

Course Title: Chemistry Core-3:Analysis of Oils, Fats, Soaps, Detergents, Essential oils, Paints and Varnishes w.e.f. the session 2023-24 and onwards	
Class: M.Sc. Pt.-II / Semester-III	Course code: MCH-C303
Lectures: 60	Credits : 04
MM: 70	Exam Hours: 03

NOTE: The question paper shall consist of Two sections (Sec.-A and Sec.-B). Sec.-A shall contain 10 short answer (about 150 words) type questions of SIX marks each and student shall be required to attempt any five questions. Sec.-B shall contain 08 descriptive type questions of TEN marks each and student shall be required to attempt any four questions. Both sections shall have questions from the entire syllabus. The previous year paper/model paper can be used as a guideline and the following syllabus should be strictly followed while setting the question paper.

COURSE CONTENTS:

Unit - I

Oils and Fats: General idea, Classification, Occurrence, Basic idea of the function of oils and fats, Physical and chemical properties of oils and fats, Applications of oils and fats.

Soaps and detergents : Idea of common soaps, Cleansing action of soaps, Varieties of soaps and their uses, Idea of detergents, Hazards of soaps and detergents.

Unit - II

Analysis of oils and fats: Determination of physical constants like M.P. and B.P., Specific gravity, Refractive index, Total volatile matter, Determination of Acid value, Iodine value, Saponification value, R.M. value and Polenske number.

Unit - III

Analysis of soaps and detergents: Determination of Matter insoluble in alcohol, Free alkali and free acids, Matter insoluble in water, Glycerol content (Dichromate method), Foaming capacity and its comparison in different samples of soaps and detergents, Effect of sodium carbonate on the foaming capacity of soap.

Unit - IV

Essential Oils: Introduction, nomenclature, constituent terpenoid. Isolation, separation of terpenoids from essential oils. General properties of terpenoids. Isoprene & Special Isoprene rule, Gem-dialkyl rule, Classification of terpenoids, Citral, Geraniol, Nerol, Linalool and Menthol, including constitution.

Unit - V

Paints, Varnishes and Lacquers: General introduction of organic protective coatings, Essential ingredients of paints, Important functions of a pigment, a filler, a vehicle, a thinner, extenders, solvents and diluents, film forming materials and binders, distampers, plastisizers, emulsion paints, oil paints, epoxy paints, alkyd resins, phenolic resins, urea-formaldehyde and malamine-formaldehyde resins. Lacquers, drying, oxidative drying, curing, stoving, coatings, cold curing coatings. Various defects on paint surfaces and their rectification.

Suggested Readings:

1. Methods of Sampling and Test for oils and fats, I.S.I, New Delhi
2. Methods of Sampling and Test for soaps and detergents, I.S.I, New Delhi
3. Organic Chemistry by Kapoor, Singh and Mukherjee
4. Organic Chemistry of Natural Products Vol. I and II by: Chatwal
5. Chemistry in Engineering and Technology by: Kuriacose and Raja Ram

COURSE OBJECTIVES:

1. General idea of Oils, Fats, Soaps and detergents

2. Analysis of Oils, Fats, Soaps and detergents
3. Essential oils
4. Paints, Varnishes and Lacquers

COURSE OUTCOMES:

On completion of this course, student shall be able to:

CO 1: Gain fundamental knowledge on basics of chemistry involved in the oils/ fats especially in context of drying Oils. Implement different modes of derivatizations of oils/ fatty acids along with studying the basic process of analysis of oils\ fats.

CO 2: Understand the basics of soaps, surfactants and detergents and Able to explain the composition of soaps and detergents. Interpret the effect of use of new generation of surfactants in formulation and comment on quality standards of soaps, surfactants and detergents.

CO3: Learn the isolation and extraction process along with properties and chemical synthesis of some bio-active natural products. Explain the general methods in structure determination of terpenoids. Understand the fundamental knowledge on perfumery chemicals with an extended application in the field of pharmaceuticals.

CO 4: Classify different types of organic coatings on the basis of its properties and applications. Understand fundamental knowledge on basics of chemistry involved in the Paints. Summarize various defects, their causes and cure surfacing out on application of different paints.

Mapping of Course outcomes (COs) with Programme outcomes (POs)

Course outcomes/ Programme outcomes	1	2	3	4	5	6	7	8
CO 1	X		X			X		X
CO 2	X		X			X		X
CO 3	X		X					X
CO 4	X		X			X		