

COURSE OBJECTIVES:

1. To provide knowledge on solving ordinary differential equations.
2. To provide knowledge on applications of first order ordinary differential equations.
3. To provide knowledge on solving higher order ordinary differential equations.
4. To provide knowledge on solving partial differential equations.
5. To provide knowledge on curve fitting, correlation and regression lines.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. Understand methods of solving first order differential equations.
2. Understand some physical applications of first order differential equations.
3. solve higher order differential equations.
4. solve partial differential equations.
5. understand the relation between two variables by Curve fitting.

UNIT I**(12)****Differential Equations of First Order :**

Definition - Formation of differential equation - Equations of first order and first degree : Linear equations, Bernoulli's equation.

Exact differential equations - Equations reducible to exact equations.

UNIT II**(12)**

Applications of differential equations of first order : Orthogonal trajectories, Newton's law of cooling, Growth and decay problems.

Higher order Linear Differential Equations : Definitions - Operator D - Rules for finding the complementary function.

UNIT III**(12)**

Inverse operator - Rules for finding Particular Integral - working procedure. Method of variation of parameters.

Equations reducible to linear equations with constant coefficients : Cauchy's and Legendre's Linear equations.

UNIT IV**(12)****Partial Differential Equations :**

Formation - Equations solvable by direct integration - Linear equations of first order- Lagrange's linear equation.

Linear Homogeneous partial differential equations of higher order with constant coefficients.

UNIT V**(12)**

Statistics : Method of least squares - Fitting of straight line and parabola.

Correlation, Co-efficient of correlation (direct method), Lines of regression.

LEARNING RESOURCES:

TEXT BOOK(s):

B.S.Grewal - Higher Engineering Mathematics, Khanna publishers, 40th edition, 2007.

REFERENCE BOOK(s):

Erwin Kreyszig - Advanced Engineering Mathematics, 8th edition, New Age International (P) Ltd., 2007.

WEB RESOURCES:

<http://nptel.iitm.ac.in/courses/>

EC/CE/ChE/CS/
EE/IT/ME-102

ENGINEERING PHYSICS

L T P C
4 - - 3

COURSE OBJECTIVES:

1. To impart knowledge and understanding of basic principles of Ultrasound and its applications in imaging and industry
2. To understand about basic phenomena of light waves.
3. To understand about fundamentals of Laser, its types and applications. 3-D photography , principle and applications of optical fiber..
4. To understand Essential formulation of physics in the micro world.
5. To understand development of Electromagnetic wave equations.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

1. understand the concepts of Ultrasonic waves, production and applications in NDT.
2. understand the interference in thin films and its application, Concept of diffraction and grating, birefringence and production and detection of different polarized lights.
3. acquire Knowledge on basics of lasers, holography, fibers and their applications.
4. understand Schrodinger wave equation and its applications in 1-D with respect to the domain of quantum world.
5. describe the nature of electromagnetic radiation and matter in terms of the particles.

UNIT I

(12)

Ultrasonics : properties, production of ultrasonics by magnetostriction, piezo electric oscillator methods, detection by acoustic grating method, General applications of ultrasonics in industry and medicine.

NDT: Normal beam pulse echo testing, Ultrasonic scanner (A & B modes).

UNIT II

(12)

Physical Optics : Interference: Introduction, Stoke's principle (change of phase on reflection), interference in thin films due to reflected light (Cosine law), theory of air wedge (fringes produced by a wedge shaped thin film), theory of Newton's rings(reflected system).

Diffraction: Introduction, Fraunhofer diffraction due to a single slit (quantitative), theory of plane transmission diffraction grating.

Polarization: Introduction, double refraction, construction and working of a nicol prism, quarter wave plate, production and detection of circular and elliptical polarizations(qualitative).

UNIT III

(12)

Lasers : characteristics, spontaneous and stimulated emissions, Einstein coefficients and Relation between them, population inversion, pumping, active system, gas (He-Ne) laser, Nd: YAG laser and semiconductor (GaAs) laser, applications of lasers.

Holography: basic principle, recording, reproduction and applications.

Fiber optics: Principle & structure of an optical fiber, numerical aperture, acceptance angle and acceptance cone, fractional index change, types of optical fibers, fiber optics in communication system and its advantages. Applications of optical fibers.

UNIT IV

(12)

Principles of Quantum Mechanics : de Broglie's concept of matter waves, Davisson and Germer experiment, Heisenberg's uncertainty principle-experimental verification (electron diffraction - single slit)

Schrodinger equation and application : Time independent Schrodinger's wave equation, physical significance of the wave function, particle in a box (one dimensional), tunneling effect, expression for transition probability (Qualitative treatment).

UNIT V**(12)**

Electromagnetism : induced electric fields, displacement current and conduction current, Maxwell's equation - qualitative (differential & integral forms) - significance, velocity of electromagnetic wave equation in free space, Poynting Theorem, LC oscillations (quantitative).

LEARNING RESOURCES:**TEXT BOOK(s):**

1. M.N.Avadhanulu & P.G. Kshirasagar - Engineering Physics, S.Chand & Co.Ltd.
2. V. Rajendran - Engineering Physics

REFERENCE BOOK(s):

1. Resnick & Halliday - Fundamentals of Physics, John Wiley sons.
2. SL Kakani & Shubhra kakani - Engineering Physics, 3rd Edition, CBS Publications Pvt. Ltd. Delhi.
3. B. K. Pandey & S. Chaturvedi - Engineering Physics, Cengage Learning India Pvt. Ltd., Delhi.
4. Hitendra K. Malik & A.K.Singh - Engineering Physics, TMH, New Delhi.
5. P.K.Palanisamy - Engineering Physics, Scitech Publications.

WEB RESOURCES:

<http://nptel.iitm.ac.in/courses/>

EC/CE/CS/
EE/IT/ME-103

APPLIED CHEMISTRY

L T P C
4 - - 3

COURSE OBJECTIVES:

1. To know the softening methods and quality parameters of water used in industries.
2. To know the requirements and purification methods of drinking water.
3. To understand the construction and functioning of electrochemical energy systems.
4. To study the mechanisms, types, factors influencing corrosion and protection methods of corrosion.
5. To acquire knowledge on latest analytical techniques.

COURSE OUTCOMES:

After successful completion of the course, the students will be able to

1. acquire knowledge on quality and utility of water in industries.
2. gain knowledge on water treatment for drinking purpose.
3. understand functioning of electrochemical energy systems.
4. relate corrosion and environment and suggest methods to prevent corrosion.
5. analyse substances using techniques like Spectrophotometry, Colorimetry, Conductometry and Potentiometry.

UNIT I

Text Book - 1 (12)

Water technology: Types of Hardness - units and determination by EDTA method (simple problems), Water technology for industrial purpose: Boiler troubles- scales, sludges, caustic Embrittlement, boiler corrosion, priming and foaming - causes and prevention.

Internal conditioning - phosphate, calgon and carbonate treatment. External conditioning-lime soda process (simple problems), softening by ion exchange process. Desalination of brackish water by electro dialysis and reverse osmosis.

UNIT II

Text Book - 1 (12)

Water treatment for drinking purpose - WHO guidelines, sedimentation, coagulation, filtration (slow sand filter), various methods of chlorination, breakpoint chlorination.

Phase Rule: Statement and explanation of the terms involved, one component water system, condensed phase rule - construction of phase diagram by thermal analysis, simple eutectic system (Pb-Ag system only), applications eutectic compounds.

UNIT III

Text Book - 1 (12)

Electrochemistry: Electrode potential, electrochemical series and its significance, Nernst equation - derivation - related problems, Reference electrodes (SHE and Calomel electrode) Ion-selective electrode - glass electrode and measurement of pH.

Electrochemical Energy Systems: Types of electrochemical energy systems, electrochemistry of primary batteries (Lachlanche or dry cell), Secondary cells (Lead Acid cell, Ni-Cd cell), Lithium batteries (Li-MnO₂, Lithium organic electrolyte) and their advantages. Fuel cells (Oxygen-Hydrogen).

UNIT IV

Text Book - 1 (12)

Corrosion and its control: Introduction, dry corrosion, electrochemical theory of corrosion, Types of corrosion- differential aeration, galvanic (galvanic series) and Stress corrosion Factors affecting corrosion-design, pH, over voltage and temperature.

Protection methods: Cathodic protection, (Impressed current and sacrificial anode) corrosion inhibitors - types and mechanism of inhibition, metallic coatings - Galvanization, Tinning, Electroplating (Cu) and electro less plating (Ni)

UNIT V*Text Book - 1,2 (12)*

Analytical Techniques: Spectroscopy- Beer-Lambert's law, UV-electronic transitions - chromophores - auxochromes - shifts, and IR- modes of vibrations, ex. H_2O , CO_2 Instrumentation of UV and IR.

Colorimetry - estimation of Iron, Conductometric (HCl vs NaOH) and potentiometric titrations ($Fe(II)$ vs $K_2Cr_2O_7$).

LEARNING RESOURCES:**TEXT BOOK(s):**

1. Engineering Chemistry, P.C. Jain and Monika Jain, 15th Edition, 2008, Dhanpat Rai Publishing Company, New Delhi.
2. A Text Book of Engineering Chemistry, Shashi Chawla, 3rd Edition, 2009, Dhanpat Rai and Co.(P) Ltd., New Delhi.

REFERENCE BOOK(s):

A Text Book of Engineering Chemistry, S.S. Dara and S.S. Umare, 12th Edition, 2010, S.Chand and Co.Ltd.

WEB RESOURCES:

1. <http://www.powerstream.com/BatteryFAQ.html#lec>
2. <http://freevideolectures.com/Course/3029/Modern-Instrumental-Methods-of-Analysis>
3. http://www.cdeep.iitb.ac.in/webpage_data/nptel/Core%20Science/Engineering%20Chemistry%201/

COURSE OBJECTIVES:

1. To give a comprehensive insight into natural resources, ecosystems and bio diversity.
2. To create an awareness on various aspects of environmental pollution and effects.
3. To educate the ways and means to protect the environment from pollution.
4. To impart fundamental knowledge on human welfare and environmental acts.
5. To demonstrate the environmental problems like global warming, ozone layer depletion, acid rains.

COURSE OUTCOMES:**After successful completion of the course, the students are able to**

1. define and explain the basic issues concerning the ability of the human community to interact in a sustainable way with the environment.
2. describe and discuss the environmental implications of biologically important materials through the ecosystems.
3. describe and discuss the environmental pollution implications and watershed management.
4. discuss the benefits of sustaining each of the following resources - food, health, habitats, energy, water, air, soil and minerals.
5. understand the causes, effects and controlling measures of different types of environmental pollutions with some case studies.

UNIT I**(12)**

Introduction: Definition, Multidisciplinary nature, Scope and Importance of environmental studies
Natural Resources: Forest Resources: Use and over-exploitation, Deforestation, Effects of Mining and Big dams on forests and tribal people.

Water Resources: Use and over-utilization of surface and groundwater, floods and droughts, Water logging and salinity; Conflicts over water. **Energy resources:** Renewable and non-renewable Energy sources; Land as a resource, land degradation, Soil erosion & Desertification.

UNIT II**(12)**

Ecosystems: Definition, Structure and functions of Ecosystems, a general account of types of ecosystems with examples. Bio-geo chemical cycles (water, carbon, and nitrogen).

Biodiversity and its Conservation: Definition of Biodiversity, Values and threats to biodiversity and conservation of biodiversity. Bio-geographical classification of India, India as a mega-diversity nation, Hot-spots of biodiversity, IUCN classification of Biodiversity; Endemic, Exotic and Endangered species - Meaning with a few examples from India.

UNIT III**(12)**

Environmental Pollution: Causes, effects and control measures of Air pollution including Noise, Fresh Water pollution, Marine pollution, Thermal pollution, and nuclear pollution. Solid wastes - Types based on source (Ex. municipal, industrial, constructional and medical) and nature (degradable and non-degradable); Effects of improper dumping. Solid waste management - Objectives, practices.

Water shed and its management: Definition and importance; Water shed management methods including rain water harvestment.

UNIT IV**(12)**

Social Issues and Environment: Definition of sustainable development, key types and measures for sustainable development; salient features of Stockholm conference 1972, Earth summit, 1992; Human Population and environment, Green revolution, Resettlement and rehabilitation of people - problems and concerns.

Climate Changes: Green House Gases, Kyoto Protocol, Global warming (The story of Tuvalu); Ozone depletion and Acid rain; Environmental Impact Assessment.

UNIT V**(12)**

Environmental acts: Environmental Legislation; Wild life protection act, 1972; Water(Prevention and Control of pollution) act, 1974; Forest Conservation act, 1980; Air (Prevention and Control of pollution) act, 1981; Environmental protection act, 1986.

Case Studies: Chipko movement, Narmada Bachao Andolan, Silent Valley Project, Chernobyl Nuclear Disaster, Bhopal Tragedy, Ralegaon Siddhi, The story of Ganga.

Field work:

Visit to a local area to document environmental assets - river / forest / grassland / hill / mountain.

Study of local environment-common plants, insects, birds.

Study of simple ecosystems - pond,river, hill, slopes etc.

Visits to industries, water treatment plants, and effluent treatment plants.

LEARNING RESOURCES:**TEXT BOOK(s):**

1. Anubha Kaushik and C.P.Kaushik - Environmental Studies, 3rd Edition, New Age International Publishers, New Delhi., 2012.
2. R. Rajagopalan - Environmental studies from crisis to cure, 3rd Edition, Oxford University press, 2012.

REFERENCE BOOK(s):

1. T Benny Joseph - Environmental Studies, Tata McGraw-Hill Publishing Company Limited, 2006.
2. G. Tyler Miller Jr. - Environmental Science, 3rd edition, CENGAGE Learning, New Delhi, 2011.

WEB RESOURCES:

1. <http://nptel.ac.in/120108004>
2. <http://nptel.ac.in/122102006>

EC-105

ELEMENTS OF MECHANICAL ENGINEERING

L T P C
4 1 - 3**COURSE OBJECTIVES:**

1. To study various types of force systems. To teach students the basic principles of mechanics of rigid bodies and to analyze problems in a simple and logical manner, To teach students to draw free body diagrams and equilibrium methods in problem solving.
2. To understand the basic manufacturing process like casting, welding and their working process.
3. To impart the knowledge about different drive systems like belts, belt drives, gears and gear trains. To improve knowledge on basic conventional machining processes.
4. To understand the basic concepts of thermodynamics and working principles of 2 stroke and 4 stroke petrol and diesel engines.
5. To understand the working principles of different boilers and different mountings and accessories used for the safety operation of boilers and basics about refrigeration and air conditioning.

COURSE OUTCOMES:**After successful completion of the course, the students will be able to**

1. understand different coplanar forces and determine the resultant forces. Simplify a system of forces and couples applied to a rigid body into a single resultant force and couple.
2. know about basic fabrication processes like welding, casting and their working.
3. know how the power is transmitted through belt and gear drives, estimate the tensions, power transmitted, length of the belt required etc. Know the various manufacturing process like foundry, welding, brazing, soldering, milling and drilling etc.,
4. know the basic concepts of thermodynamics, efficiencies and performance of 2-stroke and 4 stroke IC Engines
5. understand working principles of Babcock and Wilcox boilers, different mountings and accessories used in the boilers. They able to know basic working of refrigerator and air conditioning.

UNIT I*Text Book - 1 (13)*

Forces : Types of forces, Concurrent Forces, Resolution of coplanar Forces, Equilibrium of Coplanar forces, free body diagrams, Method of Moments.

Non Concurrent Forces in a Plane : Couple, equilibrium of parallel forces in a plane, resultant and equilibrium of general case of forces in a plane, plane trusses-method of joints.

UNIT II*Text Book - 2 (13)*

Casting : Steps involved in Casting, Applications metal casting, Pattern- Materials, Types of patterns, pattern allowances, casting defects.

Fabrication processes : Classification; Welding - Classification of welding; Electric arc welding - Principle of arc, Arc welding equipment, Electrodes, Manual metal arc welding, TIG welding (working principles)

Introduction to Machine Tools : Construction and working of Lathe.

UNIT III*Text Book - 3 (13)*

Power Transmission Methods and Devices : Belts : Belts, expression for the ratios of tensions on the slack and tight side, power transmitted, V-belts, chain drives.

Gears : Types of gears, Spur, helical, Bevel gears, nomenclature of gears, Gear manufacturing methods, (Simple problems on spur gears) gear trains- introduction.

UNIT IV*Text Book - 4 (13)*

Basic concept of thermodynamics : Introduction, States, Work, Heat, Temperature, Zeroth law, laws of thermodynamics, Classification of heat engines, Description and thermal efficiency of Carnot cycle, Otto cycle and Diesel cycle.

Internal Combustion Engines : Introduction, Classification Engine details, four-stroke/ two-stroke cycle Petrol/Diesel engines, Indicated power, Brake Power, Efficiencies. (Simple Problems)

UNIT V*Text Book - 4 (13)*

Steam Boilers : Introduction, Classification, Cochran, Babcock and Wilcox boiler, functioning of different mountings and accessories.

Refrigeration & Airconditioning : Introduction to refrigeration and air-conditioning, Coefficient of performance, Simple refrigeration vapour compression cycle, Domestic Refrigerator, Summer and winter Air conditioning.

LEARNING RESOURCES:**TEXT BOOK(S):**

1. Engineering Mechanics - A.K. Tayal, Umesh Publications, 13th Edition, New Delhi.
2. Workshop Technology - Vol I and II - Hazaraj Chowdary
3. Elements of Mechanical Engineering, Mathur, and Mehta, Jain Brothers, Delhi (2005)
4. Treatise on Heat Engineering - V. P.Vasandhani & Kumar, Metropolitan Publishers

REFERENCE BOOK(S):

1. Applied Mechanics & Strength of Materials, R. S. Khurmi, 13th Edition, S. Chand & Co. (1977)
2. Basic Mechanical Engineering, T.J.Prabhu & Others, 1st Edition, Scitech Publishers (2010)

WEB RESOURCES:

<http://nptel.ac.in/courses/>

EC-106

ECONOMICS FOR ENGINEERS

L T P C
4 - - 3**COURSE OBJECTIVES:**

1. To provides the students with knowledge of basic economic problems and the relationship between engineering technology and economics.
2. To alerts the students to understand the demand determinants and the methods of demand forecasting of a product.
3. To give knowledge to the students about various costs for determining the manufacturing of a product.
4. To guide the students for accounting the depreciation and providing the funds for replacement of necessary and depreciated machinery and equipment.
5. To sensitize the students to the changing environment of banking scenario and to understand the functions of RBI.

COURSE OUTCOMES:**After successful completion of the course, the students are able to**

1. understand the decision making objective of a firm.
2. get knowledge about overall functions of Demand, Supply, Price, Income of the firms.
3. linkage various cost concepts and to understand how to maintain break even scenario for a business.
4. get knowledge about time value of money in and how to use Accounting concepts in the changing society.
5. know the overview of Liberalization, Privatization and Globalization and the impact of them on economy.

UNIT I*Text Book - 1,2 (10)*

ENGINEERING ECONOMICS - AN OVERVIEW : Economics definition, Functions & Scope of Engineering economics, Basic economic problem, Relationship between Science, Engineering, Technology and Economics.

FIRMS OBJECTIVE: Theories of Maximization - Profit Maximization, Growth Maximization, Sales Revenue Maximization, Utility Maximization and Wealth Maximization.

UNIT II*Text Book - 2,3 (8)*

THEORY OF DEMAND - AN OVERVIEW : Demand schedule, Nature and characteristics of demand, Law of demand, Limitations to the law of demand, Elasticities of Demand: Price, Income and Cross elasticity, Demand Forecasting definition, factors determining demand forecasting, methods of demand forecasting.

UNIT III*Text Book - 4 (12)*

COST CONCEPTS - AN OVERVIEW : Introduction, Types of costs: Fixed cost, Variable cost, Average cost, Marginal cost, Real cost, Opportunity cost, Accounting and Economic cost, Cost - Volume profit analysis, Break - Even analysis, Operating leverage.

UNIT IV*Text Book - 4 (12)*

ACCOUNTING CONCEPTS - AN OVERVIEW : Accounting concepts, Double Entry system, Journal, Ledger, Trial balance, Final Accounts Book Keeping system, Depreciation - Definition, functions, methods of depreciation - Straight line, Declining balance Sum of years digits method and Problems.

UNIT V

Text Book - 3,5 (8)

INDIAN ECONOMY - AN OVERVIEW : Nature and characteristics of Indian economy, Banking - Meaning and functions of Commercial banks, Functions of RBI. Globalization, Privatization - Meaning , merits and de - merits, Elementary concepts like WTO, GATT, TRIPS, Monetary Policy and Fiscal Policy.

LEARNING RESOURCES:**TEXT BOOK(s):**

1. Riggs, Bedworth and Randhwa, Engineering Economics, McGrawhill Education India.
2. S.C.Sharma and T.R.Banga, Industrial Organisation and Engineering Economics, Khanna Publishers.
3. S.K.Misra and V.K.Puri, Economic Environment of Business, Himalaya Publishing House,2003.
4. K.Rajeswara Rao and G.Prasad, Accounting and Finance, Jai Bharat Publishers , 2014
5. Francis Cherunilam, Business Environment Text and Cases, Himalaya Publishing House, 2014

REFERENCE BOOK(s):

1. Singh A and Sadh A.N., Industrial Economics , Himalaya Publishing House , Bombay
2. H.L.Ahuja, Managerial Economics,S.Chand Publishing ,2007 Ediction
3. Datt & Sundharam, Indian Economy , S.Chand Publishing, 2014 Edition

WEB RESOURCES:

1. www.managementstudyguide.com : Describes about the amalgamation of economic theory with business practices.
2. www.tutorialspoint.com : Provides a platform to learn various courses discussed in the syllabus.

EC-151

PHYSICS LAB

L T P C
- - 3 2**COURSE OBJECTIVES:**

1. To give background in experimental techniques and to reinforce instruction in physical principles.
2. To find measurement, data, error, or graphical analysis in addition to illustrating a physical principle.
3. To give skills that can transfer critical thinking into problem solving methods. How to identify what data is important, how to collect that data, and then draw conclusions from it.

COURSE OUTCOMES:**After successful completion of the course, the students will be able to**

1. use CRO, signal generator, spectrometer for making measurements.
2. test the optical components using principles of interference & diffraction.
3. determine the selectivity parameter in electrical circuits.

List of Experiments:

1. Interference fringes - measurement of thickness of a foil using wedge method.
2. Newton's rings - measurement of radius of curvature of Plano - convex lens.
3. Lissajous' figures - calibration of an audio oscillator.
4. Photo cell - characteristic curves and determination of stopping potential.
5. Diffraction grating - measurement of wavelengths.
6. Torsional pendulum - determination of Rigidity modulus of a wire.
7. Photo-Voltaic cell - determination of fill factor.
8. Series LCR resonance circuit - determination of Q factor.
9. Sonometer - determination of A.C. frequency.
10. Laser - determination of single slit diffraction.
11. B - H Curve - Variation of magnetic field along the axis of a circular current carrying coil.
12. Optical Fiber - Determination of Numerical Aperture and Acceptance Angle.

REFERENCE BOOK : Physics Lab Manual , R.V.R. & J.C. CE, Guntur**Note:** A minimum of 10(Ten) experiments have to be performed and recorded by the candidate to attain eligibility for Semester End Practical Examination.

EC-152

ENGINEERING GRAPHICS LAB
(To be taught & examined in First angle projection)

L T P C
2 - 4 2

COURSE OBJECTIVES:

1. Comprehend general projection theory with emphasis on orthographic projection to represent three dimensional objects in two dimensional views.
2. To be able to plan and prepare neat orthographic drawings of points, Straight lines, Regular planes and solids
3. Draw and identify various types of section and Auxiliary views .
4. To enable the students the aspects of development of surfaces in sheet metal working
5. Introduce Auto CAD software for the creation of basic entities and usage of different tool bars.

COURSE OUTCOMES:**After successful completion of the course, the students will be able to**

1. acquire basic skills in Technical graphic communication
2. visualize and communicate with 2D as well as three dimensional shapes.
3. understands the application of Industry standards and best practices applied in Engineering Graphics
4. apply the knowledge of development of surfaces in real life situations
5. draw simple 2D Engineering Drawings using Auto CAD.

List of Experiments:**Practice with mini Drafter on Drawing sheets:**

General: Use of Drawing instruments, Lettering -Single stroke letters, Dimensioning- Representation of various type lines, Geometrical Constructions, Representative fraction.

Conic sections: general construction and special methods for ellipse, parabola and hyperbola.

Cycloidal curves: cycloid, epicycloid and hypocycloid; involute of circle , and Archemidian spiral.

Method of Projections: Principles of projection - First angle and third angle projection of points. Projection of straight lines. Traces of lines.

Projections of Planes: Projections of planes, projections on auxiliary planes.

Projections of Solids: Projections of Cubes, Prisms, Pyramids, Cylinders and Cones with varying positions.

Sections Of Solids: Sections of Cubes, Prisms, Pyramids, cylinders , and Cones. true shapes of sections. (Limited to the Section Planes perpendicular to one of the Principal Planes).

Development of Surfaces: Lateral development of cut sections of Cubes, Prisms, Pyramids, Cylinders and Cones.

Isometric Projections: Isometric Projection and conversion of Orthographic Projections into isometric views. (Treatment is limited to simple objects only).

Orthographic Projections: Conversion of pictorial views into Orthographic views. (Treatment is limited to simple castings).

Computer Aided Drafting (Using any standard package) (Demonstration only) :

Setting up a drawing: starting , main menu (New, Open, Save, Save As etc.), Opening screen, error correction on screen, units, co-ordinate system, limits, grid, snap, ortho

Tool bars: Draw tool bar, object snap tool bar, modify tool bar, dimension tool Bar

PRACTICE OF 2D DRAWINGS: Exercises of Orthographic views for simple solids using all commands in various tool bars.

LEARNING RESOURCES:

TEXT BOOK(s):

N.D. Bhatt & V.M. Panchal - Engineering Drawing, 50th Edition, Charotar publishing house , 2010.

REFERENCE BOOK(s):

1. Prof.K.L.Narayana & Prof. R.K.Kannaiah - Engineering Drawing, Scitech Publications, 2010.
2. James D. Bethune - Engineering Graphics with AutoCAD 2002, PHI, 2011.

COURSE OBJECTIVES:

1. To acquaint the students with the standard English pronunciation, i.e., Received Pronunciation(RP), with the knowledge of stress and intonation.
2. To develop the art of effective reading and answer comprehension passages.
3. To enable the students use phrasal verbs and idiomatic expressions in an apt manner.
4. To equip with appropriate and spontaneous speech dynamics.
5. To develop production and process of language useful for social and professional life.

COURSE OUTCOMES:**After successful completion of the course, the students will be able to:**

1. know the IPA phonetics symbols, and their relation to pronunciation; recognize the difference among the native, regional and neutral accent of English.
2. employ different skills, inferring lexical and contextual meaning and attempt comprehension passages.
3. use confidently phrases and idioms for effective communication.
4. develop appropriate speech dynamics in professional situations.
5. focus on communication skills and social graces necessary for effective communication.

List of Exercises / Activities:**1. Phonetics :**

- (i) Sounds, Symbols, Stress and Intonation.
- (ii) Pronunciation - Mother tongue influence - Indianisms etc.

2. Reading Comprehension :

Strategies, Reading skills - Skimming and Scanning, Intensive and Extensive reading.

3. Idioms & Phrases : Idioms of variety.**4. Interactive classroom activities.**

Jam - (Guided & Free) - Extempore - Elocution - Telephonic Skills.

Articulation and flow of oral presentation - voice modulation - content generation - Key Word Approach (KWA).

5. Communication Skills

Greeting and Introducing; Making Requests; Agreeing and disagreeing; Asking for and giving permissions; Offering help; Art of small talk; making a short formal speech; Describing people, places, events & things.

REFERENCE BOOK(S) :

1. A Course in Listening & Speaking II, Foundation books by G.Raja Gopal,2012(For Exercises 1 & 4)
2. Books on GRE, IELTS & TOEFL (For Exercises 2)
3. English Idioms by Jennifer Seidl W. Mc Mordie, OUP, V Edition , 2009 (For Exercise 3)
4. Interactive classroom activities. (10 titles -CUP) (Unit-IV) (For Exercise 4)
5. A course in English Communication - by Kiranmai Dutt, Rajeevan,C.L.N Prakash, 2013. (For Exercise 5)
6. Better English Pronunciation-J.D.O' Connor, Second Edition, 2009, Cambridge Semester Press, 2012. (For Exercise 1)

SOFTWARE :

1. Pronunciation power I & II
2. Author plus - Clarity.
3. Call Centre Communication - Clarity.