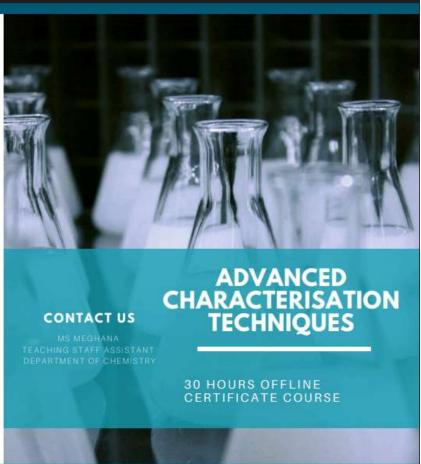
An interactive program on the latest trends and advanced characterisation techniques in the field of science

- · FTIR
- BET SURFACE AREA ANALYSER
- · PCR
- XRD
- · GC



# TITLE – ADVANCED CHARACTERISATION TECHNIQUES.

### **Course Objectives:**

- 1. Provide hands-on training in the operation and handling of advanced characterization instruments.
- 2. Familiarize participants with the principles and applications of Photocatalytic reactor, X-ray diffractometer, BET Surface area analyser, Gas Chromatography, FTIR, and Thermogravimetric analyser.
- 3. Enhance participants' skills in interpreting data obtained from advanced instruments for the characterization of various organic and inorganic compounds.
- 4. Prepare participants for research and industrial roles requiring proficiency in advanced characterization techniques.

5. Foster a deeper understanding of the significance of advanced characterization in the context of global advancements in science and technology.

**Learning Outcomes**: By the end of the course, participants will be able to:

- 1. Operate and handle Photocatalytic reactor, X-ray diffractometer, BET Surface area analyser, Gas Chromatography, FTIR, and Thermogravimetric analyser proficiently.
- 2. Understand the underlying principles behind each characterization technique and its applications.
- 3. Analyze and interpret data obtained from advanced instruments to characterize organic and inorganic compounds effectively.
- 4. Apply advanced characterization techniques in research and industrial settings to enhance the quality of work.
- 5. Appreciate the importance of staying updated with global advancements in advanced characterization techniques.

Course Content: Session 1: Introduction to Advanced Characterization Techniques

- Overview of advanced characterization instruments
- Importance of advanced characterization in research and industry

Session 2: Hands-on Training with Photocatalytic Reactor

- Principles and operation of Photocatalytic reactor
- Practical demonstration and hands-on exercises

Session 3: X-ray Diffractometer

- Principles of X-ray diffraction analysis
- Data interpretation and applications in material characterization

Session 4: BET Surface Area Analyser

- Theory of BET analysis
- Practical demonstration and interpretation of surface area data

Session 5: Gas Chromatography

- Fundamentals of gas chromatography
- Sample preparation, injection techniques, and data analysis

Session 6: Fourier Transform Infrared Spectroscopy (FTIR)

- Introduction to FTIR spectroscopy
- Spectral interpretation and applications in compound identification

### Session 7: Thermogravimetric Analyser

- Basics of thermogravimetric analysis
- Interpretation of thermal degradation profiles and applications

### Session 8: Data Analysis and Interpretation

- Statistical analysis of characterization data
- Case studies and real-world applications

## Session 9: Applications of Advanced Characterization Techniques

- Case studies showcasing the use of advanced techniques in various fields
- Future trends and advancements in advanced characterization techniques

#### Session 10: Hands-on Practice and Assessment

- Recap of learned techniques
- Practical exercises and assessment of participants' proficiency

This course is designed to provide a comprehensive understanding of advanced characterization techniques through a blend of theoretical knowledge and hands-on experience, enabling participants to become proficient in utilizing these techniques in their research and professional endeavors.