

FACULTY OF ENGINEERING
Scheme of Instruction & Examination
and
Syllabi
B.E. II Semester
of
Four Year Degree Programme
in
Electrical & Electronics 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
(ELECTRICAL & ELECTRONICS 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 965 ME	Elements of Mechanical Engineering	3	0	0	30	70	3	3
6.	ES 933 EC	Electronic Engineering-I	3	0	0	30	70	3	3
Practical / Laboratory Courses									
7.	BS 251 PH	Engineering Physics Lab II	0	0	2	25	50	3	1
8.	BS 252 CH	Engineering Chemistry Lab II	0	0	2	25	50	3	1
9.	ES 930 CS	Computer Skills Lab	0	0	2	25	50	3	1
10.	HS 253 EG	Communication Skills Lab	0	0	2	25	50	3	1
11.	ES 255 ME	Engineering Workshop-II	0	0	2	25	50	3	1
		Total	18	1	10	305	670		23

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:

- 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:

- 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 965 ME	Elements of Mechanical Engineering					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	3	0	0	0	30	70	3

Course Objectives:

- To learn certain fundamental topics related to mechanical engineering
- To understand basic concepts and applications of thermodynamics.
- To understand the working principles of I.C. engines, Reciprocating compressors
- To familiarize the design and working principles of transmission systems and various manufacturing processes.

UNIT-I

Thermodynamics: Concept of system, process and properties, laws of thermodynamics, Second law statements, Concept of Heat Engine, Heat pump & Refrigerator. Concept of entropy and Clausius inequality, steady flow energy equation for an open system.

UNIT-II

IC Engines: Working of four stroke and two stroke petrol and diesel engine with p-V diagrams, valve timing diagram, calculation of indicated power, brake power, specific fuel consumption, mechanical and thermal efficiencies.

Reciprocating Air Compressors: Working principle of single stage compressor. Work done & efficiency calculations. Effect of clearance volume.

UNIT-III

Heat Transfer: Basic modes of heat transfer, Fourier's law of conduction, Newton's law of cooling, Stefan-Boltzmann law of radiation. One

dimensional steady state conduction heat transfer through plane walls without heat generation.

Heat exchangers: Classification and application of heat exchangers in industry, derivation of LMTD in parallel and counter-flow heat exchangers and problems

UNIT-IV

Power Transmission Elements:

Gears: Definitions and uses of Spur, helical & bevel gears. **Gear Trains:** Classifications and simple problems on simple, compound & Reverted. **Belt drives:** Definitions of velocity ratio, creep and slip, derivations on length of open and cross belt, ratio of tensions of flat belt, condition for maximum power transmission for flat belt.

UNIT-V

Basic Manufacturing Processes:

Welding: Definitions and method of soldering, brazing and welding and differences. Brief description of Arc welding and Oxy- Acetylene welding. **Casting:** Principles and application of sand casting and die casting. **Forming:** Basic concepts of forming processes: Extrusion, rod/wire drawing and Rolling. **Machining:** Working mechanism of Lathe, Milling and grinding machines. Principles of WJM, USM, EDM, LBM and EBM.

Suggested Reading:

1. R.K. Rajput "Thermal Engineering", Laxmi Publications, 2005
2. C. Sachdeva "Fundamentals of Engineering Heat and Mass transfer", Wiley Eastern Ltd, 2004.
3. P.N. Rao "Manufacturing Technology", Vol. 1 & 2, Tata McGraw Hill publishing co, 2010.
4. S.S. Rattan, "Theory of Machines", Tata McGraw Hill, Tata McGraw Education Pvt. Ltd., New Delhi 2010.
5. PK Mishra, "Nonconventional Machining" Narosa Publishing House, New Delhi, 2007.

Course Code	Course Title					Core/Elective	
ES 933 EC	Electronic Engineering-I					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
NIL	3	0	0	0	30	70	3

Course Objectives:

- To study the characteristics of diode in forward and reverse bias and perform mathematical modeling of diode as a resistor and capacitor.
- To perform analysis and design of a complete AC to DC converter consisting of Rectifiers, Filters and regulators.
- To describe the construction and working of a Bipolar Junction Transistor in various modes (CE, CB, CC) and design circuits for stabilization and compensation of a BJT.
- To convert the BJT into its equivalent h parameter model and perform exact and approximate analysis of BJT Amplifiers in mid frequency region for different modes of operation.
- To describe the construction and working of JFET and MOSFET and design FET based amplifiers.

UNIT I

Different types of PN Junction formation techniques - PN Junction Characteristics - biasing- band diagrams and current flow - Diode current equations under forward bias and reverse bias conditions - Junction breakdown in diodes and breakdown voltages - effect of temperature on diode characteristics - Zener Diodes - Zener voltage regulator and its limitation.

UNIT II

Half wave, Full wave and Bridge rectifiers - their operation - performance characteristics and analysis - Filters (L, C, LC and CLC filters) used in power supplies and their ripple factor calculations - design of Rectifiers with and without Filters - Elementary treatment on the functioning of Tunnel diode,

Varactor, Photo, Light Emitting diodes - Liquid Crystal Display -. CRO: study of block diagram of CRO

UNIT III

Transistor Junction formation (collector-base, base-emitter Junctions) - Transistor biasing-band diagram for NPN and PNP transistors - current components and current flow in BJT - Modes of transistor operation - Early effect -BJT input and output characteristics in CB, CE CC configurations - BJT as an amplifier - BJT biasing techniques - Thermal runaway - heat sinks and thermal stabilization - operating point stabilization against temperature and device variations - stability factors - Bias stabilization and compensation techniques - Biasing circuit design.

UNIT IV

Small signal low frequency h-parameter model of BJT - Determination of h parameters - analysis of BJT amplifiers using h-parameter - comparison of CB, CE and CC amplifier configurations - Analysis of BJT amplifier with approximate model - Introduction to low frequency pi and T models - Special Devices: working of UJT, SCR, DIAC, TRIAC and CCD.

UNIT V

JFET formation - operation & current flow - pinch-off voltage - V-I characteristics of JFET - JFET biasing - Low frequency small signal model of FETs - Analysis of CS, CD and CG amplifiers and their comparison - FET as an amplifier and as a switch - Enhancement & Depletion mode MOSFETs - V-I characteristics.

Suggested Readings:

1. Jacob Millman, Christos Halkias, Satyabrata jit, *Electronics Devices and Circuits*, 3rd ed., McGraw Hill Education (India) Private Limited, 2010.
2. S Salivahanan, N Kumar, and A Vallavaraj, *Electronic Devices and Circuits*, 2nd ed., McGraw Hill Education (India) Private Limited, 2007.
3. Millman J., Halkias C.C. and Parikh C, *Integrated Electronics*, 2nd ed., McGraw Hill Education (India) Private Limited, 2009.
4. Donald L Schilling and Charles Belove, *Electronics Circuits, Discrete & Integrated*, 3rd ed., McGraw Hill Education (India) Private Limited, 1989.

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.
- Thermistor:** 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:

- 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:

- 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 255 ME	Engineering Workshop-II					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.