

Name of the Programme: M.Sc. Part-II (Organic Chemistry)

Course Code: CHO-600 **Title of the course:** Practical Course in Organic Chemistry-III

Number of Credits: 4

Effective from AY: 2023-24

Prerequisites for the course	Should have studied organic chemistry practical course at M.Sc. Part-I.	
Course Objective	1. To translate certain theoretical concepts learnt earlier into experimental knowledge 2. To provide hands-on experience of laboratory techniques required for organic syntheses, organic mixture separations and purification.	
Content	1. Organic ternary mixture separation (<i>Minimum 10 experiments of 6h each</i>) Three component mixture separation based upon differences in the physical and the chemical properties of the components. Elemental and functional group analysis, determination of physical constant and derivative preparation-its recrystallization and melting point/boiling point of any one compound.	No of hours 60
	2. Organic synthesis (Any Six) a. Benzophenone oxime to benzanilide (Beckmann rearrangement) b. Benzil to hydrobenzoin (NaBH ₄ reduction) c. Diels - Alder reaction of anthracene and maleic anhydride using microwave irradiation d. Friedel- Crafts acylation of anisole e. 2-methyl benzimidazole from <i>o</i> -phenylene diamine f. Dicoumarol from coumarin derivative g. Halogenation using NBS: preparation of 9-bromoanthracene (or benzylic bromides) h. Resolution of racemic phenyl ethylamine using tartaric acid i. Ferric chloride oxidative coupling of 2-naphthol to [1,1'-binaphthalene]-2,2'-diol j. Dimedone from mesityl oxide (Dieckmann condensation) k. KMnO ₄ oxidation of toluene assisted by microwave l. 2-phenylindole from acetophenone (Fisher indole synthesis)	36
	3. Polarimetry and column chromatography (Any 4 experiments of 6h from 'sections a and b') a. Enantiomeric excess by Polarimetry Determination of optical rotation and enantiomeric excess of enantiomers and unknown mixtures of: i. Amino acids	24

	<ul style="list-style-type: none"> ii. Drugs iii. Carbohydrates iv. Other readily available Chiral compounds <p>b. Purification of organic compounds by column chromatography</p> <ul style="list-style-type: none"> i. Mixture of ortho and para nitrophenols ii. Mixture of benzil and benzoin iii. Mixture of acetophenone and benzylideneacetophenone iv. Mixture of benzophenone and benzanilide v. Other Chiral natural product mixtures 	
Pedagogy	Students should be given suitable pre- and post-lab assignments and explanations revising the theoretical aspects of laboratory experiments prior to the conduct of each experiment.	
References /Readings	<ol style="list-style-type: none"> 1. A. I. Vogel, A. R. Tatchell, B. S. Furniss, A. J. Hannaford, Vogel's Textbook of Practical Organic Chemistry, 5th Ed., Prentice Hall, 2011. 2. N. K. Vishnoi, Advanced Practical Organic Chemistry, South Asia Books, 2010. 3. K. Tanaka, Solvent-free Organic Synthesis, 2nd Ed., Wiley-VCH, 2009. 4. L. F. Fieser, K. L. Williamson, Organic Experiments, 7th Ed., D. C. Heath, 1992. 5. K. L. Williamson, K. M. Masters, Macroscale and Microscale Organic Experiments, 6th Ed., Cengage Learning, 2010. 6. R. K. Bansal, Laboratory Manual in Organic Chemistry, 5th Ed. New Age International, 2016. 7. S. Delvin, Green Chemistry, Sarup & Sons, 2005. 8. O. R. Rodig, C. E. Bell Jr., A. K. Clark, Organic Chemistry Laboratory Standard and Microscale Experiments, 3rd Ed., Saunders College Publishing, 2009. 9. J. Mohan, Organic Analytical Chemistry, Narosa Publishing House, 2014. 10. G. J. Shugar, J. T. Ballinger, Chemical Technicians Ready Reference Handbook, McGraw-Hill, Inc. 1996. 11. D. P. Shoemaker, Experimental Physical Chemistry, McGraw-Hill, 1989. 	
Course Outcome	<ol style="list-style-type: none"> 1. Students will be in a position to perform separation of organic components based on chemical nature, solubility and boiling points. 2. Students will be in a position to understand stoichiometric requirements in organic syntheses. 3. Students will be able to monitor progress of reaction by chromatographic techniques. 4. Students will be able to carry out purification of reaction products by column chromatography. 	