



National University of
Sciences and Technology

Three Days Workshop on Advanced Characterization Techniques for Professionals

23rd-25th April, 2019



School of Chemical & Materials
Engineering (SCME)

Registration Form

1. Name: _____
2. Designation: _____
3. CNIC #: _____
4. Organization _____
5. Address: _____
6. Phone#: _____
7. E-mail: _____
8. Qualification: _____

9. Pay Order/ Bank Draft/ Remittance Slip
Attached: _____

10. Date: _____

11. Signature: _____

For Official Use Only:

1. Registration # & Date: _____
2. Pay Order/ Bank Draft/Remittance Slip Number
& Branch number #: _____

Registration Fee

Students Rs. 5,000

Professionals Rs. 15,000

Registration deadline: 05th April, 2019

Organizing Committee

Dr. Arshad Hussain (Dean/ Principal SCME)

Dr. Abdul Qadeer Malik

Dr. Tayyaba Noor

Contact Person: Dr. Tayyaba Noor

E-mail: tayyaba.noor@scme.nust.edu.pk

Phone #: +92-51-90855121

Venue: SCME, NUST, Campus, H-12, Islamabad,

Profile of School

School of Chemical and Materials Engineering (SCME) commenced its programs in 2006, and is currently offering undergraduate and postgraduate degree programs in the twin disciplines of Chemical Engineering and Materials Engineering. Internationally recognized faculty, coupled with well equipped state-of-the-art labs and learning resources, provide an ideal setting for professional growth. SCME has a strong tradition of holding workshops and seminars on contemporary topics of interest.

About the Department

A special feature of Chemical Engineering Department of SCME is that it provides quality education and research in the field of energetic materials besides traditional chemical engineering fields. The aim of department is to bridge the gap between theory and practical knowledge. The department is well equipped with several sophisticated equipment to conduct the research in thrust areas.

Scope of Workshop

The purpose of this workshop is to orient the participants to the basic principles and applications of FT-IR, HPLC, VOD meter, TG/DTA, GC-MS, XRD, SEM, AFM and Elemental Analyzer. It would also initiate lively discussion between scientists and researchers and enable them to share their knowledge and strike collaboration in the areas of chemical engineering. The beginners will get a chance to familiarize themselves with the recent developments in the areas of above techniques. The workshop includes lectures and hands-on training on research equipment.



High Performance Liquid Chromatography (HPLC)

HPLC is used to separate, identify, and quantify each component in a mixture. Its common applications includes Food Environmental, Pharmaceutical, Energetic Materials and Chemical.



Fourier Transform Infrared Spectroscopy (FT-IR)

FT-IR is used to determine chemical bonds by producing the infrared absorption spectrum that is like a molecular fingerprint. It can be used to Identify functional groups & Molecular structure.



VOD Meter

VOD meter is used to measure the velocity at which a detonation wave progresses through an explosive.



Elemental Analyzer (EA)

Elemental Analyzer is used for determination of carbon, hydrogen, nitrogen, sulfur and oxygen content in organic and other types of materials. Its applications includes oil-related products food & combustion analysis



Gas Chromatograph-Mass Spectrometer (GC-MS)

GC-MS is a technique for the qualitative and quantitative analysis of organic volatile and semi-volatile compounds. GC-MS is used to analyze, VOCs, Petrochemicals and Energetic materials

Thermogravimetric / Differential Thermal Analysis

TGA is used to determine mass loss or gain due to loss of volatiles and decomposition. DTA is an analytical technique to determine thermal and kinetic properties of sample. It is used to study the thermal behavior of organic & Inorganic compounds, Pharmaceuticals, polymers and Energetic Materials.



UV- Visible Spectroscopy

UV-Vis absorption spectroscopy is the measurement of the attenuation of a beam of light after it passes through a sample or after reflection from a sample surface. UV-Vis is used for the study of structure elucidation of organic compounds, quantitative and qualitative analysis and chemical kinetics. Common applications are; Pharmaceuticals, Food industries, paint, petrochemical and defense industry.

X-Ray Diffraction (XRD)

XRD is an analytical technique used for phase identification of a crystalline material and can provide information on unit cell dimensions. Its common applications areas are geology, environmental, materials science, engineering and biology .



Atomic Force Microscopy (AFM)

AFM is used to analyze the surface of a rigid material all the way down to the atomic level, surface topography and properties. Common application areas are Biochemistry, Chemistry and Nanotechnology.



Scanning Electron Microscopy (SEM)



SEM is a type of electron microscope that images a sample by scanning it with a high-energy beam of electrons in a faster scan pattern. Common applications are materials science, forensics, electronics and biological sciences.

Workshop Program Day 1

Time	Event	Mode	Instructor
10:00	Registration and Inauguration		
10:30	Tea break		
11:00	TG/DTA	Lecture	Dr.A.Q .Malik
12:00	GC	Lecture	Dr. T. Noor
13:00	Lunch Break		
14:00	MS	Lecture	Dr.A. Q. Malik
15:00	TG/DTA,GC-MS Lab		

Workshop Program Day 2

9:00	FTIR	Lecture	Dr. T. Noor
10:00	VOD	Lecture	Dr. A. Q .Malik
11:00	XRD	Lecture	Dr. I. H. Gul
12:00	HPLC	Lecture	Dr. T. Noor
13:00	Lunch Break		
14:00	FTIR, VOD , XRD, HPLC Lab		

Workshop Program Day 3

9:00	UV-Visible	Lecture	Dr. T. Noor
10:00	SEM	Lecture	Dr. K. Yaqoob
11:00	AFM	Lecture	Dr. Aftab Akram
12:00	Elemental analyzer	Lecture	Dr. Habib Nasir
13:00	Lunch Break		
14:00	UV Visible, SEM, AFM, Elemental analyzer Lab		
16:00	Distribution of Certificates		