

FACULTY OF ENGINEERING
Scheme of Instruction & Examination
and
Syllabi

B.E. II Semester

of
Four Year Degree Programme
in

Mechanical Engineering
Production Engineering
Automobile Engineering

(With effect from the academic year 2016-17)

(As approved in Faculty Meeting held on 18 June 2016)



Issued by

**Dean, Faculty of Engineering
Osmania University, Hyderabad
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SCHEME OF INSTRUCTION & EXAMINATION
B.E. II - SEMESTER
(MECHANICAL ENGINEERING, PRODUCTION ENGINEERING, &
AUTOMOBILE ENGINEERING)

S. No	Course Code	Course Title	Scheme of Instructions (Contact Hrs/Wk)			Scheme of Examination			Credits
			L	T	Pr/Drg	CIE	SEE	Duration in Hrs	
Theory Courses									
1.	BS 201 MT	Engineering Mathematics II	3	1	0	30	70	3	3
2.	BS 202 PH	Engineering Physics II	3	0	0	30	70	3	3
3.	BS 203 CH	Engineering Chemistry II	3	0	0	30	70	3	3
4.	HS 204 EG	Business Communication and Presentation Skills	3	0	0	30	70	3	3
5.	ES 205 CE	Engineering Mechanics-II	3	1	0	30	70	3	3
Practical / Laboratory Courses									
6.	BS 251 PH	Engineering Physics Lab II	0	0	2	25	50	3	1
7.	BS 252 CH	Engineering Chemistry Lab II	0	0	2	25	50	3	1
8.	ES 930 CS	Computer Skills Lab	0	0	2	25	50	3	1
9.	HS 253 EG	Communication Skills Lab	0	0	2	25	50	3	1
10.	ES 254 ME	Engineering Graphics-II	0	0	2x2	50	50	3	2
11.	ES 255 ME	Engineering Workshop-II	0	0	2	25	50	3	1
		Total	15	2	14	325	650		22

BS: Basic Sciences
 PC: Professional Course
 OE: Open Elective

ES: Engineering Sciences
 HS: Humanities and Sciences
 CIE: Continuous Internal Evaluation

MC: Mandatory Course
 PE: Professional Elective
 SEE: Semester End Examination (Univ.Exam)

L: Lectures T: Tutorials

Note: 1) Each contact hour is a Clock Hour

2) The practical class can be of two and half hour (clock hours) duration as per the requirement of a particular laboratory.

Course Code	Course Title				Core/Elective		
BS 201 MT	Engineering Mathematics – II (Common to all branches)				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	3	1	0	0	30	70	3
Course Objectives:							
<ul style="list-style-type: none"> ➤ To provide an overview of ordinary differential equations ➤ To introduce series solutions of differential equations ➤ To study special functions like Legendre and Bessel functions ➤ To learn Laplace transforms and its properties 							

UNIT – I

Ordinary Differential Equations of First Order : Exact First Order Differential Equations , Integrating Factors, Linear First Order Equation , Bernoulli's Equation, Riccati's Equation, Clairaut's Equation, Orthogonal Trajectories of a Given Family of Curves, RL - Circuit, RC - Circuit, Newton's Law of Cooling, Law of Growth and Decay.

UNIT – II

Linear Differential Equations of Higher Order : Solutions of Linear Homogenous and Non-homogenous Differential Equations with Constant Coefficients, Solution of Euler-Cauchy Equation, Linearly Dependence and Independence of Functions, Method of Reduction of Order, Method of Variation of Parameters.

UNIT – III

Series Solutions of Differential Equations : Ordinary and Singular Points of an Equation, Power Series Method, Frobenius Method, Legendre's Differential Equation and Legendre Polynomials $P_n(x)$, Rodrigue's Formula, Generating Function for Legendre's Polynomials $P_n(x)$ (without proof), Recurrence Relations for Legendre's Polynomials $P_n(x)$, Orthogonal Property of Legendre Polynomials $P_n(x)$.

UNIT – IV

Special functions : Gamma Function, Beta Function, Relation between Gamma and Beta Functions, Error Function, Bessel's Differential Equation, Bessel's Functions of the First Kind , Derivatives and Integrals of Bessel's Functions, Recurrence Relations for Bessel Functions, Generating Function for Bessel Functions(without proof).

UNIT – V

Laplace Transforms: Introduction to integral Transforms, Kernel of Integral Transforms, Laplace Transform, Inverse Laplace Transform, Properties of Laplace and Inverse Laplace transforms , Laplace Transform of Unit step Function, Impulse Function and Periodic Function, Convolution Theorem(without proof), Solution of Ordinary Differential Equations using Laplace Transform.

Suggested Reading:

- 1) Larry Turyn, "Advanced Engineering Mathematics", CRC Publications, 2014.
- 2) R.K.Jain and S.R.K.Iyengar, "Advanced Engineering Mathematics", Narosa Publications, Fourth Edition, 2014.
- 3) Srimanta Pal and Subodh C. Bhunia, " Engineering Mathematics" , Oxford University Press ,2015.
- 4) Peter V.O'Neil, "Advanced Engineering Mathematics", CENGAGE Learnig, 7th Edition,2013.
- 5) Dean G.Duffy ," Advanced Engineering Mathematics with MALAB" ,Third Edition.
- 6) Eerwin Kreyszig, "Advanced Engineering Mathematics", Wiley- India, 9thEdition, 2012

Course Code	Course Title				Core/Elective		
BS 202 PH	Engineering Physics-II (Common to all branches)				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	3	0	0	0	30	70	3

Course Objectives:

- The aim of this course is to acquire the basic knowledge on elements of solid state physics. To understand the properties of semiconducting, superconducting, dielectric and magnetic materials in their bulk form. To acquire the knowledge on latest material characterization techniques such as X-ray Diffractometry (XRD), Scanning Electron Microscopy (SEM), Atomic Force microscopy (AFM) and Raman Spectroscopy. Also get introduction to basics of thin films and nano materials.

UNIT- I

Crystallography: Crystal systems - Bravais lattices - Lattice planes and Miller Indices - Inter planar spacing - Bragg's law - Experimental determination of lattice constant by powder diffraction method.

Crystal defects: Classification of defects - Concentration of Schottky defects in metals and ionic crystals - Concentration of Frankel defects.

Band Theory of Solids: Classical free electron theory (qualitative) - Energy band formation in solids - Kronig-Penney model (qualitative treatment) - Fermi energy and Fermi level in metals - Classification of solids into conductors, semiconductors and insulators.

UNIT- II

Magnetic Materials: Classification of magnetic materials: dia, para, ferro, antiferro and ferrimagnetic materials - Weiss molecular field theory of ferromagnetism - Magnetic domains - Hysteresis curve - Soft and hard magnetic materials - Properties and Applications of ferrites.

Superconductivity: Introduction - General properties of super conductors - Meissner effect - Type I and Type II superconductors - BCS theory (qualitative) - High T_c superconductors (in brief) - Applications of superconductors, Josephson's Junction and SQUIDS.

UNIT- III

Semiconductors: Intrinsic and Extrinsic semiconductors - Concept of a hole - Concept of Fermi level in semiconductor - Carrier concentration in intrinsic semiconductors - P-N junction diode and its I-V characteristics - Thermistor - Hall effect.

Dielectric Materials: Dielectrics - Types of dielectric polarizations - Electronic polarization, Ionic, Orientational and Space-charge polarizations - Expression for Electronic polarization - Frequency and temperature dependence of dielectric polarizations - Determination of dielectric constant by capacitance Bridge method - Ferro electricity - Barium titanate - Applications of Ferroelectrics.

UNIT-IV

Techniques for characterization of materials: Principles of X-ray fluorescence - Raman effect (Quantum approach) - Atomic force microscopy - Electron microscopy (SEM).

Thin films: Distinction between bulk, thin films and nano materials - Thin film preparation techniques: Thermal evaporation methods, Electron beam evaporation - Applications of thin films - Solar cell.

UNIT-V

Nanomaterials: Properties of materials at reduced size: Electrical, Optical, Mechanical and Magnetic properties - Surface to volume ratio at nano scale - Quantum confinement - Preparation of nanomaterials: bottom-up methods (sol gel and CVD), Top-down methods (ball milling) - Elementary ideas of carbon nanotubes - Applications.

Suggested Reading:

- 1) C. Kittel - Introduction to Solid State Physics, Wiley Eastern Ltd. 5th Edition, 1976.
- 2) S.L. Gupta and V. Kumar - Solid State Physics, K. Nath & Co., 8th Edition, 1992.
- 3) A. Goswami - Thin Film Fundamentals, New Age International, 2007.
- 4) A.K Bhandhopadhyaya - Nano Materials, New Age International, 1st Edition, 2007.
- 5) M.S. Avadhanulu and P.G. Kshirasagar - Engg. Physics, S.Chand & Co., 1st Edition, 1992.
- 6) C.M. Srivastava and C. Srinivasan - Science of Engg. Materials, New Age International, 2002.
- 7) D.K. Bhattacharya and Poonam Tandon - Engg. Physics, Oxford Higher Education.

Course Code	Course Title				Core/Elective		
BS 203 CH	ENGINEERING CHEMISTRY - II (Common to all branches)				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	3	0	0	0	30	70	3
Course Objectives:							
<ul style="list-style-type: none"> ➤ To study the various types of electrodes, cells and batteries & their applications. ➤ To study the various types of corrosion, the factors that influencing the corrosion & various corrosion controlling methods. ➤ To study the various types of chemical fuels, composites & liquid crystals. 							

UNIT- I

ELECTROCHEMISTRY: Electrolytic conductors-conductance, specific conductance, equivalent conductance and molar conductance. Cell constant, measurement of electrolytic conductance. Effect of dilution on various conductivities. Kohlrausch law and its applications – determination of λ^∞ of weak electrolytes, solubility product and degree of dissociation. Principle and applications of conductometric titrations. Numerical problems.

Electrolytic and galvanic cells, cell notation, concept of electrode potential, single electrode potential and its determination. Electrochemical series and emf calculations. Types of electrodes- Hydrogen, Calomel, Quinhydrone and Glass electrode. Nernst equation and its applications. Determination of pH by using Quinhydrone and Glass electrodes. Principle and applications of Potentiometric titrations. Numerical problems.

UNIT-II

CHEMISTRY OF BATTERIES: Chemical Cells - Primary batteries: Zin-Carbon battery. Secondary batteries: Lead-acid battery, charging and

discharging reactions and its applications. Lithium ion batteries, advantages and applications.

Solar Cells: Concept of Solar energy conversion, Photovoltaic cells.

Fuel Cells: Concept of fuel cells and their advantages. H₂-O₂ alkaline fuel cell and methanol-Oxygen fuel cell.

UNIT-III

CORROSION AND ITS CONTROL: Introduction, causes and effects of corrosion-Dry or chemical corrosion and wet or electro chemical corrosion and their mechanism. Pilling-Bedworth Rule and its significance. Types of electrochemical corrosion-Differential aeration, Galvanic, Waterline and Pitting corrosion. Factors effecting rate of corrosion: a) Nature of metal –galvanic series, over voltage, relative areas of anode and cathode, purity of metal, nature of surface oxide film b) Nature of environment-effect of temperature, effect of humidity and effect of pH.

Corrosion control methods: Cathodic protection –Sacrificial anode and impressed current cathode methods. Corrosion inhibitors-anodic and cathodic inhibitors.

Surface Coatings: Types of metallic coatings-anodic and cathodic coatings methods of application of metallic coatings: Hot-dipping, galvanizing, tinning and electroplating. Paints-constituents and their functions.

UNIT-IV

CHEMICAL FUELS: Definition and Classification. Requirement of a good fuel, advantages, disadvantages of solid, liquid and gaseous fuels.

Combustion: Ignition temperature of a fuel. Calculation of air quantities by weight and volume required for the combustion of the fuels. Calorific value of the fuel-lower calorific value (LCV) Higher calorific value (HCV)-theoretical calculations of calorific value by Dulong's formula –Numerical problems.

Solid Fuels: Coal-Proximate and Ultimate analysis and its significance.

Liquid fuels: Source- fractional distillation of petroleum, important fractions, and their uses. Cracking and its significance. Catalytic cracking by moving bed method. Knocking, fuel rating- Octane and Cetane numbers.

Gaseous fuels: LPG, CNG composition and uses,

Bio-diesel: Sources. Concept of trans esterification, advantages

UNIT-V

ENGINEERING MATERIALS-II AND GREEN CHEMISTRY Composites: Introduction, constituents of composites. Types of composites-Fibre-reinforced, Particulate and Layered composites. Advantages and applications of Composites.

Liquid Crystals: Introduction, classification of liquid crystals, Thermotropic, Lyotropic liquid crystals. Chemical constitution and liquid crystalline behavior. Molecular ordering in liquid crystals. Nematic, Smectic and Cholestric liquid crystals and their applications.

Green Chemistry: Concept and principles of Green chemistry and examples of clean technology, Atom economy and catalysis.

Suggested Readings:

1. Engineering Chemistry by PC Jain & Monica Jain, Dhanpat Rai Publications.
2. A Text book of Physical Chemistry by PL Soni, OP Dharmara, Sultan Chand & Sons.
3. Engineering Chemistry by Shashi Chawla, Dhanpat Rai Publications.
4. Engineering Chemistry by O.G. Palanna, TMH Publications, New Delhi
5. A text book of Engineering Chemistry by SS Dara, S.Chand & Co.
Engineering Chemistry by C. Parameshwara Murthy, CV Agarwal and Andra Naidu BS Publications.

Course Code	Course Title					Core/Elective	
HS 204 EG	Business Communication and Presentation Skills (Common to all branches)					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	3	0	0	0	30	70	3
Course Objectives:							
<ul style="list-style-type: none"> ➤ To communicate clearly, accurately and appropriately ➤ To learn different models of interpersonal communication ➤ To work in teams effectively and learn how to be effective in using time ➤ To comprehend the difference between technical and general writing ➤ To write reports, scientific papers, letters, Statement of Purpose, Resume ➤ To learn how to plan and prepare to face interviews effectively 							

UNIT – I

Business Communication: Importance of business communication; ABC of technical communication – Accuracy, Brevity, Clarity; Channels of communication: Downward communication, Upward communication, Diagonal communication, Horizontal communication; Organisational GDs

UNIT – II

Interpersonal Communication and Personality Development: Models of interpersonal development, Johari window, Knapp's model, styles of communication; Team work; Persuasion techniques; Mobile Etiquette, e-mail Etiquette; Time Management

UNIT – III

Technical Written Communication: Differences between Technical Writing and General Writing; Report Writing: Types of Reports, Structure/Format, Language Style, Writing Technical Reports; Writing Scientific Papers

UNIT – IV

Career Oriented Written Communication: Writing SOPs; Job Application: Language style and Format; Résumé writing: design and style; Cover Letter; Business Letters: Letters of enquiry and responses, Letters of complaint, Letters of adjustment, Sales letters; Agenda and minutes of the meeting

UNIT – V

Interview Skills and Group Discussions: Interviews: Purpose, Planning, Preparation, Language and style, Sample interview questions and answers; Group discussions: Types of GDs, Features of good GDs, Preparing for a group discussion

Suggested Readings:

1. E. Suresh Kumar, *Engineering English*, Orient Blackswan, 2014.
2. E. Suresh Kumar et al., *Communication Skills and Soft Skills*. Pearson, 2011.
3. E. Suresh Kumar et al., *English for Success*. Cambridge University Press India Private Ltd, 2010.
4. Sanjay Kumar and Pushp Lata. *Communication Skills*. OUP, 2011.
5. Kavita Tyagi and Padma Misra. *Professional Communication*. PHI, 2011.
6. Meenakshi Raman and Sangeeta Sharma. *Technical Communication: Principles and Practice*. OUP, 2011.

Course Code	Course Title				Core/Elective		
ES 205 CE	Engineering Mechanics II				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	3	1	0	0	30	70	3

Course Objectives:

- To Understand the mass moment of inertia analysis for the different bodies.
- To Know basic concepts of dynamic loads, their behavior, analysis and motion bodies
- To Determine the work energy principles and impulse momentum theory

UNIT - I

Centre of Gravity and Mass Moment of Inertia: Centre of gravity and mass moment of inertia for solid and composite bodies. Radius of gyration

Virtual Work: Principle of virtual work and its application to simple systems.

UNIT - II

Kinematics: Rectilinear motion, curvilinear motion, Velocity and acceleration, Types of rigid body motion, and its analysis in a plane.

UNIT - III

Kinetics: Analysis as a particle and as a rigid body in Translation, Fixed axis rotation, Rolling bodies and Plane motion.

UNIT - IV

Work -Energy: Principles of work- energy, and its applications to bodies in Translation, Particle motion and connected systems. Fixed axis rotation and Plane motion.

UNIT - V

Impulse momentum: Linear impulse momentum, Conservation of momentum, Elastic impact and Plane motion.

Suggested Readings:

1. Ferdinand L. Singer. (1975). "Engineering mechanics", Harper & Collins, Singapore.
2. Timoshenko, S.P. and Young, D.H (1983). "Engineering Mechanics", Mcflraw-Hill International Edition.
3. Rajashekar, S and G.Sankarasubramanyan , "Engineering Mechanics". Vikas Publications.
4. Junarkar, S.B. and Shah, H.J. (2001). "Applied Mechanics", Charotar Publishers.
5. Shames, I.H. (1987). "Engineering Mechanics", Prentice Hall of India.
Bhattacharyyya, B. (2015). "Engineering Mechanics." Oxford Higher Education.

Course Code	Course Title				Core/Elective		
BS 251 PH	Engineering Physics Lab -II (Common to all branches)				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	0	0	0	2	25	50	1

LIST OF EXPERIMENTS:

- Dielectric Constant:** To determine the dielectric constant and phase transition temperature of given material (PZT).
- B-H Curve:**(a) To draw graph between the magnetising field and the intensity of magnetisation of a ferromagnetic specimen and (b) To determine i) Coercivity ii) Retentivity and iii) Hysteresis loss of given specimen (soft iron) from the graph.
- P-N Junction Diode:** To draw the volt-ampere characteristics of the given P-N junction diode.
- Photo Cell:** To determine the planck's constant and the work function of the photometal.
- Thermister:** To draw the temperature characteristics of a thermistor and to evaluate the constants
- Solar Cell:** To draw I-V characteristics of a solar cell and to calculate the (a) Fill factor (b) Efficiency and (c) Series resistance
- Hall Effect:** To determine the (a) Hall coefficient (b) Carrier concentration and (c) Mobility of charge carriers of given semi conducting material.
- Thermo Electric Power:** To calculate (a) Thermoelectric power (b) Fermi Energy and (c) Carrier concentration of given ferrite sample.

9. **Four Probe Method:** To determine the conductivity of semiconductors.
10. **Energy gap of a Semiconductor:** To determine the energy gap of a given semiconductor.
11. **CRO :** Measurement of amplitude, frequency and phase sinusoidal signal.

Course Code	Course Title					Core/Elective	
BS 252 CH	ENGINEERING CHEMISTRY LAB - II (Common to all branches)					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	0	0	0	2	25	50	1

LIST OF EXPERIMENTS:**INSTRUMENTAL ANALYSIS****CONDUCTOMETRY**

1. Conductometric titration of strong acid vs strong base
2. Conductometric titration of weak acid vs strong base
3. Conductometric titration of mixture of acids vs strong base
4. Conductometric precipitation titration-barium chloride against sodium sulphate

POTENTIOMETRY

1. Potentiometric acid-base titration –strong acid vs strong base, using quinhydrone electrode.
2. Potentiometric redox titration-KMnO₄ vs Fe⁺² pH Metry
1. pH metric titration of strong acid vs strong base titration
2. pH metric titration of weak acid vs strong base titration

COLORIMETRY

1. Verification of Beer's Law –using Potassium permanganate
2. Estimation of KMnO₄(Mn) in the given solution

3. Estimation of iron in cement

KINETICS

1. First order reaction-hydrolysis of methyl acetate
2. Second order reaction-potassium iodide and persulphate

Suggested Readings:

1. Senior practical Physical Chemistry, BD Khosla, A.Ghulati, VC.Garg., R.Chand and Co., New Delhi 10th ed. 2001.
2. Practical Physical Chemistry, B.Vishwanathan, P.S Raghavan, Viva Books Private Limited

Course Code	Course Title					Core/Elective	
ES 930 CS	Computer Skills Lab					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	0	0	0	2	25	50	1
Course Objectives: <ul style="list-style-type: none"> ➤ To learn assembling and disassembling of PC Hardware ➤ To understand the installation of Operating systems ➤ To be able to acquire skills in Productivity tools 							

LIST OF EXPERIMENTS:**I PC Hardware**

1. Identify the peripherals of a computer. (Processor, Memory chips, Mother board, Disk drives, and Controller card such as AGP board, Network cards, Sound card, as well as Parallel and Serial ports etc.,)
2. Disassembling and Assembling PC in working condition. Load the Operating Systems with partitions for Windows and Linux, configure for Network.

II Productivity Tools:

1. **Documentation Using MS-Word** - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, and Bookmarks.
2. **Presentation using MS-PowerPoint:** Creating presentation slides and Enhancing Slides with features like Organizational charts, Excel Charts, Word Art, Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object.

3. **MS Excel** : Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions- like sum, average, standard deviation, and charts.
4. **Internet and HTML:**
 - a) Telnet/Secure Shell (Remote login to university computers)
 - b) Electronic Mail (Communicating with email software)
 - c) File Transfer Protocols (transferring files between networked computers)
 - d) World Wide Web (Interface, Navigation, Search Tools)
 - e) Publishing Web Pages (Using HTML editors to create personal web sites)
 - f) Create the web-page (With title, text, frames, hyperlinks to some sites, pictures, lists, tables, fonts and colors) without using any web authoring tools.
5. **Documentation Using LATEX:** Introduction to Linux Commands, Introduction to LateX, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar tool, Page Formatting, Single/Multi column, Pictures/Objects, Drawing, Hyperlinks, Header/Footer, and Tables.

Suggestion Reading:

1. Peter Norton, "Introduction to Computers" , 6th Edition, McGraw Hill Publishers,
2. Leslie Lamport, "Latex: A Document Preparation System", 2nd Edition, Pearson Education India, 1994.
3. Stefan Kottwitz, "LaTeX Beginner's Guide", Shroff/Packt Publishers, First Edition, 2012.

Course Code	Course Title					Core/Elective	
HS 253 EG	Communication Skills Lab (Common to all branches)					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	0	0	0	2	25	50	1
Course Objectives:							
<ul style="list-style-type: none"> ➤ To learn the appropriate use of language ➤ To learn to use the appropriate body language ➤ To participate in group discussions and debates ➤ To improve their public speaking skills ➤ To improve their presentation and participation skills ➤ To learn how interviews are conducted and faced 							

Notes: a) While teaching the following items, emphasis may be laid on intensive practice in the language lab. Lecturing may be avoided as far as possible.

b) Lab Manual Recommended.

1. **Role play:** Use of dialogues in a variety of situations and settings
2. **Presentation Skills:** Making effective presentations, Expressions which can be used in presentations, Use of non-verbal communication, Coping with stage fright, Handling questions and answer session
3. **Public Speaking:** Planning, Preparation, Techniques of delivery, Handling stage fear/fright
4. **Group Discussion:** Initiating, continuing and concluding a GD, Giving feedback; Practising case studies and Topic based GDs

5. **Debate:** Differences between a debate and a group discussion, Essentials of a debate, Participating in a debate
6. **Interview Skills:** Facing interviews confidently, Use of suitable expressions during interviews; Mock interviews

Suggested Readings:

1. E. Suresh Kumar. *A Handbook for English Language Laboratories (with CD)*. Revised edition, Cambridge University Press India Pvt. Ltd. 2014
2. T. Balasubramanian. *A Text book of English Phonetics for Indian Students*. Macmillan, 2008.
3. Edgar Thorpe. *Winning at Interviews*. Pearson Education, 2006.
4. J. Sethi et al., *A Practical Course in English Pronunciation (with CD)*. Prentice Hall of India, 2005.
5. Hari Mohan Prasad. *How to Prepare for Group Discussions and Interviews*. Tata McGraw Hill, 2006.

Course Code	Course Title					Core/Elective	
ES 254 ME	Engineering Drawing-II (Common to all branches)					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	0	0	2x2	0	50	50	2
Course Objectives:							
<ul style="list-style-type: none"> ➤ To understand the Engineering drawing concepts of section of solids and development of their surfaces. ➤ To know basic concepts of isometric projections. ➤ To determine the orthographic projections for solid sections. ➤ To analyze and obtain the perspective views for different solid bodies. 							

UNIT-I

Working with Advanced drawing options: Drawing multi lines, editing multi lines using Grids & dialog box, creating NURBS, Editing splines.

Grouping and Advanced Editing of Sketched Objects: Selecting groups, editing polylines

Layers: Concept of layers, working with layers, creating, display, locking, unlocking, and delete commands,

Coordinate systems in CAD software, UCS, WCS, MCS.

UNIT-II

Sections of Solids: Introduction- Section Planes, Sections, True shape of Section, sections of prisms, pyramids, cylinders, cones and Spheres.

UNIT-III

Intersection of surfaces: Intersection of plane versus plane, intersection of surfaces of two solids, interpenetration of two solids,

UNIT-IV

Isometric Drawings: Divisions of pictorial projection, divisions of Axonometric projection, theory of isometric drawing, isometric view and isometric drawing, isometric projections, drawing isometric circles, dimensioning isometric object, conversion of isometric view to orthographic views.

UNIT-V

3D Modeling: Creating solid models- creating predefined solid primitives, creating complex solid models by applying Boolean operations, dynamic UCS, Methods of creating solids by extrude, revolve, swept, loft and press pull and slicing solid models.

Suggested Reading:

1. Butt, N.D. (2011). "Engineering Drawing." 5th Edition, Charotar publishing house Pvt. Ltd.
2. Kulkarni, D.M., Rastogi, A.P. and Sarkar, A.K. (2013). "Engineering Graphics with AutoCAD." PHI publications, New Delhi.
3. Sham Tickoo, and Saravanan, D. (2010). "AutoCAD 2010 for engineers and designers." Dreamtech Press.
4. Sham Tickoo. (2011). "AutoCAD 2011: A Problem solving approach" Autodesk Press, USA
5. Venugopal, K. (1998). "Engineering Drawing and Graphics + Autocad", New Age International Ltd., New Delhi.

Course Code	Course Title					Core/Elective	
ES 255 ME	Engineering Workshop-II (Common to all branches)					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	0	0	0	2	25	50	1
Course Objectives:							
<ul style="list-style-type: none"> ➤ To know the usage of smithy tools and its operations. ➤ To acquire the skills in welding and machining of metals. ➤ To familiarize with usage of plumbing tools for making pipe joints and PC parts assembly 							

LIST OF EXERCISES:**SMITHY**

1. Flattening and Bending Operation
2. Upsetting Operation
3. Fullering Operation

WELDING

1. Demonstration of Arc and Gas Welding
2. Lap and Butt Joints and Observation of bead formation
3. Brazing and Soldering

MACHINING

1. Plain, step Turning and Knurling Operations
2. Taper turning Operation
3. Thread Cutting Operation

PLUMBING

1. Making Single Joint with Coupling and Union.
2. Making Tee and 4-way joint
3. Making pipe joint with two different diameters (3/4" x 1/2" Reducer)

PC ASSEMBLY

1. Demo of Assembling PC components

Suggested Reading

1. Venugopal, K, " Workshop manual", Anuradha Publications, Kumbakonam, TN, 2012
2. K.C. John, "Mechanical Workshop" 2nd Edn., PHI, New Delhi, 2010.
3. Hajra Choudary, "Elements of Workshop Technology-Vol. 1, Asian Publishers, 6th Edn., 1993.
3. G.S. Sawhney, "Mechanical Experiments and Workshop Practice", I.K. International Publishing House, New Delhi, 2009.