mortise or tennon joint. **(12-HOURS)**

**MODULE III**

**FITTING SHOP:-** Study and use of Measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, Feeler gauges, Micro meter. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting operations: Chipping filling, Drilling and tapping. Suggested Jobs:- Preparation of job piece by making use of filling, sawing and chipping, drilling and Tapping operations. **(12-HOURS)**

**MODULE IV**

**FOUNDRY**: Pattern Making: Study of Pattern materials, pattern allowances and types of patterns. Core box and core print, .Use and care of tools used for making wooden patterns.

**MOULDING:** Properties of good mould & Core sand, Composition of Green, Dry and Loam sand. Methods used to prepare simple green and bench and pit mould dry sand bench mould using single piece and split patterns. **(12-HOURS)**

**MODULE V**

**WELDING: -** Study and use of tools used for Brazing, Soldering, Gas welding & Arc welding. Preparing Lap & Butt joints using gas and arc welding method. Study of TIG & MIG welding processes, Safety precautions. **(12-HOURS)**

**OUTCOME:**

The student accomplished jobs on carpentry shop, fitting shop, welding shop, foundry shop and black smithy shop.

**LIST OF EXPERIMENTS**

1. BLACK SMITHY SHOP

 A).  Job on Forging of chisel.

 B).  Job on Forging of screw driver.

2. CARPENTRY SHOP

 A).  Job on name plate.

 B).  Job on cross halving joint.

3. FITTING SHOP

 A)  Job on filing and sawing operation.

 B)  Job on drilling & tapping.

4. FOUNDRY SHOP

 A)  Job on Moulding of given pattern.

5. WELDING SHOP

 A)  Job on lap joint by arc welding.

 B)  Job on T-Joint by Arc Welding.

**BOOKS**:

 1. Bawa HS; Workshop Practice, TMH

 2. Rao PN; Manufacturing Technology- Vol.1& 2, TMH

3. John KC; Mechanical workshop practice; PHI

4. Hazara Choudhary; Workshop Practices -, Vol. I & II.

5. Jain. R.K. Production Technology –

# SARVAPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL (M.P.)

## DIPLOMA IN ENGINEERING (COMMON)

### II ND SEMESTER

### NAME OF COURSE: **COMMUNICATION SKILLS**

### SUBJECT CODE: **DE 21**

**TOTAL HOURS -60**

## OBJECTIVE:

The student will be able to

- Understand and use the basic concepts of communication and principles of effective communication in an organized set up and social context.

- Give a positive feed back in various situations, to use appropriate body language & to avoid barriers for effective communication.

- Write the various types of letters, reports and office drafting with the appropriate format.

## MODULE-1

## COMMUNICATION PROCESS AND ITS NEEDS

   (i)     How to make communication effective

   (ii)    Barriers in communication, Removal of barriers

Grammar and vocabulary for correct English usage.

   (I)     Determiners, Prepositions, Auxiliary verbs and subject-verb agreement

   (II)    Rewrite as directed (change voice, correct form of verbs/ tenses)

   (III)   Vocabulary– One    word substitution, words often misused and wrongly spelt.

**(12 HOURS)**

## MODULE -2

## PASSAGES OF COMPREHENSION

Prescribed passages ( six from existing syllabus)

   (I)     Language of Science

   (II)    Desalination or Desalting Process

   (III)   Safety Practices

   (Iv)   Non-conventional Sources    of Energy

   (v)     Our Environment vi Entrepreneurship

Writing summary, moral and characterization of any one story from the book prescribed.

•    **(12 HOURS)**

## MODULE -3

## BUSINESS COMMUNICATION (One question with internal choice)

               Principles of     effective business

Correspondence Its parts, mechanics, styles and forms

Application for job, Bio-Data and C.V.

Letter of Enquiry

Placing order

Complaint **(12 HOURS)**

## MODULE -4

## COMPOSITION & TRANSLATION

Writing paragraphs of 150 words on topics of importance of computers, importance of communication skill, importance of science and technology etc.

Translation (Hindi to English and vice- versa). **(12 HOURS)**

## MODULE -5

### UNSEEN PASSAGES & PRECIS WRITING

i       Answer the questions based on the passage.

ii      Give suitable title OR

iii     Writing Précis **(12 HOURS)**

## OUTCOME:

The students acquired proficiency in below mentioned:

- Basic grammar and vocabulary

- Phonetic symbols pronunciation

- Listing skills

- Reading skills

- Writing skills

- Speaking skills

- Oral presentation.

## LIST OF EXPERIMENT

1.      Basic Grammar & Vocabulary (Synonyms /Antonyms, Analogies, sentence completion, correctly spelt words, idioms, proverbs, common errors).

2.      phonetic symbols and pronunciation.

3.      Listening skills (Including Listening Comprehension )3

4.      Reading Skills (Including Reading Comprehension )

5.      Writing Skills (Including structuring resume and cover letter )

6.      Speaking Skills

7.      Body Language

8. Oral Presentation : Preparation and delivery using audio – visual aids with stress n body language and voice modulation (Topic to be selected by the teacher.) Final Assessment Should be based on Assignment, presentation and interview.

NAME OF OURSE: **COMMUNICATIONSKILLS**
SUBJECT CODE: **DE 21**

**REFERENCES**

1. English Conversation Practice -Grant Taylor

2. Practical English Grammar    -Thomson & Martinet

3. Communication Skills for Technical Students Book – I,

4. Book – II -M/S Somaiya Publication, Bombay

5. Living English Structure S. Allen

6. English Grammar, Usage, and Composition

7. Tickoo & Subramanian, S. Chand & Co. Standard Allen Longman.

8. Essentials of Business Communication

9. Dr. Rajendra Pal & J.S. Korlahalli S.Chand & Sons, New Delhi.

10. Effective Business Communication

11. M.V. Rodriques, Concept Pub. Co., New Delhi.

12. Communication for Business

13. Shirely Taylor, Longman, England.

14. Communication for Engineers and Professors

15. P. Prasad, S.K.Kataria and sons publications, New Delhi

16. Technical English Book-II,    -Somaya Publications, New Delhi

NAME OF OURSE: **ENGINEERING MATHEMATICS**
SUBJECT CODE: **DE 22**

**TOTAL-60 HOURS**

**OBJECTIVE:**

Acquire knowledge of mathematical terms, concepts, principles and different methods. Develop the ability to apply mathematical methods to solve technical problems, to execute management, plans with precision. Acquire sufficient mathematical techniques necessary for daily and practical problems.

**MODULE -1**

**Function and Limit**

**Function**

Definitions of variable, constant, intervals such as open, closed, semi-open etc. Definition of Function, value of a function and types of functions, Simple Example

**Limits**

Definition of neighborhood, concept and definition limit functions with simple examples. Limits of algebraic, trigonometric, exponential and logarithmic functions with simple examples. **(15 HOURS)**

**MODULE -2**

**Derivatives**

Definition of Derivatives, notations, Derivatives of Standard Functions, Rules of Differentiation. (Without proof). Such as Derivatives of Sum or difference, scalar multiplication, Product and quotient. Derivatives of inverse and inverse trigonometric functions. Derivatives of Implicit Function Logarithmic differentiation, Derivatives of parametricFunctions.Derivatives of one function w.r.t another function Second order Differentiation. **(15 HOURS)**

**MODULE -3**

**Statistics And Probability Statistics**

Measures of Central tendency (mean, median, mode) for ungrouped and grouped frequency distribution. Graphical representation (Histogram and Ogive Curves) to find mode and median Measures of Dispersion such as range, mean deviation, S standard Deviation, Variance and coefficient of variation. Comparison of two sets of observations.

**Probability**

Definition of random experiment, sample space, event, Occurrence of event and types of events (impossible, mutually exclusive, exhaustive, equally likely).Definition of Probability, addition and multiplication theorems of Probability**(15HOURS)**

**NOTE: Chapter 4 is for Civil, Electrical, Electronic and Mechanical Groups**

**MODULE -4**

**Applications of Derivative**

Geometricalmeaningof Derivative,Equationoftangentand Normal

Rates and Motion

Maxima and minima

Radius of Curvature

**Complex number**

Definition of Complex number. Cartesian, polar, Exponential forms of Complex number. Algebra of Complex number (Equality, addition, Subtraction, Multiplication and Division) De-Moivre's theorem (without proof) and simple problems. Euler's form of Circular functions, hyperbolic functions and relations between circular &hyperbolic functions. **(15 HOURS)**

**OUTCOME:**
The student acquired proficiency in the below mention:

- Function and limit
- Derivatives of implicit function etc.
- Statistics and probability
- Complex number
- Numerical solution of algebraic equations and simultaneous equations.

**TEXT BOOKS**

Robert T Smith          -Calculus: Single Variable-Tata McGraw Hill

Dass H.K.               -Advanced Engineering Mathematics - S.ChandPublication,NewDelhi

S.CGuptaandKapoor -FundamentalsofMathematicalStatistics-S.ChandPublication,NewDelhi

B.SGrewal               -Higher Engineering Mathematics - Khanna Publication, New Delhi

P. N. Wartikar          -Applied mathematics - Pune Vidyarthi Griha Prakashan,Pune.

| Tutorial No. | Topic on which tutorial is to be conducted |
|---|---|
| **1.** | Function |
| **2.** | Limit |
| **3.** | Derivative |
| **4.** | Derivative |
| **5.** | Derivative |
| **6.** | Statistics |
| **7.** | Statistics |
| **8.** | Statistics |
| **9.** | Probability |
| **10.** | Probability |
| **11.** | Application of derivative / numerical solution of algebraic equation |
| **12.** | Application of derivative / numerical solution of algebraic equation |
| **13.** | Complex number/numerical solution of simultaneous equations |
| **14.** | Complex number/numerical solution of simultaneous equations |

NAME OF OURSE: **APPLIED SCIENCE (MECHANICAL) )**
SUBJECT CODE: **DE 23**

**TOTAL-60 HOURS**

**OBJECTIVE:**

The students are able to:

- Differentiate kinetic and kinematics and solve the problems on kinematics and kinetics.
- Graphically represent rectilinear motion.S.H.M. And use for solving engineering problems.
- Use N.D.T. In quality assurance and saving of man power, machining, materials.
- Use principles of illumination for enhancing work efficiency.
- Analyze variation of sound intensity with respect to distance.
- Identify different factors affecting indoor lighting.

**MODULE -1**

**Kinematics**

**Rectilinear Motion**

Equations of Motions -$v=u+a\,t$ , $s=ut+1/2at^2$, $V^2=u^2+2as$ (only equation), Distance Traveled by particle in $n^{nt}$ second, Velocity Time Diagrams -uniform velocity, uniform Acceleration and uniform retardation, equations of motion for motion under gravity.

**Angular Motion**

Definition of angular displacement, angular velocity, angular acceleration, Relation between angular velocity and linear velocity, Three equations of circular motion (no derivation) angular distance traveled by particle in $n^{nt}$ second (only equation), Definition of S.H.M. and S.H.M. as projection of uniform circular motion on any one diameter, Equation of S.H.M. and Graphical representation of displacement ,velocity, acceleration of particle in S.H.M. for S.H.M. starting from mean position and from extreme position.

**(15 HOURS)**

**MODULE -2**

**Kinetics**

Definitions of momentum, impulse, impulsive force, Statements of Newton's laws of motion and with equations,Applications of laws of motion —Recoil of gun, Motion of two connected bodies by light inextensible string passing over smooth pulley, Motion of lift.

**Work, power, Energy**

Definition of work, power and energy, equations for P.E. K.E., Work energy principle, Representation of work by using graph, Work do ne by a torque (noderivation). **(15 HOURS)**

## MODULE -3

### Non –destructive testing of Materials.

Testing methods of materials -Destructive and Nondestructive, Advantages and Limitations of N.D.T., Names of N.D.T. Methods used in industries, Factors on Which selection of N.D.T. dependents, Study of Prin Working, Advantages, limitations, Applications and Application code, Ultrasonic, Thermography. **(15 HOURS)**

## MODULE -4

### Acoustics and Indoor Lighting of Buildings

### Acoustics

Weber and Fetcher's law, limit of intensity and loudness, echo, Reverberation and reverberation time (Sabine's formula) **,**Timbre (quality of sound), Pitch or Frequency of sound. Factors affecting Acoustical planning of auditorium -- echo, reverberation, creep, focusing, standing wave, coefficient of absorption, sound insulation, noise pollution and the different ways of controlling these factors.

### Indoor lighting

Definition of luminous intensity, intensity of illumination with their SI units, Inverse square law and Photometric equation, Bunsen's photometer — ray diagram, working and applications, Need of indoor lighting ,Indoor lighting schemes and Factors Affecting Indoor Lighting. **(15 HOURS)**

### OUTCOME:

The students exposed to below mention:

- Determination of simple harmonic motion
- Application of laws of motion
- Non destructive testing of materials
- Accosting and indoor lighting buildings.

## EXPERIMENTS

1. To represent simple harmonic motion with the help of vertical oscillation of spring and to determine spring constant (K) (Stiffness Constant)

2. To determine time period of oscillation of compound bar pendulum and calculate acceleration du e to gravity.

3. To determine the velocity of sound by using resonance tube

4. To compare luminous intensities of two luminous bodies  by using Bunsen's photometer.

5. To determine Joule's constant (J) by electric method

6. To determine wavelength of Sodium light by using Newton's rings

7. To determine frequency of sound by using sonometer **.**

8. To calculate refractive index of material of prism using spectrometer device .

| Text Books: | | |
|---|---|---|
| Name of Authors | Titles of the Book | Name of the Publisher |
| V. Rajendran | Physics-I | Tata McGraw - Hill |
| Arthur Beiser | Applied physics | Tata McGraw - Hill |
| R.K.Gaur and S.L.Gupta | Engineering Physics | Dhanpatrai |

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NAME OF COURSE: **ENGINEERING MECHANICS**
SUBJECT CODE: **DE 24**

**TOTAL-60 HOURS**

**OBJECTIVE:**
The students will able to:

- Resolve the forces

- Find the resultant of given force system

- Find the reactions of beam.

- Find the centre of gravity of composite solids.

- Find M.A, V.R Efficiency and establish law of machine**.**

## MODULE -1

### COMPOSITION AND RESOLUTION OF FORCES

Definition, Effect, characteristics of force System of Forces Principle of Transmissibility of Forces

Concept of Resultant Force Law of –Parallelogram of Forces Triangle of Forces Polygon of Forces.

Determination of Resultant of two or more concurrent forces (analytically and graphically)

**(06 HOURS)**

## MODULE-2

### PARALLEL FORCES AND COUPLES

Classification of Parallel Forces Methods of finding resultant Force of parallel forces- analytically &

graphically Position of resultant force of parallel forces Definition, Classification and characteristics

of a force Couple, moment of couple. **(06 HOURS)**

## MODULE -3

### MOMENTS AND THEIR APPLICATIONS

Definition, Types and law of moment Varignon's Principle of moment and its

Applications Lever and its Applications. Types of supports and determination of support reactions of

a simply supported beam subjected to point load and uniformly distributed load (UDL). **(06 HOURS)**

## MODULE -4

### EQUILIBRIUM OF FORCES

Equilibrium of a system of concurrent forces Conditions and types of Equilibrium Lami's Theorem

and its applications. **(06 HOURS)**

## MODULE -5

### CENTRE OF GRAVITY

Difference between Centroid and Center of Gravity (CG) Centroid of standard plane figures and CG

of simple solid bodies Method of finding out Centroid of composite plane laminas and cut sections

Method of finding out CG of Composite solid. **(06 HOURS)**

## MODULE -6

**FRICTION:** Concept and types of friction Limiting Friction, coefficient of friction, angle of friction, angle of repose Laws of friction ( Static and Kinetic) Analysis of equilibrium of Bodies.

**(06 HOURS)**

## MODULE 7

## SIMPLE LIFTING MACHINES

Concept of lifting Machines Definition of Mechanical Advantage, Velocity n. Ratio and Efficiency of Machines and their relation Reversibility of Machines and condition for self locking machine Law of Machines, Maximum mechanical advantage and maximum efficiency of machine Friction in machine ( In terms of Load and effort) Calculation of M.A., V.R. and efficiency of following machines: Simple wheel and axle Differential wheel and axle Single purchase crab and Double purchase crab Simple screw jack and Different System of simple pulley blocks. **(06 HOURS)**

## MODULE -8

## MOTION OF A PARTICLE

Definition of speed, velocity, acceleration, uniform velocity, uniform acceleration and variable acceleration Motion under constant acceleration/ retardation (equations of motion) Motion under force of gravity Concept of relative velocity Definition of projectile, velocity of projection angle of projection, time of light, maximum height, horizontal range and their determination Definition of angular velocity, angular acceleration and angular displacement Relation between linear and angular velocity of a particle moving in a circular path Motion of rotation under constant angular acceleration. **(06 HOURS)**

## MODULE -9

## LAWS OF MOTION

Newton's Laws of motion and their applications. **(06 HOURS)**

## MODULE -10

## WORK, POWER AND ENERGY

Definition unit and graphical representation of work Definition and unit of power and types of engine power and efficiency of an engine. Definition and concept of Impulse Definition, unit and types of energies.Total energy of a body falling under gravity. **(06 HOURS)**

## OUTCOME:

The students' understand the below mentioned i.e.:

- Verification of law of triangle of forces and lami's theorem

- Verification of law of parallelogram of forces.

- Determination of moment of inertia of fly wheel.

- Determination of coefficient of friction between two given materials.

- Determination of forces in the members of jib crane

## LIST OF EXPERIMENTS

1. To verify the Law of triangle of forces and Lami,s theorem.

2. To verify the Law of parallelogram of Forces.

3. To determine the moment of inertia of fly wheel by falling weight method.

4. To determine the coefficient of Frication between two given materials by inclined plane.

5. Determination of forces in the members of jib Crane.

## REFERENCES

1.    A text book of Applied Mechanics – R.S. Khurmi , S.C.
      Chand & Co. , New Delhi

2.    Applied Mechanics – I.B. Prasad, Khanna Publishers, New Delhi

3.    Applied Mechanics ( Hindi) – R.S. Jog, Anand Publishers, Gwalior

4.    Applied Mechanics ( Hindi) – A.R. Page, Deepak Prakashan, Gwalior

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NAME OF COURSE:**BASIC CHEMISTRY**

SUBJECT CODE: **DE 25**

**TOTAL-60 HOURS**

**OBJECTIVE:**

- To draw the atomic structure of different elements.

- To represent the formation of molecules schematically

- To describe the mechanism of electrolysis.

- To identify the properties of metals and alloys related to engineering applications.

- To identify the properties of non metallic materials, related to engineering applications.

- To compare the effects of pollutants on environments & to suggest preventive measures & safety.

**MODULE- 1**

**ATOMIC STRUCTURE AND RADIO ACTIVITY**

Discovery of electron, proton, neutron and nucleus. Ruther ford's and Bohr's model of an atom. Bohr Burry scheme of filling the electrons in various orbits. Idea of s,p,d,f orbital .Alfa, Gamma and Beta rays, theory of radio activity, Group displacement law, half life period, numerical problems on half life period, fission and fusion. **(05 HOURS)**

**MODULE -2**

**SURFACE CHEMISTRY AND ITS APPLICATION**

True solution, colloidal solution and suspension,youphobic and lyophillic colloids, optical and electrical properties of colloids, coagulation, coagulants, idea about gels and emulsions.

**(05 HOURS)**

**MODULE -3 ELECTROCHEMIS TRY**

Electrolysis, Faraday's laws of electrolysis, Numerical problems on Faradays Law, Electroplating of copper and nickel. **(05 HOURS)**

**MODULE -4**
**COLLIGATIVE PRPOPERTIES**

Osmosis & osmatic pressure, Relative vapour pressure and Routls law. Internal energy (enthalpy) Entrophy, Entrophy fusion free energy, Effect of change in temperature catalysis. **(05 HOURS)**

**MODULE -5**.

**CHEMICAL BONDING AND CATALYSIS**

Bonding: Nature of bonds- Electrovalent, Co-valent, co-ordinate and hydrogen bond. Catalysis: Types , theory characteristic, positive , negative, auto and induced catalyst. Catalytic Promoter and catalytic inhibitors. Industrial Application of catalysis plastics, Compounding and Moulding

constituents.**(05HOURS)**

## MODULE -6

### WATER

Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful – effects of hard water in boiler. Municipal water supply.Numerical on soda lime process. Determination of hardness of water by O. Hener's, EDTA and soap solution method. **(05 HOURS)**

## MODULE -7

### METALS AND ALLOYS

Physical and chemical properties of metals, copper, iron, aluminum, tin, nickel. General principal of metallurgy, minerals/ ores, ore dressing, roasting, smelting, bassemerisation, fluxes, purification. Explanation of alloying purposes, methods of alloying, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloy. **(05 HOURS)**

## MODULE -8.

### IONIZATION, PH VALUE CORROSION AND PROTECTION

Arrhenius theory of ionization, factors affecting ionization.pH meaning (numerical),Buffer solutions and Buffer actions, choice of indication (acidimetry and alkalimeter). Explanationof corrosion, types of corrosion, factors effecting corrosion, corrosion control (protection against corrosion), metal and organic coating for corrosion control. **(05 HOURS)**

## MODULE -09
### GLASS, CEMENT AND REFRACTORY

### GLASS:

Basic raw materials for glass, composition and manufacture of glass, varieties of glass and annealing of glass,.

### CEMENT :

Constituting compounds in cement, Composition of Portland Cement, its manufacture, setting and hardening of cement.

**REFRACTORIES** : Meaning, characteristics , use of common refractory materials. Polymerization and condensation, classification of plastics, Compounding and Molding constituents of plastics. **(05 HOURS)**

## MODULE -10
### HIGH POLYMERS, RUBBER AND INSULATORS
Preparation Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters, Bakelite.

Synthetic fibers –nylon, rayon, decron, and polyesters. Definition characteristics, classification and properties of insulators. Glass, wool and thermocole.I dea about rubber and vulcanization. **(05 HOURS)**

## MODULE -11

## LUBRICANTS, PAINTS AND VARNISHES

Lubricants: Meaning, type and theory of lubricants, properties of a good lubricants, Flash and fire point and cloud point, emulsification number, viscosity. Paints and Varnishes: Meaning, ingredients and characteristics of good paints and varnishes, their engineering applications. **(05 HOURS)**

## MODULE -12

## FUELS, FIRE EXTINGUISHERS AND EXPLOSIVES

Classification of fuel, gross and net calorific value, Determination of a solid fuel by bomb calorimeter , octane and octane number. Proximate analysis of fuel, its utility, crude petroleum, products of fractional distillation .Fire extinguishers – Description and use. Explosives – Meaning, types, characteristic and use of explosives. Name Dynamite, lead azide, T.N.T., Picric acid, R.D.X.. **(03 HOURS)**

## MODULE -13

## POLLUTION AND CONTROL

Introduction and chemical toxicology, air and water pollution, control of air and water pollution. Harmful effect of different gases like carbon mono-oxide, carbon dioxide, sulphur dioxide, nitric oxide, nitrous and lead. **(02 HOURS)**

**OUTCOME:**
The student understands the below mentioned:

- Identification anion and cation
- Determination of flash point & fire point & viscosity.
- Determination of strength, hardness of water, solid content of water
- Determination of percentage of moisture in coal.

### LIST OF EXPERIMENT

1. To identify one Anion and Cation in a given sample.
2. Determination of flesh point and fire point of a given sample of oil by Abel's apparatus.
3. Determination of viscosity by Red Wood Viscometer no.1 and no.2.
4. Redoximetry Titration :
**4.** Percentage of Iron in given sample of alloy.

   -Determination of strength of ferrous ammonium sulphate.

   -Determination of strength of ranhydrous ferrous sulphate and ferrous sulphate.
**5.** Determination of hardness of water by :

a). EDTA Method and Soap Solution Method

**6.** Determination of solid content in the given sample of water.

5. Determination of percentage of moisture in the given sample of coal by proximate analysis.

## REFERENCES

1. PHYSICAL CHEMISTRY – BAHL AND TULI

2. INORGANIC CHEMISTRY – SATYAPRAKASH

3. MODERN TEXT BOOK OF APPLIED CHEMISTRY – DR. G. C. SAXENA, JAIN PRAKASHAN, INDORE

4. APPLIED CHEMISTRY - DR. G. C. SAXENA, DEEPAK PRAKASHAN, GWALIOR

5. APPLIED CHEMISTRY -SHRIVASTAVA & SINGHAL, PBS PUBLICATION, BHOPAL

6. ENGINEERING CHEMISTRY -UPPAL

7. ENGINEERING CHEMISTRY -RAO AND AGARWAL

8. ENGINEERING CHEMISTRY -P.C. JAIN

9. POLYMER CHEMISTRY -O.P. MISHRA

10. APPLIED CHEMISTRY H.N. SAHNI,DEEPAK PRAKASH

NAME OF COURSE: **DEVELOPMENT OF LIFE -I**

SUBJECT CODE: **DE 26**

**TOTAL-60 HOURS**

**OBJECTIVE:**

The student will be able to:

- Develop reading skills

- Use techniques of acquisition of information from various source

- Draw the notes from the text for better learning.

- Apply the techniques of enhancing the memory power.

- Develop assertive skills.

- Prepare report on industrial visit.

- Apply techniques of effective time management.

- Set the goal for personal development.

- Enhance creativity skills

- Develop good habits to overcome stress.

- Face problems with confidence.

**MODULE -1 IMPORTANCE OF DLS,**

Introduction to subject, importance in present context, application. **(10 HOURS)**

**MODULE -2**

**INFORMATION SEARCH**

Information source –Primary, secondary, tertiary Print and non – print, documentary, Electronic Information center, Library, exhibition, Government Departments. Internet Information search – Process of searching, collection of data –questionnaire, taking Interview, observation method. **(10 HOURS)**

**MODULE – 3**

**WRITTEN COMMUNICATION**

Method of note taking Report writing –Concept, types and format. **(10 HOURS)**

**MODULE – 4 SELF ANALYSIS**

Understanding self —Attitude, aptitude, assertiveness, self esteem, Confidence buildings. Concept of motivation. **(10 HOURS)**

**MODULE – 5**

**SELF DEVELOPMENT**

Stress Management –Concept, causes, effects, and remedies to Avoid / minimize stress. Health

Management – Importance, dietary guidelines and exercises. Time management - Importance, Process of time planning, Urgent Vs importance, Factors leading to time loss and ways to handle it, Tips for effective time management. Emotion-concept, types, controlling, emotional intelligence. Creativity-concept, factors enhancing creativity. Goal setting – concept, setting smart goal. **(10 HOURS)**

## MODULE – 6

## STUDY HABITS

Ways to enhance memory and concentration. Developing reading skill.Organisation of knowledge.

**(10 HOURS)**

**OUTCOME:**

The students' develop their person ability by taking below mentioned task namely.

- Library search
- Select a topic for presentation
- Preparation of report on seminar
- Survey of people ,place of gather information
- Time management by drawing a routine
- Updating diary of gathering information
- Undergoing yoga and meditation

Model and methods of learning.

**Text Books**:

| Name of Authors | Titles of the Book | Name of the Publisher |
|---|---|---|
| Marshall Cooks | Adams Time management | Viva Books |
| E.H. Mc Grath S.J. | Basic Managerial Skills for All | Pretice Hall of India, Pvt Ltd |
| Allen Pease | Body Language | Sudha Publications Pvt. Ltd. |
| Lowe and Phil | Creativity and problem solving | Kogan Page (I) P Ltd |
| Adair, J | Decision making & Problem Solving | Orient Longman |
| Bishop , Sue | Develop Your Assertiveness | Kogan Page India |
| Marion E Haynes | Make Every Minute Count | Kogan page India |
| Pearson Education Asia | Organizational Behavior | Tata McGraw Hill |
| Michael Hatton (Canada – India Project) | Presentation Skills | ISTE New Delhi |

| -- | Stress Management Through Yoga and Meditation | Sterling Publisher Pvt Ltd |
|---|---|---|
| Richard Hale ,Peter Whilom | Target setting and Goal Achievement | Kogan page India |
| Chakravarty, Ajanta | Time management | Rupa and Company |
| Harding ham .A | Working in Teams | Orient Longman |

| **Suggested List of Assignments/ Tutorial :** | |
|---|---|
| **S.No** | **The Term Work Will Consist Of Following Assignments.** |
| 1 | Library search: - <br><br> Visit your Institute's Library and enlist the books available on the topic given by your teacher. <br><br> Prepare a bibliography consisting name of the author, title of the book, publication <br><br> and place of publication. |
| 2 | Enlist the magazines, periodicals and journals being available in your library. Select any one of them and write down i ts content. **Choose a topic for presentation.** |
| 3 | Attend a seminar or a guest lecture, listen it carefully and note down the important points and prepare a report of the same. |
| 4 | Visit to any one place like historical/ office/ farms/ development sites etc.   and gather information through observation, print resources and interviewing the people. |
| 5 | Prepare your individual time table for a week – <br><br> (b)   List down your dailyactivities. <br><br> (c)   Decide priorities to be given according to the urgency and importance of the activities. <br><br> (d)   Find out your time wasters and mention the corrective measures. |
| 6 | Keep a diary for your individual indicating - planning of time, daily transactions, collection of good thoughts, important data, etc |
| 7 | Find out the causes of your stress that leads tension or frustration .Provide the ways to Avoid them or to reduce them. |
| 8 | Undergo the demonstration on yoga and meditation and practice it. Write your own views, feeling and experiences on it. |
| **Note:-** These are the **suggested assignment** for guide lines to the subject teacher. However the subject teacherscanselect,designanyassignmentrelevanttothetopic,keepinginmindtheobjectivesof this subject. | |

NAME OF COURSE: **PROFESSIONAL PRACTICES**

SUBJECT CODE: **DE 27**

**TOTAL-60 HOURS**

**OBJECTIVE:**

The Students Will Be Able To:

- Acquire Information From Different Source

- Prepare Notes For Given Topic

- Present Given Topic in Seminar.

- Interact With Peers To Share Thoughts.

- Prepare a Report on Industrial visit, Expert Lecture.

**MODULE -1**

**INDUSTRIAL VISITS:**

Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form part of the term work.

Visits to any two of the following:

i) Nearby Petrol Pump.(fuel, oil, product specifications)

ii) Automobile Service Station (Observation of Components / aggregates)

iii) Engineering Workshop(Layout, Machines)

iv) Dairy Plant / Water Treatment Plant **(15 HOURS)**

**MODULE -**2

Lectures by Professional / Industrial Expert / Student Seminars based on information search to be organized from any THREE of the following areas :

i) Pollution control.

ii) Non destructive testing.

iii) Acoustics.

iv) Illumination / Lighting system.

v) Fire Fighting / Safety Precautions and First aids.

vi) Computer Networking and Security.

vii) Topics related to Social Awareness such as – Traffic Control System, Career opportunities, Communication in Industry, Yoga Meditation, Aids awareness and health awareness. **(15 HOURS)**

**MODULE -3**

**GROUP DISCUSSION:**

The students should discuss in a group of six to eight students and write a brief report on the same as a

part of term work. Two topics for group discussions may be selected by the faculty members. Some of the suggested topics are –

i) Sports

ii) Current news items

iii) Discipline and House Keeping

iv) Current topics related to mechanical engineering field. **(15 HOURS)**

## MODULE -4

### STUDENT ACTIVITIES:

The students in a group of 3 to 4 will perform any one of the following activities (others similar activities may be considered. **(15 HOURS)**

### ACTIVITY:

i)Collect and study IS code for Engineering Drawing..

ii) Collecting information from Market: Nomenclatures and specifications of engineering materials.

iii) Specifications of Lubricants.

iv) Draw orthographic projections of a given simple machine element using and CAD software.

### OUTCOME:

The students are exposed to below mention

• Industrial visits and preparation of report

• Lectures by experts on yoga ,meditation and health awareness

• Group discussion on sports, discipline and current topics on mechanical engineering

• Student's activities on collection of  IS codes for engineering drawing, specification of lubricants.