

**VEER NARMAD SOUTH GUJARAT UNIVERSITY**  
**M.Sc. Semester-III (ORGANIC CHEMISTRY)**  
**SYLLABUS TO BE EFFECTIVE FROM JUNE 2019**

**PAPER-III (Organic Chemistry in Industry)**

**Max. Marks: 100 (External - 70 + Internal - 30)**

**Total Periods: 45**

**UNIT-I ORGANIC CHEMISTRY IN INDUSTRY (12 Periods)**

**Introduction, Process Chemistry versus Research Chemistry**

Pharmaceutical Industry: Drug Discovery, Drug development, Preclinical and clinical testing, Medicine, Future Problems and Opportunities

Agrochemical Industry: Classification, Biodegradable and Persistent Pesticides, Toxicity, Chemical Classification of Pesticides-Herbicides and Insecticides

**UNIT-II BASIC CONCEPTS OF DYE AND DYE INTERMEDIATES (11 Periods)**

Introduction of Dyes and Pigments, Absorption of visible light, colour of wavelength absorbed, complementary colour. Relation between color and chemical Constitution, Witt's theory, Armstrong's theory, Nietzki's theory, Valence bond theory, Molecular orbital theory, Fastness Properties, Exhaustion and fixation properties| Natural Dyes, Nomenclature of Dye Intermediates, Colour Index

Classification of Dyes: Based on structure, based on mode of application to fibres, Non-Textile uses of dyes: Dyes in medicine, leather, paper, colour photography and electro photography, food, cosmetics, displays and laser dyes.

**UNIT-III BASIC CONCEPT OF DRUGS (11 Periods)**

Introduction, Classifications: On the basis of their chemical structure and therapeutic action, Nomenclature: Proprietary and Non-proprietary name, Nomenclature of new drugs by WHO, Names of drugs: Generic and brand names

Theories of drug action: Occupancy theory, Rate theory and induced fit theory Biological defence, chemical defences, Furguson principle

Absorption of drugs: Routes of administration, factors that affect on absorption

Physico chemical properties: Solubility, Partition coefficients, Ionization constant, Electronic effect, Steric effect, Stereochemical consideration

**UNIT-IV UNIT PROCESSES (11 Periods)**

**(i) Nitration:** Nitrating agents. Mechanism of aromatic nitration. Industrial chemicals derived from Benzene, Naphthalene, Anthracene using Nitration.

**(ii) Sulphonation and Sulfation:** Sulphonating and Sulfating agents. Mechanism of aromatic Sulphonation. Industrial chemicals derived from Benzene, Naphthalene, Anthracene using Sulphonation.

**(iii) Amination:** Aminating agents, Amination by reduction, Amination by Ammonolysis. Industrial chemicals derived from Benzene using Amination.

**(iv) Alkylation:** Alkylating agents. Industrial important alkyl compounds derived by various routs

**(v)Halogenation:**Halogenating agents. Industrial important halogenated compounds derived by various routs

**Reference Books Recommended**

1. Organic Chemistry: A Mechanism Approach; Penny Chaloner, CRC Press, Tailor and Francis; Florida.
2. Pharmaceutical Process development: Current Chemical and Engineering Challenges, J. Blacker and M. T. Williams, RSC Cambridge, UK.
3. Fine Chemicals: The Industry and Its Business, P. Pollak, 2nd Edition, Wiley.
4. The chemistry of synthetic Dyes, Vol. I to VII by Venkataraman, Academic Press, New York.
5. Chemistry of Synthetic Dyes & Pigments by Lubs.
6. Dyes and their intermediates by E. N. Abrahart.
7. Handbook of synthetic dyes and pigments, Vol. I & II by K. M. Shah.
8. Industrial Dyes by Klans Hunger, Germany by Wiley-VCH.
9. Development in the Chemistry and technology of Organic Dyes by J.Griffiths, Blackwell Sci. Pub., Oxford, London.
10. Principles of colour Technology by Fred W. Billmeyer and Max Saltzman, John Wiley & Sons.
11. Medicinal Chemistry by G. R. Chatwal.
12. A textbook of Pharmaceutical Chemistry by Jayshree Ghosh.
13. Chemical Process Industries by R. N. Shreve.
14. Riegel's Hand-Book of Industrial Chemistry, Ed. by James A. Kent.
15. Industrial Chemicals by Faith, Keyes, Clark.