

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
INSTRUCTION DIVISION
SECOND SEMESTER 2015-2016
Course Handout Part II

Date: 5 January 2016

In addition to part-I (General handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course Number : CHEM F242

Course Title : Chemical Experimentation I

Instructor-in-charge : ANIL KUMAR

Team of Instructors : Ajay Kumar Sah, Bharti Khungar, Dalip Kumar, Madhushree Sarkar, Paritosh Shukla, Anoop Singh, B Pallavi, Devesh S Agarwal, Ganesh M Shelke, Hitesh Kumar Saini, Khandagale S Bhausaheb, Khima Pande, Meenakshi Pilania, Moyna Das, Mukund P. Tantak, Pinku, Ramaraju, M Abdul Shakoor, Saroj, Sunita, V Arun, Vaishali, Venkataramana P O

1. Course Description: This course is based on laboratory experiments in organic chemistry. This course is available for second year M. Sc. Chemistry students.

2. Scope and Objective: The main objective of the course is to provide students with a first-hand experience about basic techniques used in an organic chemistry laboratory. Broadly, the experiments include qualitative organic analysis, detection of known and unknown functional groups, preparation and recrystallization of derivatives, chemical separation of mixture of two compounds, examples of single step and two-step organic syntheses, extraction of organic compounds from natural sources or from drugs, chromatographic separation of pure compound from a mixture obtained in a multistep reaction, etc.

3. Text Book(s): Vogel's Textbook of Practical Organic Chemistry, 5th Ed.

4. Reference Book: Reference sources for each experiment will be specified as necessary.

5. Course Plan: The students will perform a number of experiments in qualitative, synthetic organic chemistry including single-step and multi-step synthesis, extraction of natural products, and training in chromatographic separation, with an emphasis on individual planning and execution of the experiments.

Topic	Experiment	No. of classes
Qualitative Analysis of Organic Compounds	1. Elemental (N, S & Halogen) analysis	2
	2. Functional group analysis of organic compounds	4
	3. Complete analysis of unknown organic compound by derivatization, m.p. determination and spectral (IR, ¹ H NMR) analysis.	4
	4. Chemical separation and analysis of a mixture of two unknown organic compounds	2

Single-step synthesis	5. Selective reduction of organic compound using sodium borohydride	1
	6. Multicomponent reaction (Biginelli Reaction)	1
	7. Cycloaddition reaction (Diels-Alder Reaction)	1
	8. Synthesis using microwave irradiation (Coumarin)	1
	9. Synthesis using grinding technique	1
	10. Glucosazone synthesis	1
Multi-step Synthesis	11. Synthesis of benzilic acid from benzaldehyde	2
	12. Separation/purification of one compound obtained from single/multistep synthesis of known mixture.	1
	13. Separation of racemic mixture (Resolution)	1
Extraction	14. Isolation of curcumin from <i>curcuma longa</i>	1
Estimation	15. Quantitative estimation of sugar	1

In each synthesis experiment melting point, IR, and TLC will be carried out.

6. Marks Distribution for Laboratory Class:

Attendance and punctuality	:	1
Laboratory performance and quiz	:	3
Writing experiment in note book and record book	:	4

7. Evaluation:

Component	Duration	Weightage (%)	Date and Time	Remarks
Overall Laboratory Performance (As per point 6)	3 hr	50	Continuous	-
Laboratory Tests I and II	--	30	To be announced	-
Comprehensive Quiz Exam	1 hr	20	To be announced	-

8. Notice: All notices concerning the course will be displayed on Notice Board of the **Department of Chemistry** only.

9. Make-up for laboratory classes is strictly discouraged and will be given only for genuine reasons.

Instructor In-charge
CHEM F242