



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Diploma Engineering College
Semester-2

Subject: Basic Chemistry – DETCH12201

Type of course: Major (Core)

Prerequisite: To provide students the knowledge of general organic chemistry.

Rationale: The Prerequisite provides the foundation for understanding the concepts and principles of organic chemistry.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P		Theory Marks		Practical Marks		CA	
			ESE	MSE	V	P	ALA		
4	0	2	5	60	30	10	20	30	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Unit No.	Course content	Hrs	% Weight age
1	Chapter - 1 Basic Concept : Matter , elements, compounds, atoms, molecules, molecular formula, mole concept, Avogadro's number, gram-atomic weight, Gram-molecular weight, equivalent weight, STP, Avogadro's hypothesis and its application, Derivation of general gas equation $PV=nRT$, Dalton's law of partial pressure.	20	30%



	<p>Chapter - 2 Atomic structure : Thomson's model its limitation, Rutherford's model and its limitation, Brief introduction to Bohr's model and its limitation, Concept of shells and subshells, Dual nature of matter and light, De-broglie relationship, Heisenberg uncertainty principle, Modern concept of atomic structure, atomic number, mass number, orbital, concept, quantum numbers, shape of orbital, electron configuration of elements using Auf-bau principle, Hund's rule, Pauli's exclusion principle, isotopes, isobars.</p>		
2.	<p>Chapter - 3 Solutions : Types of solutions, Different methods of expressing strength of solutions, viz. Molarity, Molality, Normality, Formality, Weight percent, Preparation of standard solutions, Vapour pressure and Rault's law, Ideal and non ideal solution, Positive and negative deviation of non ideal solution from Rault's law</p>	10	20%
3.	<p>Chapter - 4 Chemical Bonding : Ionic bonds, Co-valent bonds, Co-ordinate Co-valent bonds, H-bonds, valence, electronic theory of valence, Dot & Lewis formula of elements Valence bond theory(VBT) and geometry of some simple molecules having hybridization of sp^3, sp^2, sp, Valence shell electron repulsion pair theory (VSEPR) with shape of some simple molecules like BeF_2, BF_3, CH_4, PCl_5, Molecular Orbital Theory (MOT) of homo nuclear diatomic molecules like H_2, He_2, O_2, N_2.</p>	15	25%
4.	<p>Chapter - 5 Polymer, Elastomers & Adhesives : Introduction and Definition of Polymer and Monomer, Classification of Polymer on basis of Molecular structure as Linear, Branch and Cross-linked polymers, Classification on basis of monomers(homopolymer and copolymer) basis of Thermal behavior(Thermoplastics & Thermosetting), Types polymerization Reaction, Addition Polymerization, Condensation Polymerization, Synthesis, properties and application of Polyethylene, Polypropylene, Polyvinyl chloride, Teflon, Polystyrene, Phenol formaldehyde, Acrylonitrile, Epoxy Resin, Define the term:- Elastomers, Natural rubber and its properties, vulcanization of rubber Synthetic rubber, Synthesis, properties and uses, Buna-S Rubber, Buna-N Rubber, Neoprene Rubber, Definition of adhesives and Examples, Characteristics of adhesives.</p>	15	25%



Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1.	Picture Analysis Faculty will provide a Scientific picture and student needs to analyze it and make notes related to the same and will upload it on the GMIU web portal.	10
2.	Quiz Faculty will upload the quiz on the GMIU web portal and students needs to attempt all the questions given in the same. (30 MCQs)	10
3.	Field Survey report Faculty will arrange an Industrial Visit for the students and student needs to prepare a report for the same and will upload it on the GMIU web portal.	10
Total		30

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weight age	30%	30%	30%	10%	00	00

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Learn the basic concepts of chemistry and demonstrate different atomic structures.
CO2	Know about the solutions, types of solutions, preparation, and the laws related to it.
CO3	Get the knowledge about bonding, different types of bonds and the theories related to the same.
CO4	Understand the meaning of Polymers, Elastomers and Adhesives. They will also come to know about the different types of the same, their preparations and uses.



List of Practicals:

Sr. No	Descriptions	Unit No.	Hrs
1.	Organic Separations: - Separations can be achieved by differences in physical properties, such as differences in boiling point, or by chemical means, wherein differences in physical properties are enhanced by chemical reactions.	01	20
	Solid X 10	01	
	Liquid X 10	01	
2	Organic Synthesis: - chemical synthesis that involves synthesis of organic molecules in a laboratory.	02	10
	Preparation of acetanilide from aniline.	02	
	Preparation of p-nitro acetanilide from acetanilide.	02	
	Preparation of p-nitro aniline from p-nitro acetanilide.	02	
	Preparation of urea formaldehyde resin.	02	
	Preparation of phenol formaldehyde resin from phenol.	02	
	Total		30

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.



Reference Books:

- 1) Organic Chemistry 6th Edition by I. L. Finar Volume – 1 Pearson Publication.
- 2) Organic Chemistry 7th Edition by Paula Y. Bruice Pearson Publication.
- 3) Organic Chemistry II edition by Bhupinder Mehta and Manju Mehta PHI Learning pvt.Ltd. Delhi.
- 4) Organic Reactions and Mechanism by V.K. Ahluwalia.
- 5) Industrial Chemistry Including Chemical Engineering by B. K. Sharma, Krishna Prakashan Media.

