

**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**  
**INSTRUCTION DIVISION**  
**SECOND SEMESTER 2013-2014**  
**Course Handout Part II**

**Date:** 06/01/2016

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 F341  
**Course Title** : Chemical Experimentation II  
**Instructor-in-charge** : RAM KINKAR ROY  
**Team of Instructors** : Subit Kumar Saha, Saumi Ray, Inamur R Laskar, Prashant U. Manohar, Shamik Chakraborty  
Aabid Hamid, Archana Choudhary, Ashok Sharma, Bijoya Das, Fayaz Baig, Pankaj Nehra, Sunita Kumari, Sushila Kumari, Dinesh Kumar, Noorullah Baig Md, Nisar Ahmed Mir, Rajinder Shivan, Roshan Nazir, Parvej Alam, Sachin Chaudhary, Santosh Kumari, Sheik Saleem Pasha, Sonam Sharma

**1. Course Description:** This course is targeted to build laboratory skills for students by exposure to a bunch of different kinds of experiments covering principles and theories taught in the program. The course folds in experiments with macroscopic level methodologies, validation of various chemistry theories, as well as abstract electronic structure theory considering molecular-level events. The course is normally available to students of third year and higher levels.

**2. Scope and Objective:** The main objective of the course is to expose the students to various experimental methods commonly used in Chemistry. The students will carry out a set of experiments in the areas of analytical chemistry, inorganic chemistry, nanochemistry, physical chemistry, and theoretical/computational chemistry.

**Techniques to experience:** Includes but not limited to Inorganic synthesis techniques, Separation techniques based on phasic composition, Analytical techniques such as UV-Vis spectroscopy (both usual and fiber-optics based devices), FTIR spectroscopy, Spectrofluorimetry, Viscometry, Potentiometry, Conductometry, Gravimetry, Titrimetry, Basic computation techniques towards understanding of electronic structure etc.

**3. Text Book(s):** Laboratory Manual

**4. Further reading:** (i) Quantitative inorganic analysis by A. I. Vogel; (ii) P. W. Atkins' Physical Chemistry Book.

**5. Course Plan:**

Topic	Experiment	No. of Classes
Computational chemistry	Electronic structure calculation	1
	Determination of potential energy surface	2
Materials science and Catalysis	Syntheses and characterization of nanomaterials	2
	Application of nanomaterials in catalysis	
Analytical chemistry	Separation of ions from a mixture by ion-exchange	2
Electrochemistry	Application of potentiostat for an electrochemical reaction	1

Coordination chemistry	Syntheses and characterization of transition metal complexes	2
	Investigation of linkage isomerism	
Chemical kinetics	Exploration of a Clock reaction	1
Thermodynamics	Estimation of heat of solution	1
	Phase equilibria	1
Supramolecular chemistry	Determination of critical micelle concentration (CMC) employing conductance and fluorescence measurements	2
	Determination of isoelectric point of macromolecule using viscosity measurement	1
Kinetic Theory of Gases	Maxwell velocity distribution	1
Colligative property	Freezing point depression	1

## 6. Evaluation:

Component	Duration	Weightage (%)	Mode
Laboratory Work & Reports (240)	-	80	Continuous
End semester evaluation* (60)	-	20	-

\* Project followed by *viva*/presentation : 3-5 classes.

**7. Make-up policy:** Make up would be considered only for **genuine cases** against appropriate application

**8. Notice:** All notices concerning the course will be displayed on the **Chemistry Department Notice Board and/or Nalanda.**

**9. Lab. safety:** It is **MANDATORY** to wear personal protective equipments (PPE) in wet laboratory, such as ***Lab-coat, Covered shoes, and Safety goggles (as applicable).***

**STUDENTS WON'T BE ALLOWED TO PERFORM ANY EXPERIMENT WITHOUT PPE**

**Ram Kinkar Roy**  
**Instructor-in-charge**  
**CHEM F341**