

SCHEME OF INSTRUCTION & EXAMINATION
B.E. (Electrical and Electronics Engineering) I – SEMESTER
(Common for EEE & EIE)

S. No.	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	P/D	Contact Hrs/Wk	CIE	SEE	Duration in Hrs	
MC: Three Week Induction Programme										
Theory Courses										
1	MC802CE	Environmental Science	2	-	-	2	30	70	3	-
2	MC803PY	Essence of Indian Traditional Knowledge	2	-	-	2	30	70	3	-
3	HS101EG	English	2	-	-	2	30	70	3	2
4	BS201MT	Mathematics-I	3	1	-	4	30	70	3	4
5	BS204CH	Engineering Chemistry	3	1	-	4	30	70	3	4
Practical/ Laboratory Courses										
6	HS151EG	English Lab	-	-	2	2	25	50	3	1
7	BS252CH	Chemistry Lab	-	-	3	3	25	50	3	1.5
8	ES352ME	Workshop / Practice	-	-	6	6	50	50	3	3
Total			12	02	11	25	250	500		15.5

HS: Humanities and Social Sciences BS: Basic Science ES: Engineering Science
 MC: Mandatory Course PC: Professional Core PE: Professional Elective
 L: Lecture T: Tutorial P: Practical D: Drawing
 CIE: Continuous Internal Evaluation SEE: Semester End Evaluation (Univ. Exam) EE: Electrical Engg.

Note:

1. Each contact hour is a clock hour.
2. The duration of the practical class is two hours, however it can be extended wherever necessary, to enable the student to complete the experiment.

Course Code	Course Title				Core/Elective		
MC802CE	Environmental Science				Mandatory		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	2	-	-	-	30	70	-

Course Objectives

- To create awareness and impart basic knowledge about the environment and its allied problems.
- To know the functions of ecosystems.
- To understand importance of biological diversity.
- To study different pollutions and their impact on environment.
- To know social and environment related issues and their preventive measures.

Course Outcomes

After completing this course, the student will be able to:

1. Adopt environmental ethics to attain sustainable development.
2. Develop an attitude of concern for the environment.
3. Conservation of natural resources and biological diversity.
4. Creating awareness of Green technologies for nation's security.
5. Imparts awareness for environmental laws and regulations.

UNIT-I

The Multidisciplinary Nature of Environmental Studies: Definition, scope and importance, need for public awareness.

Natural Resources: Water Resources – Use and over utilization of surface and ground water, flood, drought, conflicts over water, Dams: Benefits and Problems. Food Resources –World Food Problems, effects of modern agriculture, fertilizer-pesticides problems, water logging, salinity, Forest Resources – Use and over exploitation, deforestation & its effect on tribal people. Land Resources– Land Degradation, environmental effect of mining, man induced landslides, soil erosion and desertification. Energy Resources –Growing energy needs, Renewable and Non-renewable energy resources.

UNIT-II

Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in ecosystem, food chains, ecological pyramids, ecological succession, types of ecosystems (marine, pond, river, forest, grassland, desert)

UNIT-III

Biodiversity: Levels of Biodiversity, Bio-geographical classification of India, Value of biodiversity, Threats to biodiversity, endangered and endemic species of India, Conservation of biodiversity, global and national efforts.

UNIT-IV

Environmental Pollution: Definition, Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution, solid waste management.

Environment Protection Act: Air, water, forest and wildlife Acts, issues in the enforcement of environmental legislation.

UNIT-V

Social Issues and the Environment: Watershed management and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion.

Environmental Disaster Management: Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology. Disaster management cycle and disaster management in India.

Field Work:

- Visit to a local area to document environmental issues- agricultural area/ pond/lake/terrestrial ecosystem
- Visit to a local polluted area- market/slum area/Industrial area/traffic area

Suggested Reading:

1. A.K. De, *Environmental Chemistry*, Wiley Eastern Ltd.
2. E.P. Odum, *Fundamentals of Ecology*, W.B. Saunders Co., USA.
3. M.N. Rao and A.K. Datta, *Waste Water Treatment*, Oxford and IBK Publications.
4. Benny Joseph, *Environmental Studies*, Tata McGraw Hill, 2005.
5. V.K. Sharma, *Disaster Management*, National Centre for Disaster Management, IIPE, 1999.

Course Code	Course Title				Core/Elective		
MC803PY	Essence of Indian Traditional Knowledge				Mandatory		
Prerequisite	Contact Hours per Week				CIE	SEE	Mandatory Course
	L	T	D	P			
-	2	-	-	-	30	70	-

Course Objectives

The course will introduce the students to

- To get a knowledge in Indian Philosophical Foundations.
- To Know Indian Languages and Literature and the fine arts in India & Their Philosophy.
- To explore the Science and Scientists of Medieval and Modern India

Course Outcomes

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

1. Understand philosophy of Indian culture.
2. Distinguish the Indian languages and literature among difference traditions.
3. Learn the philosophy of ancient, medieval and modern India.
4. Acquire the information about the fine arts in India.
5. Know the contribution of scientists of different eras.
6. The essence of Yogic Science for Inclusiveness of society.

UNIT – I

Introduction to Indian Philosophy: Basics of Indian Philosophy, culture, civilization, culture and heritage, general characteristics of culture, importance of culture in human literature, Indian culture, Ancient Indian, Medieval India, Modern India.

UNIT – II

Indian Philosophy & Literature: Vedas Upanishads, schools of Vedanta, and other religion Philosophical Literature. Philosophical Ideas the role of Sanskrit, significance of scriptures to current society, Indian Philosophies, literature of south India.

Indian languages and Literature-II: Northern Indian languages & Philosophical & cultural & literature.

UNIT – III

Religion and Philosophy: Religion and Philosophy in ancient India, Religion and Philosophy in Medieval India, Religious Reform Movements in Modern India (selected movements only)

UNIT – IV

Indian Fine Arts & Its Philosophy (Art, Technology & Engineering): Indian Painting, Indian handicrafts, Music, divisions of Indian classic music, modern Indian music, Dance and Drama, Indian Architecture (ancient, medieval and modern), Science and Technology in Indian, development of science in ancient, medieval and modern Indian.

UNIT – V

Education System in India: Education in ancient, medieval and modern India, aims of education, subjects, languages, Science and Scientists of Ancient India, Scientists of Medieval India, Scientists of Modern India. The role Gurukulas in Education System, Value based Education.

Suggested Readings:

1. Kapil Kapoor, "Text and Interpretation: The India Tradition", ISBN: 81246033375, 2005
2. "Science in Samskrit", Samskrita Bharti Publisher, ISBN-13:978-8187276333,2007
3. NCERT, "Position paper on Arts, Music, Dance and Theatre", ISBN 81-7450-494-X,2006
4. S. Narain, "Examination in Ancient India", Arya Book Depot, 1993
5. Satya Prakash, "Founders of Sciences in Ancient India", Vijay Kumar Publisher, 1989
6. M.Hiriyanna, "Essentials of Indian Philosophy", Motilal Banarsidass Publishers, ISBN- 13: 978-8120810990,2014
7. Chatterjee. S & Dutta "An Introduction to Indian Philosophy"

Course Code	Course Title				Core / Elective		
HS101EG	English (Common to All Branches)				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	2	-	-	-	30	70	2
Course Objectives:							
To enhance the English language abilities of Engineering students, especially in reading and writing, by							
<ul style="list-style-type: none"> ➤ using authentic material for language learning ➤ exposing them to a variety of content-rich texts ➤ strengthening their grammar and vocabulary ➤ improving their reading and comprehension skills ➤ honing their writing skills ➤ encouraging them to think creatively and critically 							
Course Outcomes:							
On successful completion of the course, the student will be able to							
<ol style="list-style-type: none"> 1. read, understand, and interpret a variety of written texts 2. use appropriate vocabulary and correct grammar 3. undertake guided and extended writing with confidence. 							

UNIT - I

Reading	: RK Narayan, “A Horse and Two Goats”
Vocabulary	: Word formation—Prefixes, Suffixes, Root Words
Grammar	: Articles, Prepositions, Determiners
Writing	: Guided Writing (Expanding the outline/Writing from verbal cues)

UNIT - II

Reading	: Rudyard Kipling, “If”
Vocabulary	: Word formation—Compounding and Blending, Contractions
Grammar	: Transitions, Connectives
Writing	: Paragraph Writing

UNIT - III

Reading	: Martin Luther King Jr., “I Have a dream”
Vocabulary	: Synonyms, Antonyms, One Word Substitutes
Grammar	: Voice
Writing	: Letter Writing

UNIT - IV

Reading	: Robert Frost, “Road Not Taken”	
Vocabulary	: Homophones, Homonyms, Homographs Grammar	: Narration (Direct-Indirect Speech)
Writing	: Report Writing	

UNIT - V

Reading	: George Orwell, “The Sporting Spirit” (Excerpt)
Vocabulary	: Inclusive Language, Euphemisms
Grammar	: Tense
Writing	: SOP

Suggested Reading:

1. Board of Editors. Language and Life: A Skills Approach. Orient BlackSwan, 2018.
2. Sudharshana, NP and C Savitha. English for Engineers. Cambridge University Press, 2018.
3. Kumar, Sanjay and Pushp Lata. English Language and Communication Skills for Engineers. Oxford University Press, 2018.

Course Code	Course Title				Core / Elective		
BS201MT	Mathematics - I (Common to All Branches)				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	3	1	-	-	30	70	4
Course Objectives <ul style="list-style-type: none"> ➤ To introduce the concepts of sequences, series and their properties ➤ To introduce the concepts of functions of several variables and multiple integrals ➤ To study vector differential and integral calculus Course Outcomes The students will able to <ol style="list-style-type: none"> 1. Find the nature of sequences and series 2. Evaluate multiple integrals 3. Apply this knowledge to solve the curriculum problems 							

Unit-I

Sequences and Series: Sequences, Series, General properties of series, Series of positive terms, Comparison tests, tests of Convergence D'Alembert's ratio test, Cauchy's n^{th} root test, Raabe's test, Logarithmic test, Alternating series, Series of positive and negative terms, Absolute convergence and Conditional convergence.

Unit-II:

Calculus of one Variable: Rolle's theorem, Lagrange's, Cauchy's mean value theorems, Taylor's series, Curvature, Radius of curvature, Circle of curvature, Envelope of a family of curves, Evolutes and Involutives.

Unit-III

Multivariable Calculus (Differentiation): Functions of two variables, Limits and continuity, Partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions (Chain rule), Change of variables, Jacobian, Higher order partial derivatives, Taylor's series of functions of two variables, Maximum and minimum values of functions of two variables, Lagrange's method of undetermined multipliers.

Unit-IV

Multivariable Calculus (Integration): Double integrals, Change of order of integration, Change of Variables from Cartesian to plane polar coordinates, Triple integrals.

Unit-V

Vector Calculus: Scalar and vector fields, Gradient of a scalar field, Directional derivative, Divergence and Curl of a vector field, Line, Surface and Volume integrals, Green's theorem in a plane, Gauss's divergence theorem, Stoke's theorem (without proofs) and their verification.

Suggested Readings:

1. R.K. Jain & S.R.K Iyengar, *Advanced Engineering Mathematics*, Narosa Publications, 2014.
2. Erwin Kreyszig, *Advanced Engineering Mathematics*, John Wiley, 9th Edition, 2012.
3. B.S. Grewal, *Higher Engineering Mathematics*, Khanna Publications, 43rd Edition, 2014.
4. G.B. Thomas, Maurice Weir and Joel Hass, *Thomas' Calculus*, Peterson, 12th Edition, 2010.
5. B.V. Ramana, *Higher Engineering Mathematics*, 23rd reprint, 2015.

Course Code	Course Title				Core / Elective		
BS204CH	Engineering Chemistry (Common to All Branches)				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	3	1	-	-	30	70	4

Course Objectives

- Correlate the properties of materials with their internal structure and use the for Engineering applications
- Apply the principals of electrochemistry in storage of electrical energy in batteries.
- Gains knowledge in causes of corrosion and its prevention.
- Attains knowledge about the disadvantages of hard water for domestic and industrial purposes.
- Also learns the techniques of softening of hard water and treatment of water for drinking purpose.
- Exposed to qualitative and quantitative parameters of chemical fuels.
- Aware eco-friendly materials and processes.

Course Outcomes

On successful completion of this course, students will be able to:

1. Apply concept of electrode potential in identifying feasibility of electrochemical reaction; illustrate electro analytical techniques and working of batteries.
2. Identify the mechanism of corrosion of materials on basis of electrochemical approach and devise corrosion control methods.
3. Estimate the physical & chemical parameters of quality of water and explain the process of water treatment.
4. Explain the influence of chemical structure on properties of materials and their choice in engineering applications.
5. Classify chemical fuels and grade them through qualitative analysis.
6. Relate the concept of green chemistry to modify engineering processes and materials.

UNIT-I

Electrochemistry and Battery Chemistry: Electrochemistry: Electrochemical cells, Electrolytic and Galvanic cells-notation, cell reaction and cell potentials. Types of electrodes, Calomel Quinhydrone and Glass electrodes. Determination of pH of a solution by using Quinhydrone electrode. Thermodynamics of emf of cells, Nernst equation and its derivation. Applications of Nernst equation to electrode potential and emf of cells. Numerical problems.

Batteries: Primary batteries: Zn - Carbon battery. **Secondary batteries:** Pb-Acid battery and Li-Ion battery, Applications. **Flow batteries (Fuel cells):** Methanol-Oxygen fuel cells, Construction, Applications.

UNIT-II

Water Chemistry and Corrosion: Water Chemistry: Hardness of Water-Types and units of hardness, estimation of temporary and permanent hardness of water by EDTA method. Alkalinity of water and its determination. Water softening by Ion exchange and Reverse Osmosis methods. Numerical problems. Specifications of potable water. Sterilization by Chlorination. Break Point Chlorination.

Corrosion: Causes and its effects. Types of Corrosion-Dry or Chemical corrosion and Wet or Electrochemical corrosion and their mechanism. Electrochemical corrosion –Waterline and Pitting Corrosion. Factors influencing rate of corrosion.

Corrosion control methods: Cathodic protection methods - Sacrificial anodic and impressed current methods. Surface coating methods: Hot Dipping-Galvanizing.

UNIT-III

Engineering Materials: Polymers: Basics of terms polymers: Monomer and its functionality, Polymers and degree of polymerization. Classification of polymers - Thermoplastics & Thermosetting resins.

Types of Polymerization (i) Addition (ii) Condensation (iii) Co-Polymerization. Mechanism of free

radical polymerization **Preparation, Properties & Uses of the following polymers:** Plastics - PVC and Bakelite, Fibers - Nylon 6:6, and Kevlar, Elastomers - Buna-S, Butyl and Silicone Rubbers.

Conducting polymers: Introduction, Classification and Mechanism of conduction in Poly-acetylene, Applications of conducting polymers.

Biodegradable polymers: Introduction preparation, properties and applications of polylactic acid

UNIT-IV

Chemical Fuels: Classification of fuels: Introduction, definition and classification of chemical fuels- Primary and secondary fuels. Solid, liquid and gaseous fuels. Requirements of a good fuel. Calorific Value – HCV and LCV. Theoretical calculations of calorific value by Dulong's formula – Numerical problems.

Solid Fuels: Coal and its Ranking. Analysis of coal - Proximate and Ultimate analysis.

Liquid Fuels: Fractionation of Petroleum. Composition and uses of Gasoline, Diesel and Kerosene. Cracking & its Significance- Catalytic cracking by moving bed method, Knocking. Fuel rating – Octane and Cetane numbers.

Gaseous Fuels: LPG, CNG -Composition and Uses.

Combustion: Ignition temperature of a fuel, calculation of air quantities by weight and volume required for combustion of a fuel- Numerical problems.

UNIT-V

Green Chemistry and Composites: Green Chemistry: Concept, Principles of green chemistry – Atom Economy, Catalysis. and examples of clean technology.

Biodiesel: Sources, Concept of Trans esterification and carbon neutrality. Properties and significance **Composites:** Introduction to composites, composition and characteristic properties of composites. Classification of composites based on matrix, reinforcement and ply. Applications of composites.

Suggested Readings:

1. Puri, Sharma and Pathania, *Principles of Physical Chemistry*, S.N. Chand & Co. New Delhi (Latest edition).
2. P C Jain and M Jain, *Engineering Chemistry*, Dhanpat Rai & Sons (15th Edn), New Delhi.
3. J C Kuriacose and J Rajaram, *Chemistry in Engineering and Technology*, TMH, New Delhi.
4. O G Palanna, *Engineering Chemistry*, TMH, New Delhi.
5. S S Dara, *Engineering Chemistry*, S Chand & Sons, New Delhi.
6. Sashi Chawla, *Engineering Chemistry*, Dhanpat Rai & Sons, New Delhi.
7. Shikha Agrawal, *Engineering Chemistry*, Cambridge, New Delhi.
8. Prasanta Rath, *Engineering Chemistry*, Cengage Learning India Pvt. Ltd.

Course Code	Course Title					Core / Elective	
HS151EG	English Lab (Common to All Branches)					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	-	-	-	2	25	50	1
Course Objectives <ul style="list-style-type: none"> ➤ Learn IPA ➤ Learn minimal pairs and types of syllables ➤ Overcome the difficulties with sounds of English ➤ Learn to participate well in gds, Debates and Presentations ➤ Communicate with appropriate body language and expressions Course Outcomes The students will able to <ol style="list-style-type: none"> 1. Learn IPA 2. Learn minimal pairs and types of syllables 3. Overcome the difficulties with sounds of English 4. Learn to participate well in gds, Debates and Presentations 5. Communicate with appropriate body language, expressions 							

1. **Introduction to English Phonetics: Organs of Speech:** respiratory, articulatory and phonatory systems; **Sounds of English:** Introduction to International Phonetic Alphabet; Minimal pairs; Syllable; Word Stress; Introduction of rhythm and intonation; Difficulties of Indians speakers with stress and intonation.
2. **Speaking Activities:** Self Introduction, Picture perception, JAM.
3. Group discussion, Debate, Presentation skills.
4. **Listening Activities:** Listening to different types of materials for effective comprehension.
5. **Role play:** Use of dialogues in a variety of situations and settings.

Suggested Readings:

1. E. Suresh Kumar, a Handbook for English Language Laboratories (with CD).
2. Revised edition, Cambridge University Press India Pvt. Ltd. 2014
3. T. Balasubramanian. A Textbook of English Phonetics for Indian Students. Macmillan, 2008.
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	
BS252CH	Chemistry Lab (Common to All Branches)					Core	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	-	-	-	3	25	50	1.5
Course Objectives							
<ul style="list-style-type: none"> ➤ Conduct experiments, take measurements and analyse the data through hands-on experience in order to demonstrate understanding of the theoretical concepts of quantitative Analysis while working in small group. ➤ Interpret the electro analytical principles with experimental results graphically ➤ Demonstrate writing skills through clear laboratory reports 							
Course Outcomes							
On successful completion of this course, students will be able to:							
<ol style="list-style-type: none"> 1. Apply the principles of Colorimetric and Electrochemistry in quantitative estimations. 2. Estimate the rate constants of reactions from concentration of reactants/ products as a function of time. 3. Synthesize small drug molecules. 							

List of Experiments:

1. Introduction to Chemical Analysis.
2. Techniques of Weighing.

Volumetric Analysis:

3. Preparation of Standard Mohr's salt solution, Standardization of KMnO_4 and estimation ferrous ion.
4. Estimation Iron(II) by Dichromatometry

Water Analysis:

5. Preparation of Standard Magnesium sulphate solution, standardization of EDTA and Estimation of Total Hardness.
6. Preparation of Standard Sodium Carbonate Solution, Standardization of HCl and Estimation of Carbonate and Bicarbonate Alkalinity.

Conductometry:

7. Estimation of HCl
8. Estimation of CH_3COOH and mixture of acids

Potentiometry:

9. Estimation of HCl
10. Estimation of Iron

pH Metry:

Estimation of HCl

Colorimetry:

11. Verification of Beer-Lambert's law and estimation of Manganese.

Chemical Kinetics:

12. Determination of rate constant of acid catalysed hydrolysis of methyl acetate.

Drug Synthesis:

13. Preparation of Aspirin

Note: Minimum ten experiments should be conducted in the semester

Suggested Readings:

1. Senior Practical Physical Chemistry, B.D. Khosla, A. Gulati and V. Garg (R. Chand & Co., Delhi)
2. An Introduction to Practical Chemistry, K. K. Sharma and D.S. Sharma (Vikas publishing, N. Delhi)

Course Code	Course Title				Core / Elective		
ES352ME	Workshop/ Practice (Common to All Branches)				Core		
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	-	-	-	6	50	50	3
Course Objectives							
<ul style="list-style-type: none"> ➤ Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances. ➤ To provide hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field. ➤ To gain a good basic working knowledge required for the production of various engineering products. ➤ To Study different hand operated power tools, uses and their demonstration. ➤ Adopt safety practices while working with various tools 							
Course Outcomes							
<i>The students will able to</i>							
<ol style="list-style-type: none"> 1. Demonstrate an understanding of and comply with workshop safety regulations. 2. Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiselling. 3. Study and practice on machine tools and their operations 4. Undertake jobs connected with Engineering Workshop trades including fitting, carpentry, sheet metal, house wiring, welding, smithy and foundry. 5. Apply basic electrical engineering knowledge for house wiring practice 							

A. TRADE FOR EXERCISES:

1. Carpentry
2. Fitting
3. House wiring
4. Sheet metal working
5. Smithy
6. Welding
7. Plumbing

B. TRADES FOR DEMONSTRATION AND EXPOSURE:

1. Machining (Lathe & Drilling)
2. Injection moulding
3. Mould making and casting
4. Basic Electronics lab instruments

C. PRESENTATIONS AND VIDEO LECTURES

1. Manufacturing Methods
2. Rapid Prototyping
3. Glass Cutting
4. 3D printing
5. CNC LATHE

D. IT WORKSHOP: Computer hardware, identification of parts, Disassembly, Assembly of computer to working condition, operating system installation.

Note: At least two exercises from each trade.

Suggested Reading:

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