

# CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY

## ELECTRICAL & ELECTRONICS ENGINEERING

### B. E. I – Year

#### I – Semester

THEORY						
S.No	Code	Subject	L	T	P/D	Credits
1	EG 111	English - I	2	0	0	2
2	MT 111	Mathematics - I	3	1	0	3
3	PY 111	Engineering Physics - I	3	0	0	3
4	CY 111	Engineering Chemistry - I	3	0	0	3
5	CS 111	Programming and Problem Solving	3	1	0	3
6	CE 111	Engineering Mechanics - I	3	1	0	3
7	CE 112	Environmental Studies	3	1	0	3
PRACTICALS						
8	EG112	English Language Laboratory – I	0	0	2	1
9	PY 114/ CY 114	Engineering Physics Lab – I/ Engineering Chemistry Lab – I	0	0	3	2
10	CS 114	Programming Lab – I	0	0	3	2
11	ME 114	Workshop	0	0	3	2
TOTAL			20	04	11	27

#### II – Semester

THEORY						
S.No	Code	Subject	L	T	P/D	Credits
1	EG 121	English – II	2	0	0	2
2	MT 121	Mathematics - II	3	1	0	3
3	PY 122	Applied Physics	3	0	0	3
4	CY 121	Engineering Chemistry - II	3	0	0	3
5	CS 121	Object Oriented Programming through C++	3	1	0	3
6	EE 121	Basic Electrical Engineering	3	1	0	3
7	ME 112N	Engineering Graphics	1	0	3	3
PRACTICALS						
8	EG 122	English Language Laboratory– II	0	0	2	1
9	PY 125/ CY 123	Engineering Physics Lab - II / Engineering Chemistry Lab– II	0	0	3	2
10	CS 122	Programming Lab - II	0	0	3	2
11	EE 122	Basic Electrical Engineering Lab	0	0	3	2

<b>TOTAL</b>	<b>18</b>	<b>03</b>	<b>14</b>	<b>27</b>
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EG 121

**ENGLISH – II**  
**(common to all branches)**

Instruction	2L Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	2

**Course Objectives:**

- To understand the difference between oral and written communication, interpersonal and intrapersonal communication
- To acquaint the students with the process of technical writing through different types of reports and information transfer.
- To enhance the different sub- skills of reading through skimming and scanning.
- To enhance imaginative, creative and critical thinking through literary texts.
- To help students develop their Presentation skills through AV aids and different aspects of body language.

**UNIT- I**

Effective communication: Intrapersonal communication, Interpersonal communication, Dyadic Communication, One way versus two way communication and Johari Window.

**UNIT- II**

Grammar Practice: Common errors in English ad, Punctuation.

**Vocabulary Enhancement:**

Indian and American usage, Words often misspelt, Prefixes & Suffixes, technical vocabulary

Prose: Muthyala Raju Revu: An Engineer Turned IAS Officer.

**UNIT- III**

Writing Skills: Reports, Technical Report Writing, Information transfer: Flow charts, piecharts, graphs and scientific papers

**UNIT- IV**

Reading comprehension – Unknown passages, Skimming and Scanning, intensive reading and critical analysis

Prose: R. Madhavan : Engineering to Farming

**UNIT- V**

Soft Skills: Presentation skills – Rubrics, use of AV aids and making of a Power Point Presentation, Body Language. Leadership skills and Team Building

**Text Books:**

1. “Essential English”- E Suresh Kumar et al. (Orient Black Swan PVT Ltd.)
2. “Communication Skills and Soft Skills: An Integrated Approach”- E Suresh Kumar et al. (Pearson Publications)

**Suggested Reading:**

1. ” High School English Grammar & Composition” – Wren and Martin (S.Chand)
2. “ABC of Common Grammatical Errors” – Nigel D Turton (Macmillan)
3. “Communication Skills & Soft Skills” – An Integrated approach – E Suresh Kumar (Pearson)
4. “Examine your English” – Margaret M Maison (Orient Longman)
5. “Professional Presentation” – Malcolm Goodale (Cambridge University Press)
6. “English Grammar at a glance” – M. Gnanamurali (S. Chand)
7. “Business Communication & Soft skills” (Lab Manual) – D. Sudha Rani (Pearson)
8. “A Course Book in English” – K.R. Lakshminarayan (SciTech Publication)
9. “Effective Technical Communication” – M. Ashraf Rizvi (Tata- McGraw Hill)

## MT 121

### MATHEMATICS – II (common to all branches except Bio-Tech)

Instruction	3L + 1T Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

#### UNIT- I

**Ordinary differential Equations:** Exact Differential equations (integrating Factors) Applications differential equations-Orthogonal trajectories-Problems on oscillatory electrical circuits (LC and LCR circuits). Linear Differential equations of higher order with constant coefficients, complementary function and particular integrals when RHS is of the forms  $e^{ax}$ ,  $\sin ax$ ,  $\cos ax$ ,  $x^m$ ,  $e^{ax}(v)$ ,  $x^m(v)$ , where  $v$ -is a function of 'x', Legendre's and Cauchy's form of Homogeneous equations.

#### UNIT- II

**Laplace Transforms:** Definition of integral transform, domain of the function and kernel of the Laplace transforms. Existence of Laplace transforms. Properties- Laplace transforms of standard functions, Laplace transforms of piecewise continuous functions, first and second shifting theorems, multiplication by 't', division by 't'. Laplace transforms of derivatives and integrals of functions-Unit step function- Periodic functions (without proofs). Inverse Laplace transforms-by partial fractions (Heaviside method), Residue method-Convolution Theorem. Solving Ordinary differential equations by Laplace Transforms

#### UNIT- III

**Series solution of Differential equations:** Introduction-ordinary and singular points of an equation-power series solution- Solution of Legendre equation (without proof)- Legendre polynomials-Rodrigue's formula-Generating function of Legendre polynomials-Recurrence relations- orthogonal property.

#### UNIT- IV

**Vector Differentiation:** Scalar and vector fields- directional derivative- Gradient of a scalar-Divergence and Curl of a vector point function. Properties of divergence, curl - vector identities. Solenoidal and Irrotational vectors.

#### UNIT-V

**Vector Integration:** Vector Line integrals, surface integrals and volume integrals Greens Theorem, Gauss divergence Theorem and Stokes theorem (without proofs) Applications of Integration-problems based on verification and evaluation using the above theorems (for cube, rectangular parallelepiped, sphere, cylinder)

#### Text Books:

1. Advanced Engineering by Kreyszig, John Wiley & Sons -Publishers.
2. Mathematical Methods of Science & Engg, Aided with MATLAB, Kanti.B.Datta. Cengage Learning India Pvt.Ltd.
3. Mathematics for Engineers and Scientists by Alen Jaffery , 6<sup>th</sup> ed 2013 CRC press, Taylor & Francis Group. (Elsevier)
4. Advanced Engineering Mathematics by Michael Greenburg, Second Edition –Pearson Education.

#### Suggested Reading: (for further reading and examples on applications)

1. Mathematics for Engineers-a modern interactive approach by A.Craft and Robert Davison-Wiley
2. Applied Mathematics and physicists by Loius Pipes-Mc Graw Hill publishers.
3. Advanced Engineering Mathematics by R.K.Jain & S.R.K.Iyenger, 3<sup>rd</sup> edition, Narosa Publications
4. Matrices for Engineering Dynamics by AR Collar and A. Simpson-John Wiley & sons
5. Essential Mathematics for Engineers by W.Bolton-Betterworth and Heineman
6. Mathematical for Physicists and Engineers- L F Landoviz, Publishers- Rienfold Book Corporation.
7. Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.
8. Engineering Mathematics by B.V.Ramana
9. Calculus by Smith and Minton

10. Applications of Linear Algebra by David.C Lay

**APPLIED PHYSICS**  
(common to CSE, IT, ECE & EEE)

Instruction	3L Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

**UNIT – I****Elements of Quantum Mechanics:**

Introduction – Dual nature of light – de Broglie’s hypothesis – Expression for de Broglie’s wave length – Heisenberg’s uncertainty principle and its illustration (diffraction of a beam of electron at a slit) – Schrödinger time independent and time dependent wave equations – Interpretation of wave function – Infinite square well potential (particle in a box) – Potential step – Potential barrier (qualitative) – Tunneling effect.

**UNIT – II**

**Crystallography:** Space lattice – Unit cell – Crystal systems – Bravais lattices – Number of atoms per unit cell – Coordination number – Atomic radius – Packing fraction (for SC, BCC, FCC) – Lattice planes – Miller indices – Bragg’s law – Experimental determination of lattice constant of cubic crystals by powder diffraction method.

**Crystal Defects:** Classification of defects – Point defects – Concentration of Schottky & Frenkel defects.

**UNIT – III**

**Band Theory of Solids:** Salient features of classical free electron theory – Energy band formation in solids – Kronig-Penny model (qualitative) – Classification of solids into conductors, semiconductors and insulators.

**Semiconductors:** Intrinsic and extrinsic semiconductors – Concept of hole – Concept of Fermi level – Carrier concentration in intrinsic semiconductors – Conductivity in semiconductors – Hall Effect in semiconductors.

**UNIT – IV**

**Magnetic Materials:** Classification of magnetic materials: dia, para, ferro, anti-ferro and ferrimagnetic materials – Weiss molecular field theory – Domain theory – Hysteresis curve – Soft and hard magnetic materials.

**Dielectric Materials:** Introduction – Dielectric polarization – Types of dielectric polarization: electronic, ionic, orientation and space-charge polarization (qualitative) – Frequency and temperature dependence of dielectric polarization – Determination of dielectric constant (Schering bridge method) – Ferroelectricity – Barium titanate – Applications of ferroelectrics.

**UNIT – V**

**Superconductors:** Introduction – General properties of superconductors – Meissner’s effect – Type I and Type II superconductors – BCS theory (qualitative) – Applications.

**Thin Films:** Distinction between bulk, thin and nanofilms – Thin film preparation techniques – Physical vapor deposition (PVD) techniques – Thermal evaporation – Electron beam evaporation – Pulsed laser deposition – Applications of thin films – Solar cell – Gas sensor.

**Nanomaterials:** Zero dimensional materials – Properties of materials at reduced size – Surface to volume ratio – Quantum confinement – Preparation of nanomaterials – Bottom-up methods: Sol-gel, Sputtering and Chemical vapor deposition (CVD) – Top-down methods: Ball milling – Elementary ideas of carbon nanotubes – Applications.

**Text Books:**

1. M.N. Avadhanulu and P.G. Kshirsagar, *A Text Book Engineering Physics*, S. Chand Publications, 2014
2. S.L. Gupta and Sanjeev Gupta, *Modern Engineering Physics*, Dhanpat Rai Publications, 2011
3. V. Rajendran, *Engineering Physics*, McGahill Education Publications, 2013

**Suggested Reading:**

1. R. Murugesan and Kiruthiga Sivaprasath, *Modern Physics*, S. Chand Publications, 2005
2. M. Arumugam, *Materials Science*, Anuradha Publications, 2002.
3. Satyaprakash and Agarwal, *Statistical mechanics*, Kedannath Publications
4. P.K. Palanisamy, *Engineering Physics*, Scitech Publications, 2012
5. Hitendra K Malik and A.K. Singh, *Engineering Physics*, Tata McGahill Education Publications, 2011

CY 121

**ENGINEERING CHEMISTRY - II**  
(common to all branches except Chemical Engg & Bio-Tech)

Instruction	3L Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

**Course Objectives:**

The syllabus has sought to fulfill the objective of making the student of engineering and technology realize that chemistry like other subjects is the real base of his profession and that therefore he must have a good understanding of chemistry before he can use it in his profession. The various units of the syllabus is so designed to fulfill the following objectives.

1. Thermodynamics and Electrochemistry units give conceptual knowledge about spontaneous processes and how can they be harnessed for producing electrical energy and efficiency of systems. It also includes the devices used for electrical energy storage and captive generation and tapping it as and when required.
2. Newer materials lead to discovering of technologies in strategic areas like defense and space research. Recently modern materials synthesized find applications in industry and creating instruments for solving problems of electronics, telecommunications, health care, agriculture, and technology etc., Inorder to emphasize the above the topics like composite materials, polymers, conducting polymers and nano materials have been incorporated in the curriculum.
3. Knowledge to prevent corrosion of machinery and metallic materials and water chemistry which require serious attention in view of increasing pollution has been included in the syllabus.
4. Fuels have been taught with a view to give awareness as to materials which can be used as sources of energy and fuel cells which are the alternate energy sources for generating electrical energy on spot and portable applications.
5. To appraise the students about the importance and role of chemistry in the field of Engineering by explaining the relevant topics.
6. To enable students to apply the knowledge acquired in improving the properties of engineering materials.

The engineer who has the above background can effectively manage the materials in his designing applications and discovering and improving the systems for various uses in industry, agriculture, health care, technology, telecommunications, electronics and instruments detecting in advance in natural calamities. The above knowledge also helps students to carry out inter disciplinary research such that the findings benefit the common man.

**UNIT – I**

**Electrochemistry**

Introduction, construction of electrochemical cell, sign convention, cell notation, cell emf, SOP and SRP, electrochemical series and its applications

Activity, fugacity, Nernst equation and applications, numericals

Types of Electrodes – Standard Hydrogen Electrode, Saturated Calomel Electrode, Quinhydrone electrode and Ion selective electrode (Glass electrode), construction

**UNIT – II**

**Corrosion Science**

Introduction, causes and effects of corrosion, chemical and electro chemical corrosion, mechanism of electro chemical corrosion

Galvanic corrosion and types of differential aeration corrosion (pitting and waterline corrosion)

Factors affecting corrosion (position of the metals in galvanic series, relative areas of anode and cathode, nature of corrosion product – solubility and volatility of corrosion product, nature of corroding environment – temperature, humidity and  $P^H$ ).

Corrosion control methods – cathodic protection, sacrificial anodic protection and impressed current cathodic protection.

Protective coatings – Anodic and cathodic coatings

Paints, constituents and their functions

**UNIT – III**

**Water Chemistry**

Hardness of water – Types, units of hardness, estimation of temporary and permanent hardness of water by EDTA method, alkalinity of water and its determination

Numericals on hardness and alkalinity

Specifications of potable water, disinfection of water by chlorination, break point chlorination and by ozone treatment

Desalination of water by reverse osmosis and electro dialysis

#### **UNIT – IV**

##### **Fuels – II**

Liquid fuels, fractional distillation of crude oil, cracking and significance, catalytic cracking by fixed bed cracking, knocking, significance, antiknocking agents (TEL, MTBE), octane number, cetane number, unleaded petrol.

Gaseous fuels, LPG, CNG, composition and uses, automobile exhaust – catalytic converter.

##### **Battery Technology**

Types of batteries, Lithium battery and Lithium ion battery, fuel cell – MeOH – Oxygen fuel cell, H<sub>2</sub>-O<sub>2</sub> fuel cell Rocket propellants, requirements of a good propellant, classification, solid-liquid propellants with examples. Photo catalysis

#### **UNIT –V**

##### **Instrumental Techniques in Chemical Analysis**

Principle, method and applications of Conductometry (acid-base titration), Potentiometry (acid-base, redox titration), P<sup>H</sup>-metry (acid – base titration), UV, Visible Spectro photometer (Beer-Lambert's Law), examples

Atomic absorption spectroscopy-Principle, instrumentation (Block Diagram only), estimation of Nickel by Atomic absorption spectroscopy

##### **Text Books:**

1. J.C. Kuriacase & J. Rajaram, "Chemistry in engineering and Technology", Tata McGraw-Hill Pub.Co.Ltd, New Delhi (2008)
2. S.S.Dara & S.S.Umare, "Engineering Chemistry", S.Chand company
3. ShasiChawla, "Text Book of Engineering Chemistry", Dhanpat Rai Publishing Company, NewDelhi (2008)
4. P.C.Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Pub, Co., New Delhi (2002)
5. Puri & Sharma, "Principles of Physical Chemistry
6. P.R.Vijayarathi, "Engineering Chemistry" PHI Learning Private Limited, New Delhi (2011)

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

1. Physical chemistry by P.W.Atkin (ELBS OXFORD PRESS)
2. Physical chemistry by W.J.Moore (Orient Longman)
3. Physical Chemistry by Glasstone
4. Physical Chemistry by T.Engel & Philip Reid, Pearson Publication
5. Introduction to nano materials by T.Pradeep

**OBJECT ORIENTED PROGRAMMING THROUGH C++**  
(common to all branches)

Instruction	3L + 1T Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

**UNIT - I**

**Principles of Object Oriented Programming:** Procedure Vs Object Oriented, Paradigm, Basic concepts, benefits, Applications and Object Oriented Languages.

**Introduction:** Program structure, Creating, Compiling and Linking of C++ program.

**Token, Expression and Control Structures:** Tokens, Keywords, Identifiers and Constants, Data Types, Operators, Precedence, Type Compatibility, Control Structures, New Features of C++.

**Functions:** Function Prototype and Parameter Passing, Inline Functions, Default, Constant Arguments, Recursion, Function Overloading, Function Template.

**UNIT - II**

**Classes and Objects:** Defining classes and Member functions, Arrays, Static Members, Friend Functions.

**Constructors and Destructors:** Type of Constructors, Dynamic Initialization of Objects, Destructors.

**UNIT - III**

**C++ operator overloading:** Fundamentals, restrictions, overloading unary / binary operators, overloading ++ and --, Manipulation of Strings.

**C++ Inheritance:** Defining derived classes, Types of Inheritance, Virtual Base class Abstract Class, Nesting of classes.

**UNIT - IV**

**Pointers and Polymorphism:** Pointers and Generic pointer, Pointer to Objects and Derived Classes, this pointer, Virtual Functions, Virtual Destructors.

**C++ Stream Input/Output:** Streams, Stream classes, Formatted and Unformatted operations, Manipulators.

**Files:** Classes for file Stream operations, Sequential and Random access operations, Command line Arguments

**UNIT - V**

**C++ Templates:** Introduction, class templates, member function template, overloading template functions.

**C++ Exception Handling:** Try, throw, catch

**Suggested Reading:**

1. E. Balagurusamy "Object Oriented Programming with C++", McGraw-Hill Education (India), 6 th Edition 2013
2. Bjarne Stroustrup "The C++ Programming Language", Pearson Education, 5<sup>th</sup> Edition (2013)
3. Robert Lafore "Object-Oriented Programming in C++ " Fourth Edition Sams Publishing,2002



EE 121

**BASIC ELECTRICAL ENGINEERING  
(EEE)**

Instruction	3L + 1T Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

**UNIT- I**

**DC Circuits:** Electric Circuit Parameters(R, L, C), Voltage and Current relationships, Power, Description of independent and dependent sources, KVL & KCL, Passive sign convention, Simple series and parallel circuit analysis, Current and voltage division principles, star-delta transformation, Source Transformation.

**UNIT- II**

**Magnetic circuits:** mmf, magnetic flux, permeability, relative permeability, composite series & parallel magnetic circuits, series – parallel magnetic circuits, comparison between magnetic and electrical circuits.

**Electromagnetic induction:** Faraday's laws of electromagnetic induction, types of induced emf, self and mutual induction, coefficient of coupling, inductances in series and parallel.

**UNIT- III**

**AC Circuits:** Generation of single phase alternating voltage, basic definitions, computation of average value, rms value of time varying periodic signals, complex exponentials, definition of Phasor, phasor domain conversions, steady state response of R, L, C, networks subjected to sinusoidal excitation, Network analysis techniques in phasor domain. Complex power, reactive power, power factor and calculation of power in single phase ac circuits

**UNIT- IV**

**Single phase transformer:** constructional details, working principle, ideal transformer, emf equation.

**DC Machines:** constructional details, working principle of dc generator, types of winding, emf equation, types of excitation. DC machine as motor, back emf, torque equation

**UNIT-V**

**Measuring Instruments:**

Introduction, Types of Instruments, Ammeter, voltmeter, expression for torque of moving coil, moving iron, dynamometer, induction and electrostatic instruments, extension of range of instruments, watt meters.

**Text Books:**

1. Edward Hughes, Electrical Technology, 6th Edition, ELBS, 2001.
2. V N Mittle, Basic Electrical Engineering, TMH Edition, 2009

**Suggested Reading:**

1. Vincent Del Toro, Electrical Engineering Fundamentals, 2nd Edition, PHI, 2003.
2. P.V. Prasad & S. Siva Nagaraju, Electrical Engineering: Concepts & Applications, Cengage Learning.

## ME 112N

### ENGINEERING GRAPHICS (common to CSE, ECE, EEE and IT)

Instruction	1L + 3D Periods per week
Duration of Mid term Examination	90 minutes
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessionals	25 Marks
Credits	3

#### Course Objectives:

1. To provide an exposure in understanding the drawings during a multidisciplinary approach towards a problem
2. To train up in perception and imagination of a three dimensional scenario.

#### Course Outcomes:

1. To understand theory of projections
2. Ability to improve visualization skills
3. Ability to sketch Engineering Objects

#### UNIT- I

**Introduction:** Instruments and their uses, Lettering and dimensioning.

**Simple Geometric Constructions:** Construction of Regular polygons given length of the side.

#### UNIT- II

**Conic sections:** Construction of Ellipse, Parabola & Hyperbola by different methods.

**Orthographic Projections:** Introduction, Projection of points placed in different quadrants.

#### UNIT- III

**Projection of straight lines:** straight line inclined to one of the reference planes - Straight line inclined to both the reference planes with traces.

#### UNIT- IV

**Projection of planes:** projection of perpendicular planes, projection of oblique planes

#### UNIT- V

**Projection of Solids:** Polyhedra, Solids of revolution, Projection of solids with axis inclined to one plane and parallel to another reference plane.

#### Text Books:

1. N.D.Bhatt, "Elementary Engineering Drawing", Charotar Publishers, 2012.
2. Basanth Agrawal and C M Agrawal "Engineering Drawing 2e", McGraw-Hill Education(India) Pvt. Ltd.

#### Suggested Reading:

1. K.L.Narayana and P.K.Kannaiah, "Text Book of Engineering Drawing", Scitech Publications, 2011.
2. P.S.Gill' "Engineering Graphics", Kataria Publications, 2011.
3. K.Veenugopal, "Engineering Drawing and Graphics + Autocad", New Age International Pvt.Ltd, 2011.
4. Shaw M.B and Rana B.C., "Engineering drawing", Pearson, 2<sup>nd</sup> edition, 2009
5. P I Varghees, "Engineering Graphics", Tata McGraw-Hill publications, 2013
6. Bhattacharya. B, "Engineering Graphics", I. K. International Pvt.Ltd, 2009
7. Dhawan R.K., "Principles of Engineering Graphics and Drawing", S. Chand 2011

**ENGLISH LANGUAGE LABORATORY – II**  
(common to all branches)

Instruction	2 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	1

**COMPUTER ASSISTED LANGUAGE LEARNING LAB (CALL)**

**Introduction:**

The language lab focuses on the practice of connected speech and word stress. They are also introduced to the process of Listening. The following are the **objectives** of the course:

1. To recognize and be familiar with word stress and identify stress patterns.
2. To develop awareness of rhythm and notion of stress time.
3. Listen effectively in a variety of situations for a variety of purposes; practice the behavior of effective, active listeners.
4. Assess strengths in listening and set goals for the future.

**SYLLABUS:**

1. Word stress: Primary stress, secondary stress, functional stress, rules of word stress.
2. Rhythm & Intonation: Introduction to Rhythm and Intonation. Major patterns, intonation of English with the semantic implications.
3. Aspects of connected speech: Strong forms, weak forms, contracted forms, elision.
4. Listening skills.

**INTERACTIVE COMMUNICATION SKILLS LAB (ICS LAB)**

**Introduction:**

The objective of the course is to introduce them to the art of making effective presentations. They also learn do debate, the interview process and interview skills.

The following are the **objectives** of the course:

1. To enable students to express themselves fluently and appropriately in social and professional contexts.
2. To provide techniques for preparing and delivering a presentation.
3. Practicing interview skills via an interpersonal encounter similar to real life situation.
4. To understand and communicate various forms of argument effectively, to develop the ability to analyze, evaluate, construct and refute arguments.

**SYLLABUS:**

1. Debate: Differences between a debate and a group discussion. Essentials of a debate, conducting a debate.
2. Presentation Skills: Making effective presentations, expressions which can be used in presentation, use of non-verbal communication, coping with stage fright , handling question and answer session; use of audio- visual aids , Power point presentations.
3. Interview skills: Planning and preparing for interviews, facing interviews confidently, use of suitable expressions during interview.

**Suggested Reading:**

1. E.Suresh kumar et al. , English for Success (with CD), Cambridge University Press India Pvt Ltd. 2010.
2. T Balasubramanian. A Textbook of English Phonetics for Indian Students, Macmillan, 2008.
3. J Sethi et al. A Practical Course in English Pronunciation (with CD), Prentice Hall India, 2005.
4. Edgar Thorpe. Winning at Interviews, Pearson Education, 2006
5. Priyadarshi Patnaik. Group Discussions and Interviews, Cambridge University Press Pvt Ltd 2011

PY 125

**ENGINEERING PHYSICS LAB - II**  
**(common to all branches except Bio-Tech)**

Instruction	3 Periods per alternate week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	2

1. Planck's Constant – Determination of Planck's Constant using photo cell
2. Solar Cell – Study of I-V characteristics of given solar cell and calculation of fill factor, efficiency and series resistance
3. Hall Effect – Determination of Hall coefficient, carrier concentration & mobility of charge carriers of given semiconductor specimen
4. P-N Junction Diode – Study of V-I characteristics and calculation of resistance of given diode in forward and reverse bias
5. B-H Curve – Determination of hysteresis loss of given specimen
6. Dielectric Constant – Determination of dielectric constant of given PZT sample at phase transition temperature
7. Energy Gap – Determination of energy gap of given semiconductor
8. Thermistor – Determination of temperature coefficient of resistance of given thermistor
9.  $e/m$  of Electron by Thomson's Method
10. Thermoelectric Power – Determination of thermoelectric power of given sample

CY 123

**ENGINEERING CHEMISTRY LAB - II**  
(common to all branches except Chemical and Bio-Tech)

Instruction	3 Periods per alternate week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	2

**Course Objectives**

1. To impart fundamental knowledge in handling the equipment/glassware and chemicals in the chemistry laboratory.
2. To offer hands on experience on the basic equipment related to engineering chemistry.
3. For practical understanding of theoretical concepts of chemistry

**I. Volumetric Analysis:**

1. Estimation of amount of copper ion using hypo solution.
2. To find out saponification number of oil.

**II. Complexometry**

3. Estimation of permanent and temporary hardness of water using EDTA solution.
4. Ore analysis – estimation of  $MnO_2$  in pyrolusite.

**III. Organic Preparations**

9. Preparation of aspirin
10. Preparation of azodye

**IV. Instrumental Chemical Analysis**

**i) Potentiometric Titrations**

5. Strong acid vs strong base
6. Redox titration (estimation of  $Fe^{+2}$  using  $KMnO_4$  solutions)

**ii) pH metric titration**

7. Strong acid vs strong base

**iii) Polarimetry**

8. Specific rotation of sucrose and inversion of sucrose.

**Suggested Reading:**

1. Vogel's text book of quantitative chemical analysis by J.Mendham & Thomas, Pearson education; Pvt.Ltd.new Delhi 6<sup>th</sup> ed.2002
2. Senior practical physical chemistry by BD Khosla, A.Ghulati, VC.Garg; R.Chand and CD; New Delhi 10<sup>th</sup> ed 2001.
3. Laboratory manual in engineering chemistry by S.K.Bhasin and Sudha Rani; Dhanpath Rai publishing company.

**PROGRAMMING LAB - II**  
**(common to all branches)**

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	2

1. Program to implement function overloading
2. Program to implement function template
3. Program to implement types of constructors and destructor
4. Program to implement new and delete operators (Dynamic memory allocation).
5. Program to implement unary and binary operator overloading
6. Creation of inheritance hierarchy for graphic shapes.
7. Implementation of runtime polymorphism
8. Classes for Bank Account, Student information, Library catalog
9. Implementation of Streams.
10. Implementation of Template Classes.

EE 122

**BASIC ELECTRICAL ENGINEERING LAB  
(EEE)**

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks
Credits	2

1. Verification of Ohm's law.
2. Verification of KVL & KCL.
3. Verification of Voltage and current division rules.
4. Study of operation of FLUORESCENT lamp.
5. Characteristics of Tungsten and carbon filaments.
6. Measurement of power factor of a coil using 3 ammeters.
7. Measurement of power factor of a coil using 3 volt meters.
8. Determination of the parameters of a coil.
9. Study a series RLC circuit with ac excitation.
10. Current locus of a series RL/RC circuit.
11. Measurement of frequency, time period and amplitude of a sinusoidal voltage using CRO.
12. Study of three point starter.
13. Study of different types of resistors, inductors and capacitors.
14. Introduction to PSPICE.
15. Simulation of basic dc networks using PSPICE.
16. Simulation of basic ac networks using PSPICE.