

UNIVERSITY OF MUMBAI

No. UG/73 of 2018-19

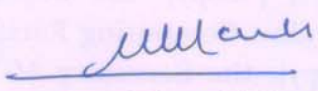
CIRCULAR:-

Attention of the Principals of the affiliated Colleges and Directors of the recognized Institutions in Science & Technology Faculty is invited to this office Circular Nos. UG/156 of 2016-17, dated 16th November, 2016 relating to syllabus of the Bachelor of Science (B.Sc.) degree course.

They are hereby informed that the recommendations made by the Board of Studies in Chemistry at its meeting held on 28th May, 2018 have been accepted by the Academic Council at its meeting held on 14th June, 2018 **vide** item No. 4.41 and that in accordance therewith, the revised syllabus as per the (CBCS) for the Chemistry of T.Y.B.Sc. Physical Chemistry, Inorganic Chemistry, Organic Chemistry and Analytical Chemistry (Sem - V & VI) (3 and 6 Units) including Applied Component Drugs and Dyes, Heavy Fine Chemicals and Petrochemicals has been brought into force with effect from the academic year 2018-19, accordingly. (The same is available on the University's website www.mu.ac.in).

MUMBAI – 400 032

To ^{6th June, 2018}
6th July


(Dr. Dinesh Kamble)
I/c REGISTRAR

The Principals of the affiliated Colleges & Directors of the recognized Institutions in Science & Technology Faculty. (Circular No. UG/334 of 2017-18 dated 9th January, 2018.)

A.C./4.41/14/06/2018

No. UG/ 73 -A of 2018

MUMBAI-400 032

^{6th June, 2018}
6th July

Copy forwarded with Compliments for information to:-

- 1) The I/c Dean, Faculty of Science & Technology,
- 2) The Chairman, Board of Studies in Chemistry,
- 3) The Director, Board of Examinations and Evaluation,
- 4) The Director, Board of Students Development,
- 5) The Co-Ordinator, University Computerization Centre,


(Dr. Dinesh Kamble)
I/c REGISTRAR

T.Y.B.Sc. Applied Component

SEMESTER V

PETROCHEMCALS

COURSE CODE: USACPET501

CREDITS: 02

LECTURES: 60

Unit-I

.1 The Chemistry of Petroleum Kingdom. (2L)

1.1.1 Compounds of Straight Run Gasolines.

1.1.2 Kerosene and Gas Oil Fractions.

1.1.3 Non-hydrocarbon Constituents

1.2 PETROLEUM EXPLORATION & PRODUCTION. (7L)

1.2.1 Introduction

1.2.2 Formation of Oil and Gas

1.2.3 Characteristics of crude oils

1.2.4 Oils & Gas Exploration

1.2.5 Drilling for Oil and Gas

1.2.6 Production of Crude oil and Natural gas

1.3 Petroleum Products (6L)

1.3.1 Liquefied Petroleum Gases (Composition, properties, extraction & Uses.)

1.3.2 Naphthas (Composition, Manufacture, properties & Uses.)

1.3.3 Kerosene (Composition, properties, extraction & Uses.)

1.3.4 Diesel Fuel (Composition, Properties & Uses)

Unit-II

2.1 INORGANIC CHEMICALS FROM PETROLEUM. (6L)

2.1.1 Sulphur byproducts

2.1.2 Hydrogen

2.1.3 Petroleum coke

2.1.4 Nitrogen compounds

2.2 REFINERY PROCESSES AND PRODUCTS.

2.2.1 Chemical Composition (2L)

2.2.2 Distillation – separation based on relative volatilities – fractions obtained with flow sheet diagrams. (2L)

2.2.3 Conditions of conversion processes (catalyst, temperature, pressure etc.) Mentioned below

–Pyrolysis, Catalytic cracking and hydrocracking, Isomerization, Alkylation, Reforming (5L)

Unit-III

3. PREPARATION OF PETROCHEMICALS

3.1 From Propylene: (3L)

Isopropanol, cumene, glycerin, and acrylonitrile

3.2 From acetylene: (4L)

Vinyl chloride, Chloroprene, acrylonitrile and acetaldehyde

3.3 From C4 – hydrocarbons : (3L)

Butadiene, isobutene and butane

3.4 From aromatic hydrocarbon: (5L)

Aniline, chlorobenzene ,D.D.T, Xylene,

Unit-IV

4. Alternative sources for Fuels

4.1 Natural Gas (CNG) (3L)

4.2 Propane, Hydrogen & Alcohols (5L)

4.3 Biofuels (3L)

4.4 Other Fuels (2L)

4.5 Wind and solar Energy (2L)

PRACTICALS

SEMESTER V

PETROCHEMICALS

COURSE CODE: USACPET5P1

CREDITS: 02

I- APPLIED Experiments:

- Determination of Specific gravity and viscosity of Oil
- To check the quality of Petrol
- To check the quality of Diesel

II-Experiments (Demonstration):

- i) Cloud point
- ii) Pour point
- iii) Aniline point

III-Preparations:

1. Nitrobenzene to Dinitrobenzene.
2. Hydroquinone to Benzoquinone
3. Succinic acid into Succinic anhydride (Sublimation method)

SEMESTER VI

PETROCHEMICALS

COURSE CODE: USACHFC601

CREDITS: 02

LECTURES: 60

Unit-I

1.1 Chemicals from C₃, C₄ and Higher Alkanes

- 1.1.1 Products from Propane (5L)
- 1.1.2 Chemicals from Propylene.
- 1.1.3 Derivatives of hydrocarbons Higher than Butanes.

1.2. General study of the following reactions used in petrochemical industry (10L)

1. 2.1 Oxidation
1. 2.2 Ammoxidation
1. 2.3 Hydroformylation (oxo reaction)
1. 2.4 Hydration of olefins
1. 2.5 Chlorination
- 1.2.6 Polymerization (free radical and ionic)

Unit-II

2.1 Sources of higher olefins and aromatic hydrocarbons secondary materials from petrochemicals with flow sheet diagrams. (5L)

2.2. UNIT OPERATIONS (10L)

- 2.2.1 Extraction
- 2.2.2 Filtration
- 2.2.3 Crystallization

- 2.2.4 Drying
- 2.2.5 Evaporation
- 2.2.6 Cooling

Unit-III

3.1 INDUSTRIAL CHEMICALS (7L)

- 3.1.1 Plastic: polyvinyl chloride, polystyrene.
- 3.1.2 Synthetic elastomers- styrene, Butadiene rubber, polychloroprene, nitrile rubber.

3.2 SYNTHETIC DETERGENTS (8L)

- 3.2.1 Introduction of Soap and Detergents
- 3.2.2 Classification of detergents
- 3.2.3 Surface active agents
- 3.2.4 Wetting agents
- 3.2.5 Emulsifying agents
- 3.2.6 Preparation of Dodecyl Benzene sulphate.
- 3.2.7 Finishing of Detergents

Unit-IV

Environmental pollution control in petroleum refineries

4.1 Air pollution (6L)

- 4.1.1 Introduction
- 4.1.2 Air Pollutants from refining operation
- 4.1.3 Air Pollution control technique

4.2 Water Pollution (6L)

- 4.2.1 Introduction of water pollution
- 4.2.2 Types of water pollution
- 4.2.3 Control of water pollution in petroleum refining.
- 4.2.4 Study of various parameters of polluted water.

4.3 Land Pollution (2L)

4.4 Carbon Credit (1L)

PRACTICALS

SEMESTER VI

PETROCHEMICALS

COURSE CODE: USACHFC6P1

CREDITS: 02

I- Experiments

1. Determination of acid number of an oil.
2. Determination of acidity and alkalinity of given hydrocarbon
3. Estimation of Formaldehyde from given formalin sample

II- Applied Experiments (Demonstration): -

- i) Flash /fire point
- ii) Calorific value of a fuel
- iii) Steam Distillation

III – Preparations:

- i) Benzoylation of β -naphthol
- ii) Phthalic anhydride to phthalimide
- iii) Cinnamic acid to dibromo cinnamic acid

IV- Industrial visit: Industrial visit report is to be incorporated in the journal

References:

1. Advanced Petroleum Refining, G. N. Sarkar
2. Petroleum Refining Technology, Dr. Ram Prasad
3. Petroleum Industries Technology and Process, Chhitta Ranjan Lahiri, Dipa Biswas.
4. A Text Book on Petro Chemicals, Dr. B. K. Bhaskararao.
5. A. I. Vogel: Text book of Quantitative Analysis including Instrumental Analysis.
6. A. I. Vogel: Text book of Quantitative Organic Analysis.
7. Advanced Practical Organic Chemistry 3rd Edition, N.K. Vishnoi, Vikas Publication,
8. Practical Organic Chemistry by Mann and Saunders.
9. Vogel's Textbook of Quantitative Chemical Analysis 5th Edition
10. Vogel's Qualitative Inorganic Analysis 5th Edition