



বিদ্যাসাগর বিশ্ববিদ্যালয়  
**VIDYASAGAR UNIVERSITY**  
**Department of Chemistry**

Dr. Sumita Roy

January 04, 2023

**Proceedings of the Emergency Departmental Committee (D.C.) meeting held on  
04.01.2023 at 1 pm.**

**Members Present:**

Prof. Sumita Roy, Head, Department of Chemistry, in the chair  
Prof. Ajay Kumar Misra  
Prof. Sudipta Dalai  
Prof. Subal Chandra Manna  
Dr. Maidul Hossain  
Dr. Anirban basu

**Agenda:**

Organization of STUTI program under DST-STUTI Program of IIT (ISM) Dhanbad.

**Resolution:**

HoD reported to the members of the DC that Indian Institute of Technology, Dhanbad wish to organize a One-week Hands-on Training Program at the Department of Chemistry, Vidyasagar University under Synergistic Training program Utilizing the Scientific & Technological Infrastructure (STUTI) funded by Department of Science & Technology (DST), Govt. of India. The members of the DC were enthusiastic to organize the STUTI program and unanimously accepted the proposal. In this context, the members of the DC selected the title of the training program and prepared a list of tentative schedules and topics to be covered within this program are as follows::


**Title: Applications of Multifaceted State of the Art Techniques in Modern Chemistry**

**List of tentative schedules and topics:**

ACTIVITY	DELIVERABLES
Circular Dichroism Spectrometer (DST-FST Supported)	Circular dichroism spectroscopy (CD) is the technique of choice to study chiral molecules in solution, in particular biologically important molecules such as proteins, nucleic acids, carbohydrates, and therapeutic drugs. An important application of CD spectroscopy is the determination of the equilibrium dissociation constant, $K_d$ , of binding interactions between a macromolecular host and a ligand. It also exploits the fundamental property described by the 'Cotton Effect'. A detailed one-to-one demonstration will help the participant learn the minute details and its unique specialty over other available techniques.
Isothermal Calorimeter (DST-FST Supported)	Isothermal titration calorimetry (ITC) is a physical technique used to determine the thermodynamic parameters of interactions in solution. It is most often used to study the binding of small molecules (such as medicinal compounds) to larger macromolecules (proteins, DNA etc.) Measuring heat transfer during binding enables accurate determination of binding constants ( $K_D$ ), reaction stoichiometry (n), enthalpy ( $\Delta H$ ) and entropy ( $\Delta S$ ). This provides a complete thermodynamic profile of the molecular interaction. The participants will learn the theory and working Principles of the instrument. A full live demo on operation and analysis techniques will be demonstrated.

Steady state Fluorescence Spectrophotometer	Fluorescence spectroscopy is routinely used for studying structural changes in conjugated systems, aromatic molecules, and rigid, planar compounds due to alterations in temperature, pH, ionic strength, solvent, and ligands. Its applications include excitation and emission scans, synchronous scans and maps, steady-state fluorescence anisotropy, excitation-emission maps, kinetic measurements, and temperature maps. The researchers will learn the Fundamental and theoretical concept of fluorescence spectroscopy. A full live demo on operation and analysis techniques will be demonstrated.
Rheometer	A rheometer is a laboratory device used to measure the way in which a dense fluid (a liquid, suspension or slurry) flows in response to applied forces. It is used for those fluids which cannot be defined by a single value of viscosity and therefore require more parameters to be set and measured than is the case for a viscometer. It measures the rheology of the fluid. It measures the stress-strain relationship to understand the flow/deformation properties of a material. The participants will learn the theory and working Principles of the instrument. A comprehensive live demo of the operation and analysis techniques will be demonstrated.
NMR Spectrophotometer (DST-FST Supported)	NMR spectrometers are used to test atomic and molecular properties of a sample (e.g. physical and chemical). It is used to determine structure of proteins, amino acid profile, carotenoids, organic acids, lipid fractions, the mobility of the water in foods. The participants will learn the theory and working Principles of the instrument. A full live demo on operation and analysis techniques will be demonstrated.
Atomic Force Microscope and Scanning Electron Microscope (DST-FST Supported)	The AFM can be used to image the topography of soft biological materials in their native environments. It can also be used to probe the mechanical properties of cells and extracellular matrices, including their intrinsic elastic modulus and receptor-ligand interactions. Scanning electron microscopy is an analytical testing method that captures high resolution images of objects as small as 15 nanometers. It is used to learn more about the composition and topography of man-made and naturally occurring materials such as microscopic organisms, crystalline structures. The participants will learn the theory and working Principles of these two instruments. A full live demo on operation and analysis techniques will be demonstrated.
Computational Chemistry (DST-FST Supported)	Calculations on molecules based on quantum mechanics, once a mere novelty, are now poised to complement experiments as a means to uncover and explore new chemistry. The most important reason for this is that the theories underlying the calculations have evolved to the point at which a variety of important quantities, among them molecular equilibrium geometry and reaction energetics can be obtained with sufficient accuracy to actually be of use. Also important are the spectacular advances in computer hardware that have been made during the past decade. Taken together, this means that good theories can now be routinely applied to real systems. The purpose of this workshop is to guide the participants to the field of computational chemistry. The hands on training using a specific quantum mechanical software will be given to help them to address real chemical problem of their interest.

The meeting ended with vote of thanks to everybody.



Sumita Ray  
 Head  
 Department of Chemistry  
 VIDYASAGAR UNIVERSITY  
 Midnapore-721102, W.B., INDIA

MIDNAPORE – 721 102, WEST BENGAL, INDIA