



**DEPARTMENT OF CHEMISTRY
UNIVERSITY OF LUCKNOW
LUCKNOW**

**Ph.D. Course work Syllabus
PAPER I: Research Methodology**

Maximum Marks: 100
Written Examination: 70
Internal Assessment: 30

- 1. Safety, Hazards and Precautions in Laboratory**
 - a. Brief idea about toxicity, explosive nature and ill effects of various chemicals generally used in research and precautions to handle them.
- 2. Research Report:** Format of the research report, style of writing the report, references and bibliography.
- 3. Purification Techniques**
 - a. A brief knowledge about various techniques such as distillation, fractional distillation, crystallization, fractional crystallization.
 - b. Chromatography
 - i. Column
 - ii. TLC
 - iii. Paper
- 4. Data Analysis as per IUPAC and Association of Analytical Chemists'(AOAC) protocol**
 - a. Errors in chemical analysis, Repeatability and reproducibility, classification of errors, determination of accuracy of methods, improving accuracy of analysis, significant figures, mean, mode, median, standard deviation, comparison of results: T-test, F-test and Chi-square test, Rejection of results, presentation of data
- 5. Computer Basics and Application**
 - a. Introduction to basic software
 - i. MS Word,
 - ii. Power Point,
 - iii. Excel,
 - b. Introduction to Chemistry related software
 - i. Gaussian,
 - ii. Gaussview,
 - iii. ChemDraw
 - c. Introduction to Databases
 - i. SciFinder,
 - ii. Scopus,
 - iii. Cambridge Structural Database