Ph.D. Course

Research Methodology in Chemistry (Theoretical)

1. **Safety, Hazards and Precautions in Laboratory**

   Brief idea about toxicity, explosive nature and ill effects of various chemicals generally used in research and precautions to use them.

2. **Purification of Chemicals**

   An idea about LR, GR and AR Grade Chemicals, A brief knowledge about various techniques such as distillations, fractional distillation crystallization, chromatography etc.

3. **Data Analysis :**

   Errors in chemical analysis, classification of errors, determination of accuracy of methods, improving accuracy of analysis, significant figures, mean, standard deviation, comparison of result: T-test, F-test and Chi-square test, rejection of results, presentation of data.

4. **Sampling**

   Introduction, definition, theory of sampling, Technique of sampling, statistical creation of good sampling and required size: stratified sampling vs. Random sampling. Minimizations of variancs in stratified sampling, Transmission and storage of samples.

5. Structure elucidation of spectral data (IR, UV, NMR, ESR and Mass)