

FACULTY OF ENGINEERING  
Scheme of Instruction & Examination  
and  
Syllabi  
B.E. II Semester  
of  
Four Year Degree Programme  
in  
Computer Science & 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**  
**July 2016**

**SCHEME OF INSTRUCTION & EXAMINATION  
B.E. II - SEMESTER  
(COMPUTER SCIENCE & 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	
<b>Theory Courses</b>									
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.	PC 205 CS	Object Oriented Programming using C++	3	1	0	30	70	3	3
6.	ES 950 EE	Basic Electrical Engg.	3	0	0	30	70	3	3
<b>Practical / Laboratory Courses</b>									
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.	PC 254 CS	C++ Programming Lab	0	0	2	25	50	3	1
		Total	18	2	10	305	670		23

BS: Basic Sciences

ES: Engineering Sciences

MC: Mandatory Course

PC: Professional Course

HS: Humanities and Sciences

PE: Professional Elective

OE: Open Elective

CIE: Continuous Internal Evaluation

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:**

- 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, Linearity 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 Learning, 7<sup>th</sup> Edition,2013.
- 5) Dean G.Duffy , " Advanced Engineering Mathematics with MALAB" ,Third Edition.
- 6) Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley- India, 9<sup>th</sup> Edition, 2012

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

**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. 5<sup>th</sup> Edition, 1976.
- 2) S.L. Gupta and V. Kumar - Solid State Physics, K. Nath& Co., 8<sup>th</sup> Edition, 1992.
- 3) A. Goswami - Thin Film Fundamentals, New Age International, 2007.
- 4) A.K Bhandhopadhyay - Nano Materials, New Age International, 1<sup>st</sup> Edition, 2007.
- 5) M.S. Avadhanulu and P.G. Kshirasagar - Engg. Physics, S.Chand& Co., 1<sup>st</sup> Edition, 1992.
- 6) C.M. Srivastava and C. Srinivasan - Science of Engg. Materials, New Age International, 2002.
- 7) D.K.Bhattacharya and PoonamTandon – Engg. Physics, Oxford Higher Education.

Course Code	Course Title				Core/Elective		
<b>BS 203 CH</b>	<b>ENGINEERING CHEMISTRY - II</b> (Common to all branches)				<b>Core</b>		
<b>Prerequisite</b>	<b>Contact Hours per Week</b>				CIE	SEE	
	L	T	D	P			<b>Credits</b>
<b>NIL</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>70</b>	<b>3</b>

**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  $\lambda\infty$  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: Zinc-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. H<sub>2</sub>-O<sub>2</sub> 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	<b>Business Communication and Presentation Skills</b> (Common to all branches)					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
<b>NIL</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>70</b>	<b>3</b>
<b>Course Objectives:</b>							
<ul style="list-style-type: none"> <li>➤ To communicate clearly, accurately and appropriately</li> <li>➤ To learn different models of interpersonal communication</li> <li>➤ To work in teams effectively and learn how to be effective in using time</li> <li>➤ To comprehend the difference between technical and general writing</li> <li>➤ To write reports, scientific papers, letters, Statement of Purpose, Resume</li> <li>➤ To learn how to plan and prepare to face interviews effectively</li> </ul>							

### **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	
PC 205 CS	Object oriented programming using C++					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 basic notions of object oriented programming
- To acquire object-oriented problem solving skills
- To be able to write programs in C++

**UNIT - I**

**Introduction to C++:** Programming paradigms, Object Oriented Programming Concepts, Advantages and Applications of OOPs.

Variables and assignments, Data types, expressions, Simple flow control and Control structures.

**UNIT - II**

**Functions:** Call by value, call by reference. Parameters using procedural abstraction; Testing and debugging functions. I/O Streams as an introduction to classes and objects.

Introduction to arrays, Arrays in functions, Programming with arrays and multidimensional arrays. Structures, Classes, Abstract data types.

**UNIT - III**

Strings, Pointers and Dynamic Arrays, Recursion, Constructors, Destructors, Copy Constructors.

**Inheritance:** The notation of inheritance, derived classes, overriding, Virtual Base Class

## **UNIT-IV**

**Static Polymorphism:** Function and Operator overloading, Friend function, Runtime Polymorphism, Virtual functions, and Exception Handling. Function Templates, and Class Templates.

## **UNIT – V**

**Pointers and Linked Lists:** Nodes and linked lists, Implementation of stacks and queues using arrays and linked lists, Operation on linked lists- inserting a node, deleting a node, searching for a node

### ***Suggested Reading:***

1. Walter Savitch, "*Problem Solving with C++*", 6<sup>th</sup> Edition, Pearson Education Publishing, 2009.
2. SB Lippman, J Lajoie, "*C++ Primer*", 3<sup>rd</sup> Edition, AW Publishing Company, 2007.
3. ReemaThareja, Object Oriented Programming with C++, first edition, Oxford University Press, 2015.
4. Paul Dietel, Harvey Dietel, "*C How to Program*", 6<sup>th</sup> Edition, PHI, 2010.  
Bjarne Stroustrup, "*The C++ Programming Language*", 3<sup>rd</sup> Edition, Pearson Education.

Course Code	Course Title					Core/Elective	
ES 950 EE	Basic Electrical 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 acquire knowledge in circuits and principle operation of electrical machines.
- To be able to understand the tariff and safety measures.

### Unit-I

**DC & AC Circuits :** Ohm's law, Kirchhoff's laws, Series & parallel circuits, Star & Delta conversions, Thevenin's, Norton's and Superposition theorems (analysis with DC excitation only).

**A.C. Circuits :** Production of sinusoidal voltage, Phasor representation of sinusoidal quantities, Average & rms values, Form factor, RLC circuits excited by sinusoidal input. Active & reactive power, power factor.

### Unit-II

**3-Phase Balanced Circuits:** Star & Delta connections, Measurement of 3-phase power by two-wattmeter method.

**Single-Phase Transformer:** Principle of operation, Constructional details, Transformer on no-load and on load, OC & SC tests, Losses, Efficiency, Regulation.

### Unit-III

**DC Generator:** Principle of operation, Constructional details, EMF equation, Types of generators, Armature reaction, No-load & Load characteristics, Losses & efficiency, Applications.

**DC Motor:** Principle of operation, Types of motors, Torque equation, 3-point

starter, Characteristics of DC motors, Speed control of DC shunt motor, Losses & efficiency, Applications.

#### **Unit-IV**

**Three-phase Induction Motor:** Production of rotating field, Constructional details. Types of motors, Torque-slip characteristics, Star-delta starter, Auto-transformer starter, Losses & efficiency, Applications.

**Single-phase Induction Motors:** Principle of operation, Capacitor run & Capacitor start motor, Applications.

#### **Unit-V**

**Tariff & Electrical Safety Measures:** Types of Tariff: Simple tariff, Flat demand tariff, Flat rate tariff, Step rate tariff, Block rate tariff, Two-part tariff. Types of consumers and their tariff. Power Factor: Disadvantage of low P.F., Causes of low P.F., Improvement of P.F. by using Static Capacitors.

**Electrical Safety Measures:** Earthing and its Importance, Safety practices, Basic ideas of Fuse, Circuit Breaker, and relay.

#### **Suggested Reading**

1. J.B.Gupta, "Fundamentals of Electrical Engineering and Electronics" S.K.Kataria & Sons Publications, 2002.
2. J.B.Gupta, "Utilization of Electric Power and Electric Traction" S.K.Kataria & Sons Publications, 2010.
3. Abhijit Chakrabarti, Sudipta Nath, Chandan Kumar Chanda, " Basic Electrical Engineering" Tata McGraw Hill, Publications, 2009.
4. Hughes, "Electrical Technology", VII Edition, International Student -on, Addison Welsey Longman Inc., 1995.

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	
<b>BS 252 CH</b>	<b>ENGINEERING CHEMISTRY LAB - II</b> (Common to all branches)					<b>Core</b>	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
<b>NIL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>25</b>	<b>50</b>	<b>1</b>

**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-KMnO<sub>4</sub> vs Fe<sup>+2</sup> 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 KMnO<sub>4</sub>(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 10<sup>th</sup> 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*", 6<sup>th</sup> Edition, McGraw Hill Publishers,
2. Leslie Lamport, "*Latex: A Document Preparation System*", 2<sup>nd</sup> Edition, Pearson Education India, 1994.
3. Stefan Kottwitz, "*LaTeX Beginner's Guide*", Shroff/Packt Publishers, First Edition, 2012.

Course Code	Course Title				Core/Elective	
<b>HS 253 EG</b>	<b>Communication Skills Lab</b> (Common to all branches)				<b>Core</b>	
<b>Prerequisite</b>	<b>Contact Hours per Week</b>				<b>CIE</b>	<b>SEE</b>
	<b>L</b>	<b>T</b>	<b>D</b>	<b>P</b>		<b>Credits</b>
<b>NIL</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>25</b>	<b>50</b>
						<b>1</b>

**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.

A detailed description of the course content, learning outcomes, teaching methods, assessment criteria, and other relevant information is provided in the course handbook.

Course Code	Course Title					Core/Elective	
PC 254 CS	C++ Programming 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 write, compile and debug programs in C++ .
- To formulate problems and implement in C++ .
- To acquire skills to solve computing problems in real-world.

#### **LIST OF EXERCISES:**

1. Implementation of complex numbers using classes.
2. Implementation of matrix class.
3. Programs using constructors, destructors and copy constructors.
4. Implementation of Various Sorting Techniques.
5. Programs on Inheritance.
6. Programs on Function overloading, operator overloading, and Exception Handling
7. Programs on Virtual Functions, Dynamic polymorphism.
8. Programs on Function templates and Class templates.
9. Implementation of Stack using arrays and linked list.
10. Implementation of Queue using Arrays and Linked list.

