

Research Methodology	
Unit I	<p>a) Fundamental Laboratory Techniques: Basic principles, Health and safety, Working with liquids, Basic laboratory procedures I & II, Principles of solution chemistry, pH and buffer solutions.</p> <p>b) The investigative approach: Making and recording measurements, SI units (International System of Units) and their use, Scientific method and design of experiments, Project work. Collection of Data (primary, secondary), literature survey & review.</p>
Unit II	<p>a) Analysis and presentation of data: Using graphs, Presenting data in tables, Hints for solving numerical problems, Descriptive statistics, Choosing and using statistical tests, drawing chemical structures, Chemometrics, Computational chemistry.</p> <p>b) Statistical Packages for Social Science (SPSS) Workshop.</p>
Unit III	<p>a) Chemical safety: General safety and operational rules, Safety equipments, Personal protective equipments, Compressed gas safety, Safety practices for disposal of broken glassware, Chemicals, Centrifuge safety, Treated biomedical wastes and scientific ethics.</p>
Unit IV	<p>Disaster Management: Emergency response to: Chemical spills, Radiation spills, Biohazard spills, Leaking compressed gas cylinders, Fires, Medical emergency, Accident reporting (Bhopal gas tragedy, Chernobyl three mile island).</p>

Reference Books:

1. J. R. Dean, A. M. Jones, D. Holmes, R. Reed, J. Weyers and A Jones, Practical Skills in Chemistry, Pearson Education Ltd. [Prentice Hall], 2002.
2. C. R. Kothari, Research Methodology: Methods and Techniques, New Age International, 2013.
3. A. K. Singh, Tests, Measurements and Research Methods in Behavioral Sciences, Bharti Bhawan Publisher And Distributor, 2012.
4. Martyn Denscombe, The Good Research Guide, McGraw-Hill International, 2007.
5. Ranjit Kumar, Research Methodology, Sage Publication Ltd, 3rd Edition, 2011.
6. Edited by J.C. Taylor, Advances in Chemistry Research, Vol 17, Nova Science Publishers INC, 2013.
7. Oklahoma State University Laboratory Safety Manual, 1999.
8. Margaret Diane LeCompte, Wendy L. Millroy, Judith Preissle, The Handbook of Qualitative Research in Education, Academic Press Inc
9. Bohdan O, Szuprouiez, Multimedia Networking, McGraw-Hill
10. Introduction to Research, Tynes Hillway Houghton Wiffin Company, 2005.