ARSD College, University of Delhi

Model Course Handout/Lesson Plan

Course Name : B.Sc. Industrial Chemistry						
Semester	**Course Code**	**Course Title**	**Lecture (L)**	**Tutorial (T)**	**Practical (P)**	**Credit (C)**
VI	Course Code: 32173901	IT Skills For Chemists			4	2
Teacher/Instructor(s)		Dr. Nidhi Dureja and Dr. Preeti Chaudhary				
Session		2021-22				

Objectives:

The objective of this course is to introduce the students to fundamental mathematical techniques and basic computer skills that will help them in solving chemistry problems. It aims to make the students understand the concept of uncertainty and error in experimental data. It acquaints the students with different software for data tabulation, calculation, graph plotting, data analysis and document preparation.

Course Learning Outcomes:

By the end of the course, the students will be able to:
 • Become familiar with the use of computers
• Use software for tabulating data, plotting graphs and charts, carry out statistical analysis of the data.
• Solve chemistry problems and simulate graphs.
• Prepare documents that will incorporate chemical structure, chemical equations, mathematical expressions from chemistry.

Detail of course

1. Potting graphs using a spreadsheet i. Planck's distribution law ii. Radial distribution curves for hydrogenic orbitals, Maxwell-Boltzmann distribution curves as function of temperature and molecular weight iv. van der Waals isotherms v. Data from phase equilibria studies

2. Calculations using spreadsheet vi. Rate constants from concentration- time data vii. Molar extinction coefficients from absorbance data viii. Numerical differentiation (e.g. handling data from potentiometric and pH metric titrations) ix. pKa of weak acid

3. Preparing a word processing document having tables, chemical structures and chemical equations

Details of the Lab Course		
Session	**Name of Experiment**	**Contact Hours**
1	*Experiment 1:* **Write an Application/Letter using MS word**	**4**
2	*Experiment 2:* **Draw marksheet using MS word**	**4**
3	*Experiment 3:* **Write 10 equations with Equation Editor**	**4**
4	*Experiment 4:* **Prepare a project Report in MS Word**	**4**
5	*Experiment 5:* **Make table of available data in spreadsheet.**	**4**
6	*Experiment 6:* **(i) Make a table of Sine, Cosine, Tangent, Cosecant, Secant and Cotangent values**	**8**
7	*Experiment 7: Make a Log table*	**8**
8	*Experiment 8:* **Do Numericals on Rate constant Data**	**8**
9	*Experiment 9:* **Draw graphs for Eutectic mixture**	**8**
10	*Experiment 10:* **Draw graphs for pH meter and CST**	**8**
	Total	**60**

Suggested Books:

1. McQuarrie, D.A. (2008), Mathematics for Physical Chemistry University Science Books.

2. Steiner, E.(2008),The Chemical Maths Book Oxford University Press.

3. Yates, P.(2007),Chemical calculations, CRC Press.

4. Harris,D.C.(2007),Quantitative Chemical Analysis. Freeman, Chapters 3-5.

5. Levie, R. de. (2001), How to use Excel in analytical chemistry and in general scientific data analysis, Cambridge Univ. Press.

6. Venit, S.M. (1996), Programming in BASIC: Problem solving with structure and style. Jaico Publishing House.

Evaluation Scheme:

No.	Component	Duration	Marks
1.	Internal Assessment • Quiz • Class Test • Attendance • Assignment		25
2.	End Semester Examination	4 hr	25
		Total marks	50