

SCHEME OF COURSE WORK

Course Title	: Engineering Chemistry		
Course Code	: 22BC1101	L T P C	3 0 0 3
Program:	: B.Tech.		
Specialization:	: EEE		
Semester	: II		
Prerequisites	: Fundamentals of chemistry		
Courses to which it is a prerequisite	: For CSE, ECE, EEE & IT.		

Course Outcome (CO): After the completion of the course, the student will be able to:

COURSE OUTCOMES (CO s)		LEARNING OUTCOMES
CO 1	Construct electrochemical cells and measure electrode potentials (L3)	1. Illustrate the construction of electrochemical cells. (L3) 2. explain the significance of electrode potentials. (L2) 3. use ion selective electrodes. (L3)
CO 2	Demonstrate the working of energy storage devices (L3)	1. classify different types of batteries. (L2) 2. compare the merits of different cells. (L2) 3. apply redox principles for construction of batteries and fuel cells. (L3)
CO 3	Illustrate various sources of renewable energy and applications of solar energy (L3)	1. discuss different renewable sources of energy. (L2) 2. illustrate the construction of a p-n junction diode. (L3) 3. explain how photovoltaic cells convert light into energy. (L2)
CO 4	Apply different polymers to specific applications (L3)	1. use different types of polymers for various applications (L3) 2. explain the preparation, properties and applications of Bakelite and Nylon-6,6 (L2) 3. describe the role of vulcanisation process in improving the mechanical properties of polymers (L2)

CO 5	Describe the importance of nano materials and molecular machines (L2)	1. explain the synthesis and characterization methods of nano materials. (L2) 2. discuss role of nanomaterials in wastewater treatment and other applications (L2) 3. discuss the concepts of artificial molecular machines (L2)
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Program Outcomes (POs):

A graduate of Electrical and Electronic Engineering will be able to

1	Apply the knowledge of basic sciences and electrical and electronics engineering fundamentals to solve the problems of power systems and drives.
2	Analyze power systems that efficiently generate, transmit and distribute electrical power in the context of present Information and Communications Technology.
3	Design and develop electrical machines and associated controls with due considerations to societal and environmental issues.
4	Design and conduct experiments, analyze and interpret experimental data for performance analysis.
5	Apply appropriate simulation tools for modeling and evaluation of electrical systems.
6	Apply the electrical engineering knowledge to assess the health and safety issues and their consequences.
7	Demonstrate electrical engineering principles for creating solutions for sustainable development.
8	Develop a techno ethical personality that help to serve the people in general and Electrical and Electronics Engineering in particular.
9	Develop leadership skills and work effectively in a team to achieve project objectives.
10	Communicate effectively in both verbal and written form.
11	Understand the principles of management and finance to manage project in multi disciplinary environments.
12	Pursue life-long learning as a means of enhancing the knowledge and skills.

PROGRAMME SPECIFIC OUTCOMES(PSOs):

PSO-1	Specify, analyze power systems that efficiently generate, transmit, distribute via EMS to utilize electrical power and energy.
PSO-2	Understand the principles and construction of Electrical Machines (EM), develop models for the EM and its associated speed controls for their performance through testing.
PSO-3	Analyze, Solve and test electronics and control electric drive systems using the state of the art solid state control and other components and software tools.

Course Outcome-PO matrix**Subject: Chemistry**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	3	2										1
CO-2	3	2										1
CO-3	3	2					2					2
CO-4	3	2										2
CO-5	3	2										3

3 - Strongly correlated, 2 - Moderately correlated, 1 - Slightly correlated

Course outcomes vs Program Specific Outcomes

COs	PSO1	PSO2	PSO3
CO-1	-	-	-
CO-2	-	-	-
CO-3	-	-	-
CO-4	-	-	-
CO-5	-	-	-

Course Outcome-Assessment

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Electrode potential ,type of cells	CO1	Q) Derive the Nernst equation for electrode potential.	□ Lecture / Discussion □ Problem solving	Assignment-I (Week - 4) Midtest-I (Week-8)
2	Construction and working principles of	CO1	Q) Explain the determination of P ^H of solution using	□ Lecture / Discussion □	Assignment-I (Week - 4) Mid test-I

	glass electrode		glass electrode		(Week-8)
3.	Reference electrodes	CO1	Q) Describe the construction and working of Calomel electrode	□ Lecture / Discussion	Assignment-I (Week - 4) Mid test-I (Week-8)
4	Batteries-primary batteries	CO2	Q) Explain the construction and working of Dry cell	□ Lecture / Discussion	Quiz-I (Week-7) Mid test-I (Week-8)
5	Batteries-secondary Batteries	CO2	Q) Describe the principle and working of Lithium ion battery	□ Lecture / Discussion	Quiz-I (Week-7) Mid test-I (Week-8)
6	Fuel cells/ alkaline fuel cells	CO2	Q) Explain the principle and construction of alkaline fuel cell	□ Lecture / Discussion	Quiz-I (Week-7) Mid test-I (Week-8)
7	Sources of renewable energy	CO3	Q) Discuss various sources of renewable energy	□ Lecture / Discussion □	Mid test-I (Week-8)
8	MID TEST-I			□	
9	Physical and chemical properties of silicon, Production of solar grade silicon from quartz	CO3	Q) Discuss few physical & Chemical properties of Silicon and Describe the production of Silicon from quartz.	□ Lecture / Discussion	Assignment-II (Week-12)
10	Silicon Photovoltaic cells	CO3	Q) Explain the principle and construction of Silicon photovoltaic cell	□ Lecture / Discussion	Assignment-II (Week-12) Mid test-II (Week-16)
11	Polymerisation, Types of polymerization and mechanism	CO4	Q) Differentiate addition polymerization from condensation polymerization.	□ Lecture / Discussion	Assignment-II (Week-12) Mid test-II (Week-16)
12	Plastics, types, differences, Synthesis of plastics	CO4	Q) Differentiate thermoplastic and thermosetting	□ Lecture / Discussion	Assignment-II (Week-12)

			polymers		Mid test-II (Week-16)
13	Natural Rubber, Vucanization, Elastomers-preparation, properties and application of synthetic rubber	CO4	Q) Write the chemical structure of natural rubber and explain its vulcanization process	□ Lecture / Discussion	Assignment-II (Week-12) Mid test-II (Week-16)
14	Nanomaterials, Carbon Nano tubes, Fullerenes and Nanoclusters	CO5	Q) Discuss the properties and applications of fullerenes	□ Lecture / Discussion	Quiz-II (Week-15) Mid Test-II (Week-16)
15	Molecular Machines and Molecuar Swtiches	CO5	Q) Explain the applications of Rotaxanes	□ Lecture / Discussion	Quiz-II (Week - 15) Mid Test-II (Week-16)
16	MID TEST -II				
17	END EXAM				