A Report

Hands on Training program on Sophisticated Analytical Instruments

31st October - 7th November, 2022

Under

Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI), DST, Govt. of India

Organised by

Department of Chemical Sciences
and
Sophisticated Analytical Instrumentation Centre (SAIC), Tezpur University

In collaboration with

Sophisticated Analytical Instrumentation Facility (SAIF),
Panjab University, Chandigarh

सत्यमेव जयते
Department of Science and Technolog
Government of India

आज़ादी का अमृत महोत्सव

CONTENTS

ORGANIZING COMMITTEE

Chief Patron

Prof. Dhruba K. Bhattacharyya Vice-Chancellor Tezpur University	

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Dr. Shyamal K. Das Dept. of Physics Tezpur University	
Dr. Pranjal K. Gogoi Dept. of Applied Sciences Tezpur University	

STUTI Coordinator-PMU

Prof. Ganga Ram Chaudhary Department of Chemistry Director, SAIF/CIL Panjab University, Chandigarh	
Mr. Bunty Sharma (AMRSC) Commonwealth Fellow, University of Nottingham, UK DST INSPIRE, Senior Research Fellow Panjab University, Chandigarh	

INAUGURAL PROGRAMME SCHEDULE

VENUE:* *COUNCIL HALL, TEZPUR UNIVERSITY, NAPAAM

TIME	PROGRAMME
9:30 AM-10:00 AM	***REGISTRATION***
10:00 AM-10:03 AM	***INVITING THE GUESTS TO THE DAIS (Vice Chancellor, Dean R&D, Dean SoS, Programme Coordinators)***
10:03 AM-10:05 AM	***LIGHTENING OF LAMP***
10:05 AM- 10.07 AM	***TEZPUR UNIVERSITY ANTHEM***
10:07 AM-10:12 AM	***WELCOME ADDRESS BY THE CONVENOR FORMAL WELCOME***
10:12 AM-10:25 AM	***ADDRESS BY THE HON'BLE VICE-CHANCELLOR, TEZPUR UNIVERSITY PROF. D. K. BHATTACHARYYA***
10:25 AM	***UNVEILING OF TRAINING PROGRAM BOOKLET***
10:27 AM-10:40 AM	***ADDRESS BY DEAN, R&D, TEZPUR UNIVERSITY Prof. Dhanapati Deka***
10: 40 AM- 10:50	***ADDRESS BY DEAN, SoS, TEZPUR UNIVERSITY Prof. Debajit Hazarika***
10:50 AM-10:55 AM	***VOTE OF THANKS Dr. Rajib Biswas***
10:55 AM-10:57 AM	***NATIONAL ANTHEM***
11:00 AM	***HIGH TEA***

TEZPUR UNIVERSITY, NAPAAM, ASSAM

Tezpur University, one of the premier higher education institutions of India with NAAC grade A+, was established on January 21, 1994 as per Tezpur University Act, 1993. As per Act, the university is fully residential and unitary in nature and is located in the middle of Assam at a distance of 200 km from Guwahati. Having commenced its academic journey with offering of a meagre 3 academic programmes (MCA, M.Sc in Mathematics and Diploma in English Language Teaching), it currently offers 69 academic programmes under the Schools of Engineering (7 Departments), School of Humanities and Social Sciences (9 Departments), School of Management (2 Departments), School of Sciences (5 Departments) and 3 Centers (Centre of Inclusive Development, Centre for Women Studies and Centre for Distance & Online Education).

At present approx. 5000 students including international students from countries like Sri Lanka, Thailand, Ethiopia, Palestine, Bangladesh, Syria, Botswana, and Sierra Leone, approx. 290 faculty and 270 staff are on rolls of the University.

Since its inception, University has embraced semester system having curricula allowing cafeteria approach for electives with credits and grading mechanisms. Further, it has now made smooth transition from Cafeteria approach to CBCS and outcome-based curriculum framework.

Over past 27 years, the University has created impressive expansion of its physical infrastructure (buildings, classrooms, teaching & research labs, library, sports, computer clusters, ICT infrastructure, Wi-Fi etc.). The 261.47 acre meticulously developed green campus of the University provides residential facilities and a conducive ambience for its students, scholars and faculty hailing from different parts of the country.

As a result of well qualified dedicated faculty and committed staff, the University has been able to develop capacities of human resource with global competencies and quality research output of international standards. University has also earned the reputation of carrying out interdisciplinary/multidisciplinary research having relevance to societal needs. The wide range of extension and outreach activities undertaken by the university has shown its commitment towards developmental imperatives of the region.

The alumni of the University have already created a niche for themselves and their Alma Mater occupying responsible positions in various MNCs, PSUs, government departments, educational & research institutions, media houses, consultancy houses, etc.

Due to its impressive academic credentials, the University has become a sought-after destination for students, faculty and staff in the country and in particular NE region.

Vision

- To develop human excellence and inculcate leadership through hard work and Creativity.

The University is striving to achieve its goal through quality teaching learning and research and has been successful in contributing to building capacities of human resource for the nation.

The University is continuously striving to become one of the leaders in teaching, research and innovation, not only in the nation, but also among the higher educational institutions of the world.

In order to achieve this sacred vision, the University has set the mission statements.

Mission

The mission statement of the University is-

- To render Tezpur University one of the most preferred destinations of students, faculty and scholars and employees.
- To be in the Top 50 Universities of the world

विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY
सत्यमेव जयते

DEPARTMENT OF SCIENCE AND TECHNOLOGY
MINISTRY OF SCIENCE AND TECHNOLOGY
GOVT. OF INDIA

Department of Science & Technology (DST) was established in May 1971, with the objective of promoting new areas of Science & Technology (S&T) and to play the role of a nodal department for organizing, coordinating and promoting S&T activities in the country. The Department has major responsibilities for specific projects and programmes such as Formulation of policies relating to Science and Technology, Matters relating to the Scientific Advisory Committee of the Cabinet (SACC), etc.

The R&D Infrastructure Division of the Department aims to strengthen the S&T infrastructure of the country by fostering well-equipped R&D labs in the academic/research institutes/universities as well as a strong culture of research collaboration between institutions and across disciplines.

SYNERGISTIC TRAINING PROGRAMME UTILIZING THE SCIENTIFIC AND TECHNOLOGICAL INFRASTRUCTURE (STUTI)

Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI) Program of The Department of Science & Technology (DST), Government of India, is Intended to Build Human Resource and Its Knowledge Through Open Access to S & T Infrastructure Across the Country by organizing specialized training programs on DST-supported R&D equipment targeting Ph.D. Scholars, Post-Doctoral Fellows, Scientists, Faculty, etc. are actively involved in intensive research.

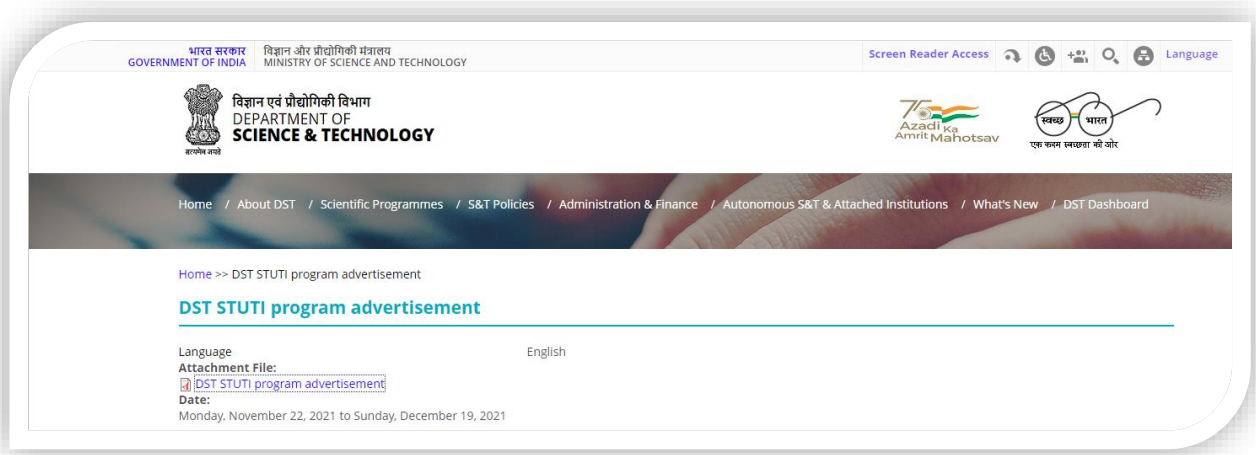
As a complement to the various schemes of DST funding for expansion of R&D Infrastructure at academic institutions, STUTI scheme envisions a hands-on training program and sensitization of the state-of-the-art equipment as well as towards sharing while ensuring transparent access of S&T facilities.

The training will be conducted on a hub-and-spoke model approach. The Department of Science and Technology as the apex body will identify an Institute that shall function as a Project Management Unit (PMU). The hubs will essentially be Organizations having availed projects under FIST/ PURSE/ CURIE/ SAIF/ SATHI schemes. The PMU then shall act as a hub further identify host institutes/ departments in the catchment areas for coordinating and imparting the training in a smooth and efficient manner.

The program is being organized as part of Azadi ka Amrit Mahotsav. The program consists of both theory and as well as hands on experience with various instruments, supported by DST. The uniqueness of the program includes minimum four hours' theory and remaining 50% of the duration is on practical training on the equipment. Effort would be made for hands-on use of equipment for demonstration/ characterization by each participant. The program's aim is to promote the research collaborations to the maximum extent. The program will be open to a broad audience interested in acquiring in-depth knowledge on the ideas and advancements in areas of SEM, XRD, AFM, UV Visible spectroscopy, FTIR, Raman, TGA/DSC, etc. After completion of the workshop, participants can appreciate how these techniques help in understanding materials, correlating structure-property relation and eventually for elucidating the structure of

existing and newly discovered materials. This will not only enable them to build up a

fundamental thought process of characterization techniques but also help in interpreting their own research findings more efficiently. This training program provides a platform for interaction and exchange of innovative ideas on current trends in the fields of Science and Technology, with talks by eminent people in the field.



SOPHISTICATED ANALYTICAL INSTRUMENTATION FACILITY (SAIF), PANJAB UNIVERSITY, CHANDIGARH

SAIF, Panjab University, Chandigarh, formerly known as RSIC at Panjab University Chandigarh was incepted in the earlier years of the 6th plan. The complete facilities of SAIF, CIL and UCIM are working in unison in the service of research and also for imparting practical training to the students through workshops. The Centre also undertakes the design, fabrication and repair of electronic instruments required by students and teachers from the University and the colleges around. It also runs training programmes in technical skills for the benefit of scientific community and associated laboratory staff from different institutions.

The Centre houses the following Sophisticated Instruments: Transmission Electron Microscope (TEM) Hitachi (H-7500), Scanning Transmission Electron Microscope (SEM) Model JSM6100 (Jeol) with Image Analyser, Elemental Analyser for CHN (Thermo Scientific), FT-NMR Cryo-magnet Spectrometer 400 MHz (Bruker), X-ray Diffractometer (Powder Method). Panalyticals X. Pert Pro, LC-MS Spectrometer Model Q-ToF (Micro Waters), Liquid Nitrogen Plant Stirling (StirLIN-1), FTIR Spectrophotometer Model RZX (Perkin Elmer), UV-VISNIR Spectrophotometer Model Lambda 750 (Perkin Elmer), WD-XRF Spectrometer ModelS8 (TIGER Bruker).

DEPARTMENT OF CHEMICAL SCIENCES
TEZPUR UNIVERSITY

Department of Chemical Sciences is one of the most active departments of Tezpur University. Decorated by well-trained and extremely motivated faculty as well as bright students, the department constantly strives to maintain a culture of excellence in research and uphold the highest standards in chemical education. The Department of Chemical Sciences was started in the year 1997. The Department has been offering Ph.D. in Chemical Sciences, M.Sc., integrated M.Sc. and integrated B.Sc./B.Ed. program in Chemistry. The Department is housed with 17 research laboratories, 7 general laboratories, 5 sophisticated laboratories, 7 classrooms, one conference and one seminar hall. All the classrooms, conference hall and seminar hall are ICT enabled. This Department is supported by DST-FIST and UGC-SAP (DRS-II).

Faculty members are actively engaged in high quality research in different areas of Chemical Sciences (e.g. Polymer Chemistry & Nano Composite, Green Chemistry & Catalysis, Bioinorganic Chemistry, Surfactant Systems & Water Purification, Organic Synthesis & Medicinal Chemistry, Computational Chemistry & Molecular Modelling, Pharmaceutical crystallization & Crystal Engineering and Crystallography) as well as interdisciplinary topics. There are several international collaborative projects are going on apart from many national collaborative projects. Few faculty members are also running Industry and Govt. consultancy projects. External funds are received from funding agencies like DST, UGC, CSIR, DBT, DAE, AICTE etc.

There are several sophisticated instruments housed in the Department, e.g. 400 MHz NMR spectrophotometer, Fluorescence Spectrophotometer, GCMS, Polarizing Microscope, CHN Analyzer (FIST Funded), Compression Molding Machine, Universal Testing Machine (UTM), Rheometer, Thermal Analyzer (FIST Funded), FTIR spectrophotometer, UV-Visible Spectrophotometer, Cyclic Voltammeter etc. Two high end servers cater the needs of the computational chemistry researchers.

The Department has also been conducting several outreach activities in Assam and outside Assam.

Our alumni are well placed across the globe and have contributed significantly in their

respective domains.

Vision

Department of Chemical Sciences, Tezpur University seeks to be recognized as the best chemistry department in India with acknowledged excellence in research, teaching, and outreach.

Mission

The mission of the department is to provide high quality academic environment and to perform cutting edge research in different areas of chemical sciences. An integral part of our mission is to make our knowledge publicly available through publications, scientific and public presentations, conferences in combination with high-quality teaching and training of graduate and postgraduate students.

SOPHISTICATED ANALYTICAL INSTRUMENTATION CENTRE (SAIC), TEZPUR UNIVERSITY

Instrumental methods of analysis are an indispensable aspect of research and development. Tezpur University has a number of departments and centres working in diverse areas that require sophisticated analytical equipment. **Sophisticated Analytical Instrumentation Centre (SAIC)**, Tezpur University, has been set up to cater to these needs. The Centre extends these facilities not only to users in the university, but also to other educational institutions and industries in the north-east region and beyond, as many do not have the resources to procure and maintain such sophisticated instruments. The Centre also provides demonstration of instruments and their utility in different fields of research to the UG/PG students of different colleges.

The Centre was established in 2010 with only two (02) equipment – High Performance Liquid Chromatography (HPLC) and Gel Permeation Chromatography (GPC). Twenty-five (25) types of equipment including Transmission electron Microscope (TEM), Scanning Electron microscope (SEM), Single Crystal XRD, Powder XRD, BET (Surface and Pore size analyser), Raman Spectrometer, Fourier Transform Infrared Spectrometer (FTIR), Atomic Absorption Spectrometer (AAS), Nuclear Magnetic Resonance Spectroscopy (NMR), and Bomb Calorimeter are currently housed and maintained by SAIC. The centre also focuses on installing many sophisticated equipment like XPS, HR-MS, Confocal Microscope, etc. in the near future.

The facilities of SAIC are also utilized for imparting practical training to the students through training programmes and workshops.

Major Facilities and Equipment available at SAIC, TU

SN	Equipment	Model	Date of Installation
1	Transmission Electron Microscope	Make: FEI Company, USA Model: FEI 200KV TEM model Tecnai G2 F20 S-TWIN	22.10.2013
2	BET Surface Analyzer	Make: Quantachrome, USA	15.06.2011

		Model: ASiQC0000-4	
3	Powder X-ray Diffractometer	Make: Bruker AXS, Germany Model: D8 Focus	02.11.2012
4	Single Crystal X-Ray Diffractometer	Make: Bruker, Germany Model: AXS SMART APEX-II	04.07.2012
5	High Performance Liquid Chromatography	Make: Waters Corporation, USA a. UV/Visible Detector-2489 b. Refractive Index Detector-2414 c. HPLC Pump-515	08.06.2011
6	Gel Permeable Chromatography	Make: - Waters Corporation, USA a. UV/Visible Detector-2489 b. Refractive Index Detector-2414 c. HPLC Pump-515	09.06.2011
7	Atomic Absorption Spectrometer	Make: Thermo Scientific, UK Model: (a) AAS-ICE 3500	18.09.2012
8	Raman Spectrometer	Make: Renishaw, United Kingdom Model: inVia (514 Lase)	12.10.2012
9	Fourier Transform Infrared Spectrometer	Make: Perkin Elmer Model No.: Spectrum 100	29.01.1998
10	CHN Analyzer	Make: Perkin Elmer, USA Model No.: 2400 Series 2	24.09.2006
11	Thermal Analyzer (TGA-DSC)	Make: SHIMADZU (Asia Pacific) Model No.:TGA-50 & DSC-60	26.05.2006
12	Nuclear Magnetic Resonance Spectrometer	Make: JEOL, Japan Model: ECS-400	08.04.2010
13	Scanning Electron Microscope	Make: JEOL, Japan Model: JSM 6390LV	18.11.2008
14	UV-Visible Spectrometer	Make: Shimadzu Corporation, Japan Model: UV 2450,206-55672-34	13.06.2008
15	X-Ray Diffractometer	Make: Rigaku Corporation,	18.10.2006

		Japan Model: MINIFIEX	

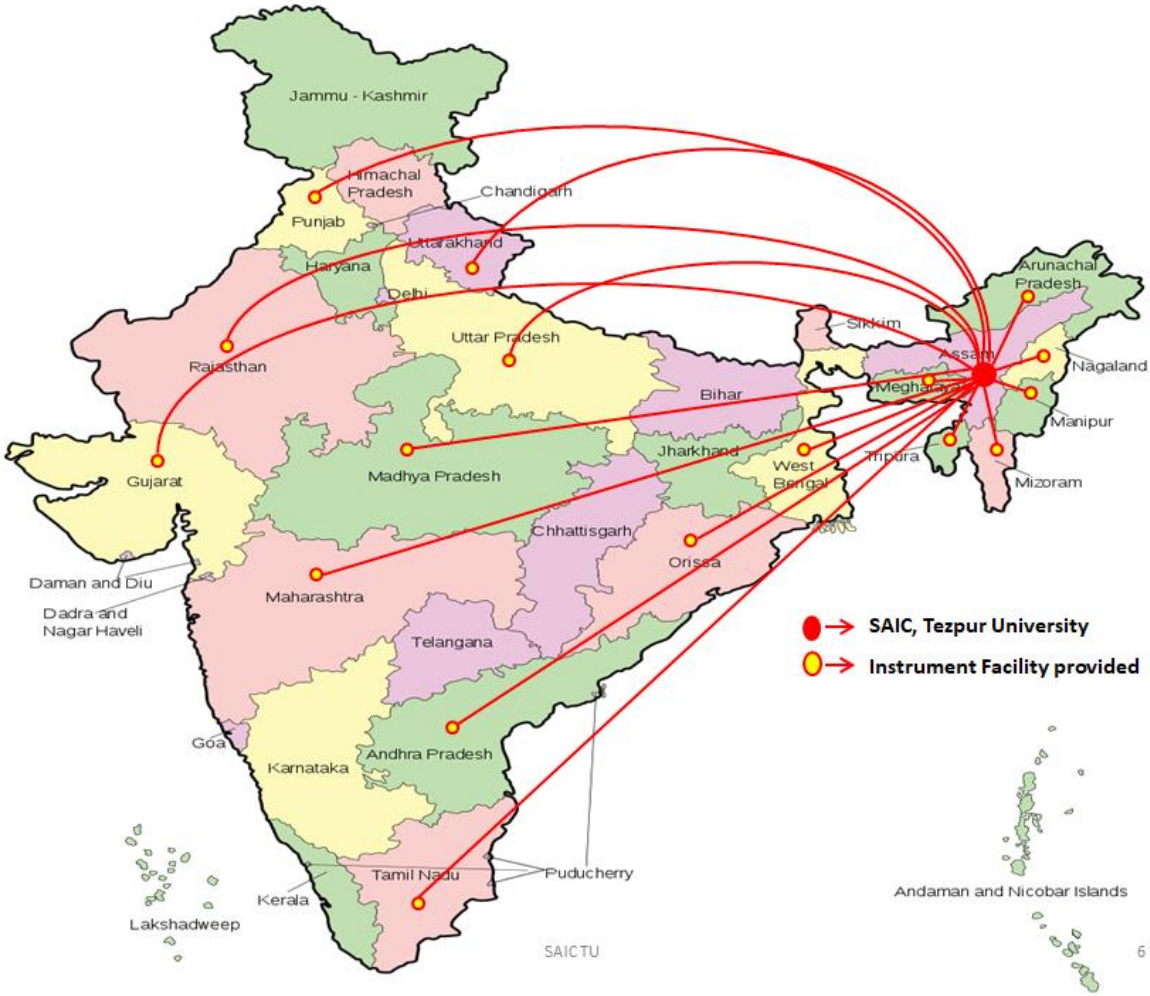
Events Organized (*For the period from April 01, 2021 to March 31, 2022 only) by SAIC, TU*

Title of Event	Level	Date/Period	Mode of Conduct
Training & Demonstration of TEM instrument	Local	29.03.2013 -30.03.2013	Offline
Presentation on Fast SAXS studies of Sensitive Biological samples	Local	08.06.2017	Offline
Advancement of Mechanical Measurement and Analysis	Local	27.11.2017	Offline
Technical Presentation on Small Angle X-Ray Scattering (SAXS) system	Local	04.09.2018	Offline
RAMAN Spectrometer	Local	11.03.2019	Offline
Dynamic Light Scattering	Local	19.02.2020	Offline
Training on Analytical Instruments	Local	09.03.2021- 15.03.2021	Offline

Staff Members

Designation	Name
Head	Prof. Pabitra Nath
Technical Officer	Dr. Ratan Boruah
Technical Assistant	Prakash Kurmi
Technical Assistant	Nava Kr. Gogoi
Technical Assistant	Tridip Ranjan Nath
Multitasking Staff	Mohendra Das

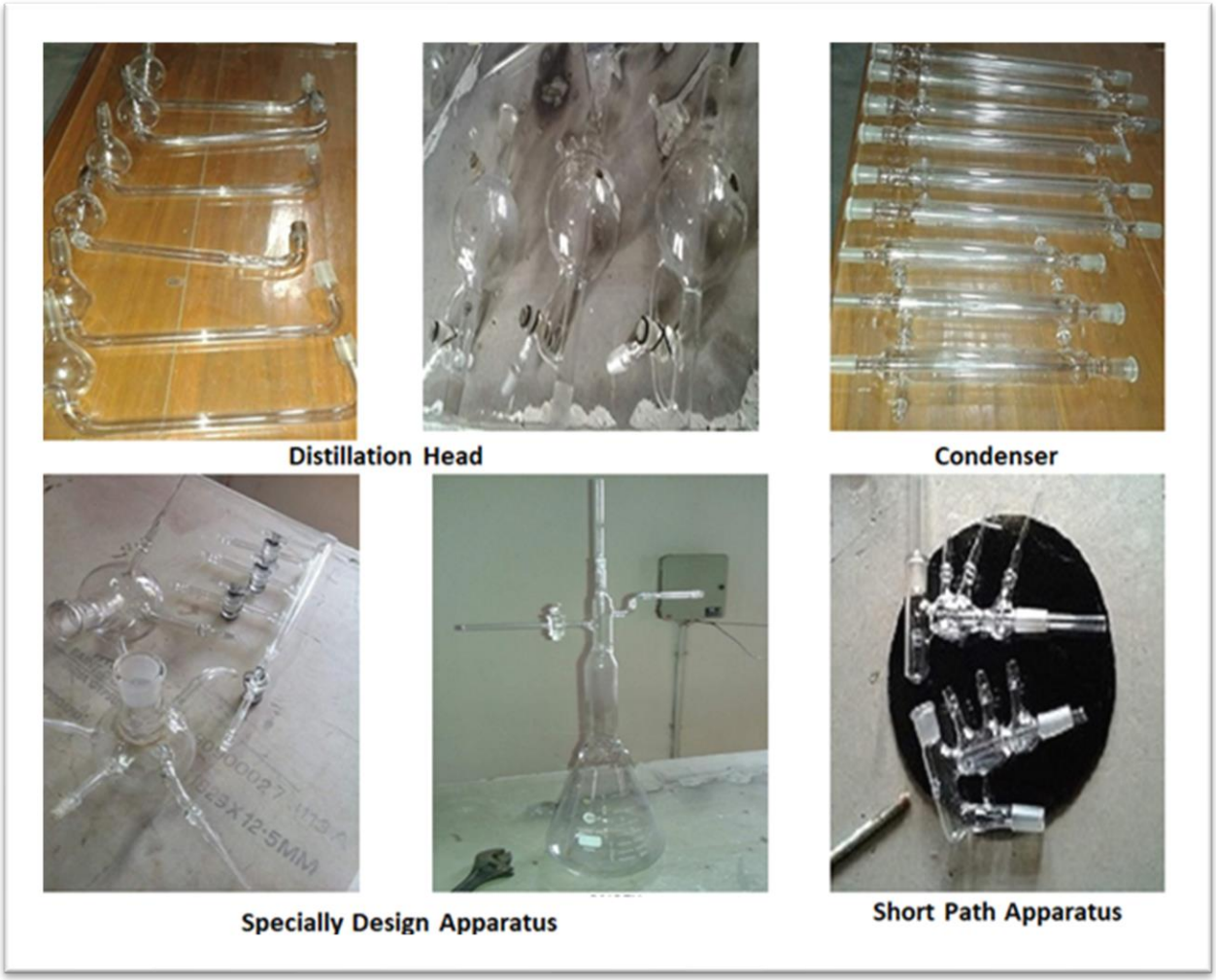
To note, SAIC, Tezpur University has been providing services to various institutes/ universities across the country.



Some of the facilities at SAIC, Tezpur University

SAIC, Tezpur University also has a Glass Blowing Workshop that cater the needs of Tezpur University and other outside institutions. Some of the activities of the glass

blowing section are shown below:



Some of the apparatus fabricated at Glass blowing Section, Tezpur University

HIGHLIGHTS OF THE PROGRAMME

- The seven days STUTI training program enabled the participants to have a close look, acquire skill-based knowledge and hands-on training into the sophisticated analytical instruments, viz., TEM, SEM, XRD-both single crystal and powder, UV-Vis-DRS Spectrometer, FTIR spectrometer, HPLC, BET, GC-MS, LC-MS, Fluorescence spectrometer, etc.
- Elaborate descriptions on the working principle of the sophisticated instruments, sample preparation and some of the applications.
- The participants received expertise on sophisticated instruments to gain deeper understanding of laboratory techniques, develop data analysis and interpretation skills.
- Participants received the opportunities to learn different softwares required for data processing, analyses and representation of results.
- Participants received opportunities to interact with the resource persons and technical persons one to one basis.
- Participants were encouraged to bring their own samples for analyses and in fact, their samples were analysed too.
- Participants were also briefed and demonstrated about the laboratory safety, instrument safety and precautions to be taken during running of the sophisticated instruments.

TOPICS COVERED

The main theme of this training program was to make aware the participants regarding the sophisticated instruments TEM, SEM, Single Crystal and powder XRD, UV Visible spectrophotometer, FTIR spectrophotometer, AAS, BET, HPLC, GC-MS, LC-MS and Fluorescence spectrometer housed in SAIC and other departments of Tezpur University. The training program includes theory lectures followed by demonstration/Hands on Training sessions on the sophisticated instruments.

One Week

Hands on Training program on Sophisticated Analytical Instruments

Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI)

October 31 – November 7, 2022

Sponsored by: Department of Science & Technology

Organized by

Department of Chemical Sciences, and Sophisticated Analytical Instrumentation Centre (SAIC), Tezpur University, Napaam in association with Sophisticated Analytical Instrumentation Facility (SAIF), Panjab University, Chandigarh

Inauguration Program ** [Day 1 Monday, October 31, 2022]	
Time (IST)	**Event**
09:00AM – 09:30AM	REGISTRATION [*Council Hall*]
10:00AM – 10:03AM	INVITING THE GUESTS TO THE DAIS (Vice Chancellor, Dean R&D, Dean SoS, Programme Conveners)
10:03 AM-10:05 AM	LIGHTENING OF LAMP
10:05 AM- 10.07 AM	TEZPUR UNIVERSITY ANTHEM
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10:50 AM-10:55 AM	VOTE OF THANKS DR. RAJIB BISWAS
10:55 AM-10:57 AM	NATIONAL ANTHEM
11:00 AM	HIGH TEA

STUTI HANDS-ON TRAINING PROGRAMME SCHEDULE, OCTOBER 31-NOVEMBER 7, 2022 TEZPUR UNIVERSITY

TLC: Teaching Learning Centre, SAIC: Sophisticate Analytical Instrumentation Centre

Day& Date ↓ Session, Venue & Time →	Session -1 (TLC) 9:30-10:00 am	11:00-11.30 am	Session -2 (TLC) 11:30-1:00 pm	1:00 - 2:00 pm	Session-3 (Hands on Training, SAIC) 2:00-3:30 pm	3:30-4:00 pm	Session-4 (Hands on Training, SAIC) 4:00-5:30 pm onwards
Day 1 **October 31, 2022 (Monday)**	Registration and Inauguration program** **(Council Hall)**	HIGH TEA	**Lecture : 1** **Dr. Amit B. Das** Dept. of Food Engineering & Technology, Tezpur University *Title: HPLC*	LUNCH BREAK	**Lecture : 2** **Dr. Kusum Bania** Dept. of Chemical Sciences, Tezpur University **(TLC)** *Title: Atomic Absorption Spectroscopy*	TEA BREAK	Training and Interaction session
Day 2 **November 01, 2022 (Tuesday)**	**Lecture : 3** **Dr. Bipul Sarma** Dept. of Chemical Sciences, Tezpur University *Title: Single Crystal X-ray Crystallography*	TEA BREAK	**Lecture : 4** **Dr. Sajal K. Das** Dept. of Chemical Sciences, Tezpur University *Title: LCMS*		Training and Interaction session		Training and Interaction session
Day 3 **November 02, 2022 (Wednesday)**	**Lecture : 5** **Prof. Dambarudhar Mohanta** Dept. of Physics Tezpur University *Title: Time Resolved Photoluminescence*		**Lecture : 6** **Dr. Pankaj Bharali** Dept. of Chemical Sciences, Tezpur University *Title: BET*		Training and Interaction session		Training and Interaction session
Day 4 **November 03, 2022 (Thursday)**	**Lecture : 7** **Dr. Sandeep Kumar** Dept. of Bio & Nano Technology, Guru Jambheshwar University of Science & Technology, *Title: An overview of high-resolution imaging techniques with emphasis on electron microscopy*		**Lecture : 8** **Prof. Neeraj Dilbaghi** Dept. of Bio & Nano Technology, Guru Jambheshwar University of Science & Technology, *Title: Nanomaterials for environmental healthcare application*		Training and Interaction session		Training and Interaction session

Day 5 November 04, 2022 (Friday)	**Lecture : 9** **Dr. Pranjal K. Gogoi** Dept. of Applied Sciences, Tezpur University *Title: Transmission Electron Microscopy*		**Lecture : 10** **Dr. Hemen K. Kalita** Dept. of Physics Gauhati University *Title: Scanning Electron Microscopy*		Training and Interaction session		Training and Interaction session	
Day 6 November 05, 2022 (Saturday)	**Lecture : 11** **Dr. Bimal Sarma** Dept. of Physics Gauhati University *Title: Powder X-Ray Crystallography*		**Lecture : 12** **Dr. Biswajit Choudhury** Institute of Advanced Studies in Science & Technology, Guwahati *Title: UV-VIS spectrometry and FTIR spectroscopy*		Training and Interaction session		Training and Interaction session	
Day 7 November 06, 2022 (Sunday)	**Day long local tour program**							
Day 8 November 07, 2022 (Monday)	**Lecture : 13** **Prof. Ganga R. Choudhury** *Title: Nanomaterial synthesis characterization and their environmental applications*	**TEA BREAK**	**Lecture : 14** **Prof. Poonam Mishra** Dept. of Food Engineering & Technology, Tezpur University *Title: GCMS*	**LUNCH**	Training and Interaction session	**TEA BREAK**	Training and Interaction session	**Valedictory Session**

PARTICIPATING INSTITUTES STATE WISE

Sl. No.	State/Country	Institutes	No. of Registered Participants
1.	Assam	Assam University, Silchar	02
		Defence Research Laboratory, DRDO, Tezpur	03
		National Institute of Technology, Silchar	02
		Nowgong College, Nagaon*	04
		Pandu College, Guwahati	01
		Cotton University, Guwahati	01
		Kokrajhar Govt. College, Kokrajhar	01
		Tezpur University**	15
2.	Arunachal Pradesh	Rajiv Gandhi University, Doimukh	03
		Academy of Scientific and Innovative Research (AcSIR)	01
3.	Haryana	Guru Jambheshwar University of Science and Technology, Hisar	02
4.	Orisha	CIPET:SARP-LARPM, Bhubaneswar	01
5.	Tamilnadu	St. Joseph's College (Autonomous), Tiruchirappalli	01
		The American College, Madurai	01
TOTAL			**38**

Since many of the outside participants did not turn up despite confirmation from their part, chances were given to

*** Applicants from nearby institute and**

**** Internal applicants**

LOGO OF PARTICIPATING INSTITUTES

Sl. No.	State / Country	Institutes	Logo
1.	Assam	Assam University, Silchar	
		Defence Research Laboratory, DRDO, Tezpur	
		National Institute of Technology, Silchar	
		Nowgong College, Nagaon	
		Pandu College, Guwahati	
		Cotton University, Guwahati	
		Kokrajhar Govt. College, Kokrajhar	

		Tezpur University, Napaam	
2.	Arunachal Pradesh	Rajiv Gandhi University, Doimukh	
		NEIST, Arunachal, Academy of Scientific and Innovative Research (AcSIR)	
3.	Haryana	Guru Jambheshwar University of Science and Technology, Hisar	
4.	Orisha	CIPET:SARP-LARPM, Bhubaneswar	
5.	Tamilnadu	St. Joseph's College (Autonomous), Tiruchirappalli	
		The American College, Madurai	

List of Registered Participants

SI No.	Name	Affiliation	State	Designation
01	Tage Seema	Rajiv Gandhi University	Arunachal Pradesh	Ph.D. scholar
02	Kasturi Pusty	Assam University	Assam	Ph.D. scholar
03	Jimasree Rava	Defence Research Laboratory (DRL), Tezpur	Assam	Ph.D. scholar
04	Musfica Sultana	NIT, Silchar	Assam	Ph.D. scholar
05	Madhabi Konwar	Nowgong College, Nagaon	Assam	Ph.D. scholar
06	Shyamalee Patar	Nowgong College, Nagaon	Assam	Ph.D. scholar
07	Irabati Brahma	Pandu College	Assam	Ph.D. scholar
08	Sweta Das	Cotton University, Guwahati	Assam	Ph.D. scholar
09	Nirankush Borah	Academy of Scientific and Innovative Research (AcSIR)	Arunachal Pradesh	Ph.D. scholar
10	Mriganka Shekhar Borah	Assam University	Silchar	Ph.D. scholar
11	Utpal Dutta	Rajiv Gandhi University	Arunachal Pradesh	Ph.D. scholar
12	Rishi	Guru Jambheshwar University of Science and Technology, Hisar	Haryana	Ph.D. scholar
13	Gaurav Tiwari	Defence Research Laboratory (DRL), Tezpur	Assam	Ph.D. scholar
14	Pramanand Kumar	National Institute of Technology, Silchar	Assam	Ph.D. scholar
15	Prasanna Sekar	CIPET:SARP-LARPM, Bhubaneswar	Orisha	Ph.D. scholar
16	Dr. A. Arun Viveke	St. Joseph's College (Autonomous), Tiruchirappalli	Tamilnadu	Faculty Member
17	Dr. R. Kennedy	The American College, Madurai	Tamilnadu	Faculty Member
18	Deepjyoti Mazumder	Kokrajhar Govt. College	Assam	Ph.D. scholar
19	Anuj Sharma	Guru Jambheshwar University of Science & Technology, Hisar	Haryana	Ph.D. scholar
20	Prakash Bhuyan	Rajiv Gandhi University	Arunachal Pradesh	Ph.D. scholar

21	Priyanga Manjuri Bhuyan	Nowgong College, Nagaon	Assam	Ph.D. scholar
22	Nayana Sut	Nowgong College, Nagaon	Assam	Ph.D. scholar
23	Mrityunjoy Das	Defence Research Laboratory (DRL), Tezpur	Assam	Ph.D. scholar
24*	Santanu Goswami	Tezpur University	Assam	Ph.D. scholar
25*	Asadulla Asraf Ali	Tezpur University	Assam	Ph.D. scholar
26*	Anamika Nath	Tezpur University	Assam	Ph.D. scholar
27*	Monalisha Chutia	Tezpur University	Assam	Ph.D. scholar
28*	Biprav Chetry	Tezpur University	Assam	Ph.D. scholar
29*	Cinmoyee Baruah	Tezpur University	Assam	Ph.D. scholar
30*	Rashmi Chetry	Tezpur University	Assam	Ph.D. scholar
31*	Payal Dhar	Tezpur University	Assam	Ph.D. scholar
32*	Ripunjoy Borah	Tezpur University	Assam	Ph.D. scholar
33*	Tonmoy Jyoti Borah	Tezpur University	Assam	Ph.D. scholar
34*	Salma Akhtara Khanam	Tezpur University	Assam	Ph.D. scholar
35*	Nupur Borah	Tezpur University	Assam	Ph.D. scholar
36*	Rupam Bharat Saikia	Tezpur University	Assam	Ph.D. scholar
38*	Nayan Jyoti Mahapurushia	Tezpur University	Assam	Ph.D. scholar

*** Since many of the outside participants did not turn up despite confirmation from their part, chances were given to internal applicants.**

ORGANISER'S REPORT

Department of Chemical Sciences and Sophisticated Analytical Instrumentation Centre (SAIC), Tezpur University in association with Sophisticated Analytical Instrumentation Facility (SAIF), Panjab University, Chandigarh has successfully organized One Week Hands on Training program on Sophisticated Analytical Instruments under Synergistic Technological Training Program Utilizing the Scientific and Infrastructure (STUTI). The training program, which was sponsored by Department of Science & Technology, GoI was coordinated by Prof. Ashim J. Thakur, and Prof. Pabitra Nath. Resource Persons for the training program were exceptionally experienced faculty members from reputed Indian Institutes and Tezpur University. The content of the invited talks reflects the wide variety of sophisticated instruments such as TEM, SEM, Single crystal and powder XRD, UV-Vis spectrophotometer, FT IR spectrophotometer, AAS, BET, HPLC, GC-MS, LC-MS and Time resolved Fluorescence spectrometer.

Around 30 participants from India took part in the programme. The scientific sessions were highly useful for the budding researchers who participated in the training program. The training program was meant for a range of academics like faculties, scientists, Post-Doc Fellows, Ph.D. scholars and industrialists who are actively involved in R&D and seek knowledge of various characterization techniques. The course also rendered the participants to have latest knowledge in the state-of-the art in the respective arena.

WELCOME AND OPENING ADDRESSES

Prof. Ashim J. Thakur, Convener of STUTI Training Program, welcomed Hon'ble Vice-Chancellor, Tezpur University, Prof. Dhruba K. Bhattacharyya, Deans of different schools, Dean R&D, Heads of different departments, faculty members of Tezpur University and participants. "It was really a tough job to select 30 participants out of more than 140 applicants. That reflects the necessity of such programme" – Prof. Thakur mentioned. He congratulated the selected participants for being selected for the STUTI programme. He briefed about the programme schedule, different topics to be covered during the programme, hand on training

and urged the participants to extract maximum from the programme. As per norms of the programme, the program consists of both theory and as well as hands-on training with various instruments conceptualized and supported by DST. The uniqueness of the program includes a minimum of four hours of theory and remaining 50% of the duration is on practical training on the equipment, he said.

Hon'ble Vice-Chancellor, Tezpur University, Prof. Dhruba K. Bhattacharyya highlighted the key points of the STUTI training program, its schedule and emphasized on the importance of the training program. Current scenario of instrumentation facility in the country and their optimal uses were touched upon by Hon'ble Vice-Chancellor in his address. In this context he also elaborated on different schemes made available by GoI. He encouraged the participants for such programmes. In his key speech, Prof. Bhattacharyya mentioned that his program was unique, and it would enable the participants to acquire knowledge about the various state-of-the-art equipment. He also congratulated the organizing committee for organizing this program. He wished that participants of this training programme would act as ambassadors and would disseminate the acquired knowledge to the younger budding generation so that they will take up science and technology as career.

Hon'ble Vice-Chancellor, Tezpur University, Prof. Dhruba K. Bhattacharyya addressing the audience.

A section of the audience listening to Hon'ble Vice-Chancellor, Tezpur University, Prof. Dhruba K. Bhattacharyya's address.

Prof. Dhanapati Deka, Dean R&D, Tezpur University in his address emphasized the importance of hands-on training programmes. In this sense, STUTI is a unique programme. Getting opportunity for such training is itself a prestigious one. "Tezpur University has state of the art facilities for research and has been acting as a vibrant platform for such activities and would continue to do so in future"- he added. He thanked policy makers and DST for bringing such programmes for the one who are deprived of

Prof. Dhanapati Deka, Dean R&D addressing the audience

such facilities. Further, he remarked that the participants would not get only exposure to high-end techniques but would also know the capabilities of different tools that they can use in their research activities.

Prof. Ashim J. Thakur, Convener, STUTI Training programme putting opening remarks

Hon'ble Vice-Chancellor, Tezpur University, Prof. Dhruba K. Bhattacharyya unveils the training booklet

A formal vote of thanks was presented by Dr. Rajib Biswas. He expressed our gratitude to DST- New Delhi and Panjab University- Chandigarh, resource persons, organizing committee members and participants for making the inaugural event a grand success.

Vote of thanks by Dr. Rajib Biswas

The inaugural programme was anchored by Ms. Anamika Nath, research Scholar, Dept. of Molecular Biology and Biotechnology, Tezpur University.

DAY BY DAY PROCEEDINGS

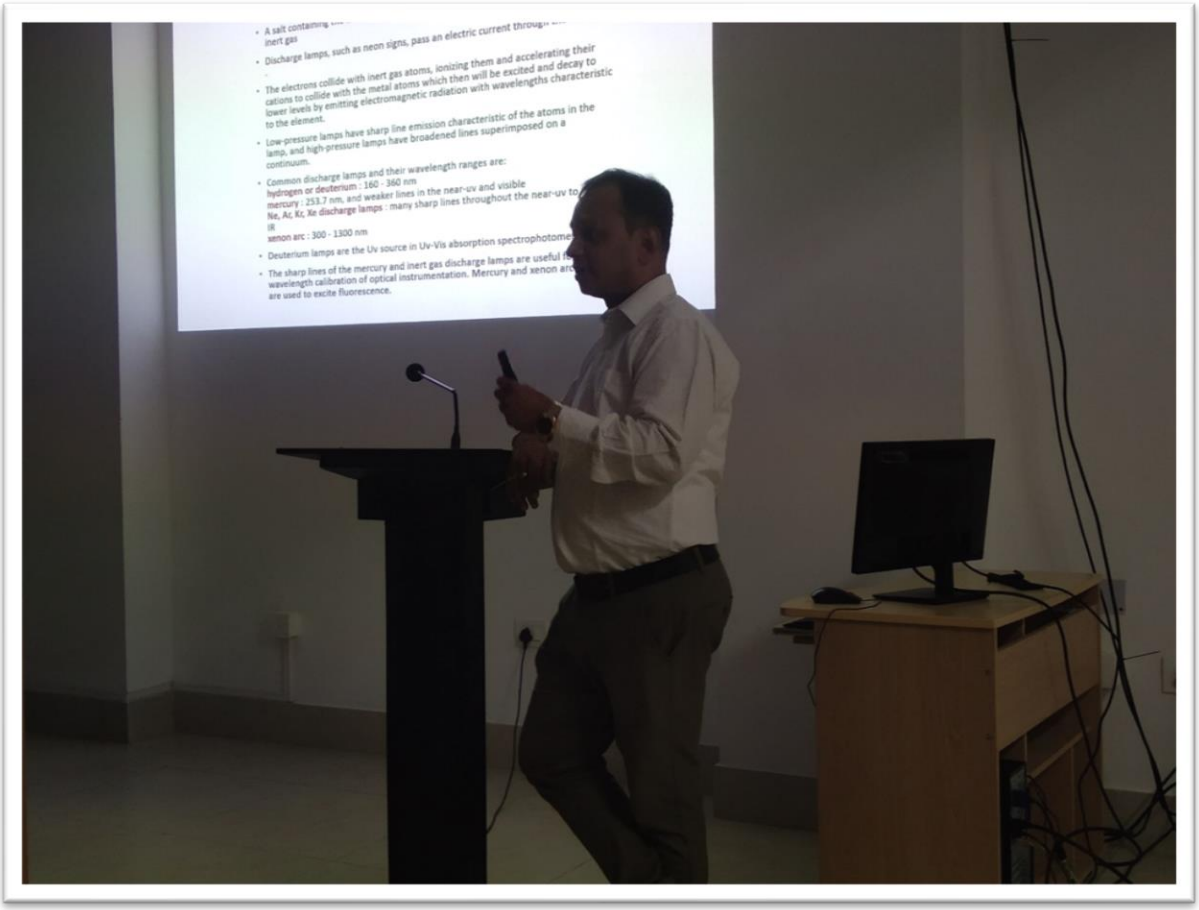
DAY 1

The First session of the training program started with the lecture by Dr. Amit B. Das from Dept. of Food Engineering & Technology, Tezpur University. This talk elaborately discussed High Performance Liquid Chromatography (HPLC) as an analytical tool. HPLC technique offers a rapid, automated and highly precise method to recognize certain chemical components in a sample or complex mixture. After

Dr. Amit B. Das delivering lecture on HPLC

explaining the basic principles and instrumentation of HPLC, Dr. Das put emphasize on other important aspects, i.e. parameters which are very crucial for analysis. He showed some practical examples to explain these aspects.

The second session of the training programme started with the talk by Dr. Kusum Bania, Dept. of Chemical Sciences, Tezpur University. His lecture covered Atomic Absorption Spectroscopy (AAS). Atomic absorption spectroscopy is the most widely used technique for the determination of metals at trace and ultra-trace levels in a sample. In environmental testing, it can measure the concentration of various elements in rivers, drinking water and seawater. It is used to analyze metals in biological fluids such as blood, hair, and urine. It is used in pharmaceutical industries for quantitative analysis of metals in samples for example, in multivitamins tablets. Its basic principle, sample preparation and analyses were discussed in detail. Most importantly, the limitations and drawback of the technique was also highlighted. Both the sessions witnessed fruitful



Dr. Kusum Bania delivering lecture on AAS

discussions on the questions/issues put forwarded by the participants after the lecture.

The uniqueness of this STUTI programme, i.e. the hands-on training component, is one of the major attractive events for the participants to receive wider exposure to the various synthesis and characterization techniques. During the training, participants had an opportunity to visit the Sophisticated Analytical Instrumentation Centre (SAIC) at Tezpur University. Head, SAIC, TU, Prof. Pabitra Nath welcomed the participants. The participants were given a brief demonstration of all the instruments available at SAIC, TU. All the participants were divided into two groups for receiving effective hands-on training on HPLC and AAS. Dr. Das and Dr. Bania were assisted by technical persons, Mr. Prakash Kurmi (for HPLC) and Mr. Manoranjan Sarma (for AAS) from SAIC during training session. Resource persons were thrilled by the questions of the participants.

Mr. Prakash Kurmi, Technical Assistant, SAIC, TU interacting with the participants during HPLC hands-on training session

Dr. Kusum Bania interacting with the participants during AAS hands-on training session

Dr. Kusum Bania interacting with the participants during hands-on training session

Going by experiences and feedback received from the participants, it is very much clear that such exposure to several characterizations is very much helpful for them to improve their knowledge and pursue their research with higher quality. The first day of the training program was a great success and the organizers look forward to six more days to make this training programme a better platform for budding researchers to know about various sophisticated analytical techniques.

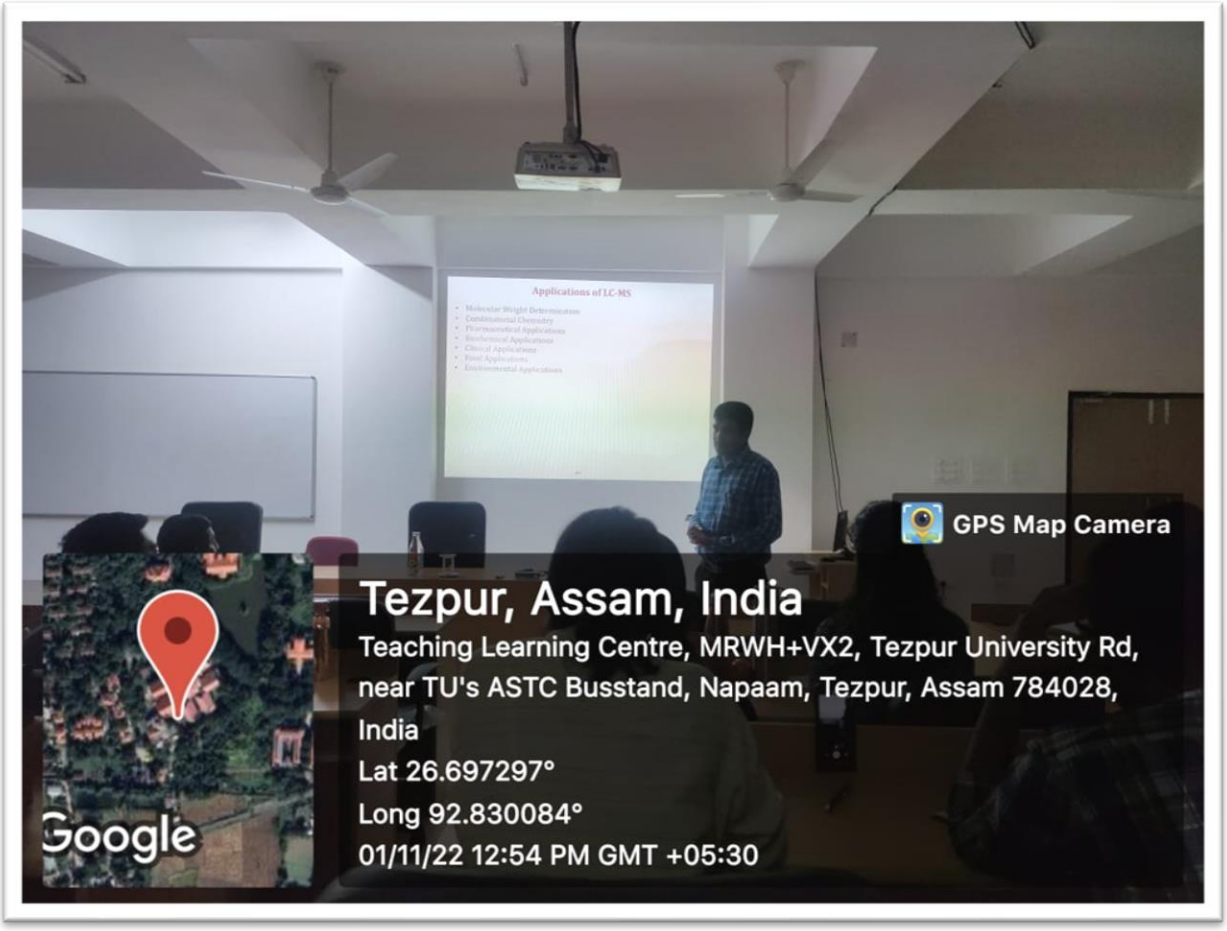
DAY 2

A talk on Single Crystal X-ray Crystallography by Dr. Bipul Sarma, Dept. of Chemical Sciences, Tezpur University initiated the second day proceedings. Single-crystal X-ray crystallography is the only unambiguous method for total molecular characterization. He discussed in detail the topic. It was a very important and informative talk on the chosen topic. The talk also gave information about the recent advances in the area. Dr. Sarma also showed

Dr. Bipul Sarma delivering lecture on SXRD

some real examples where single crystal X-ray crystallography played a decisive role. X-ray crystal structures can also account for unusual electronic or elastic properties of a material, shed light on chemical interactions and processes, or serve as the basis for designing pharmaceuticals against diseases. In a single-crystal X-ray diffraction measurement, a crystal is mounted on a goniometer.

Next talk of the training program on second day was delivered by Dr. Sajal K. Das from Dept. of Chemical Sciences, Tezpur University on Liquid Chromatography - Mass Spectrometry (LCMS). The LC-MS is a powerful tool for the detection of residual chemical compounds, confirmatory identification of small organic molecules, and confirmation and quantitation of contaminants and adulterants in pharmaceutical and food samples. Different ionization techniques were also discussed. How Mass spectrometry acts as the detector here. Was specifically mentioned.



Dr. Sajal Das delivering lecture on LCMS

Last session ended with the demo on single crystal X-ray Diffraction and LCMS. Demonstration session were appreciated by all the participants. Participants were more inclined to LC-MS.

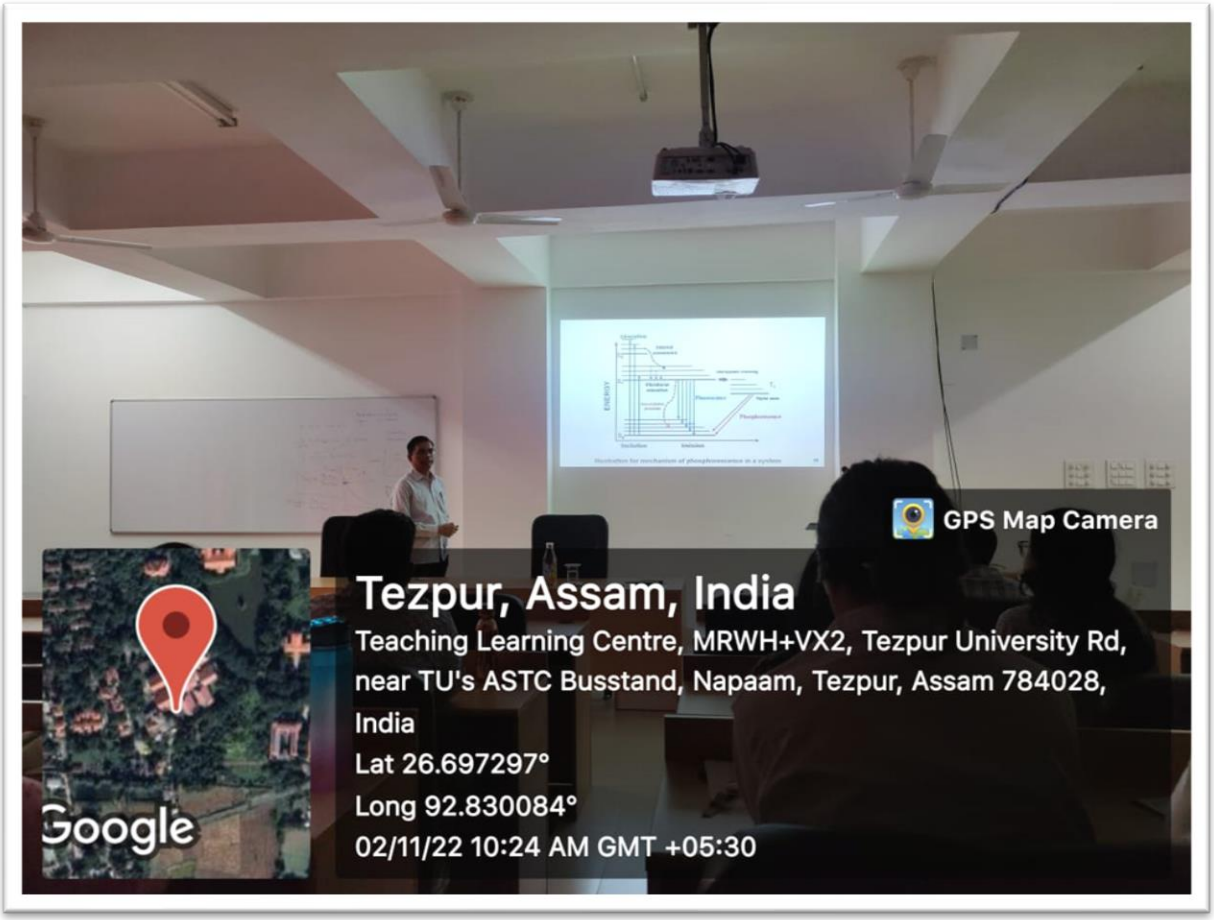
Dr. Nipu Dutta, Technical assistant, Dept. of Chemical Sciences, TU interacting with the participants during LCMS hands-on training session

DAY 3

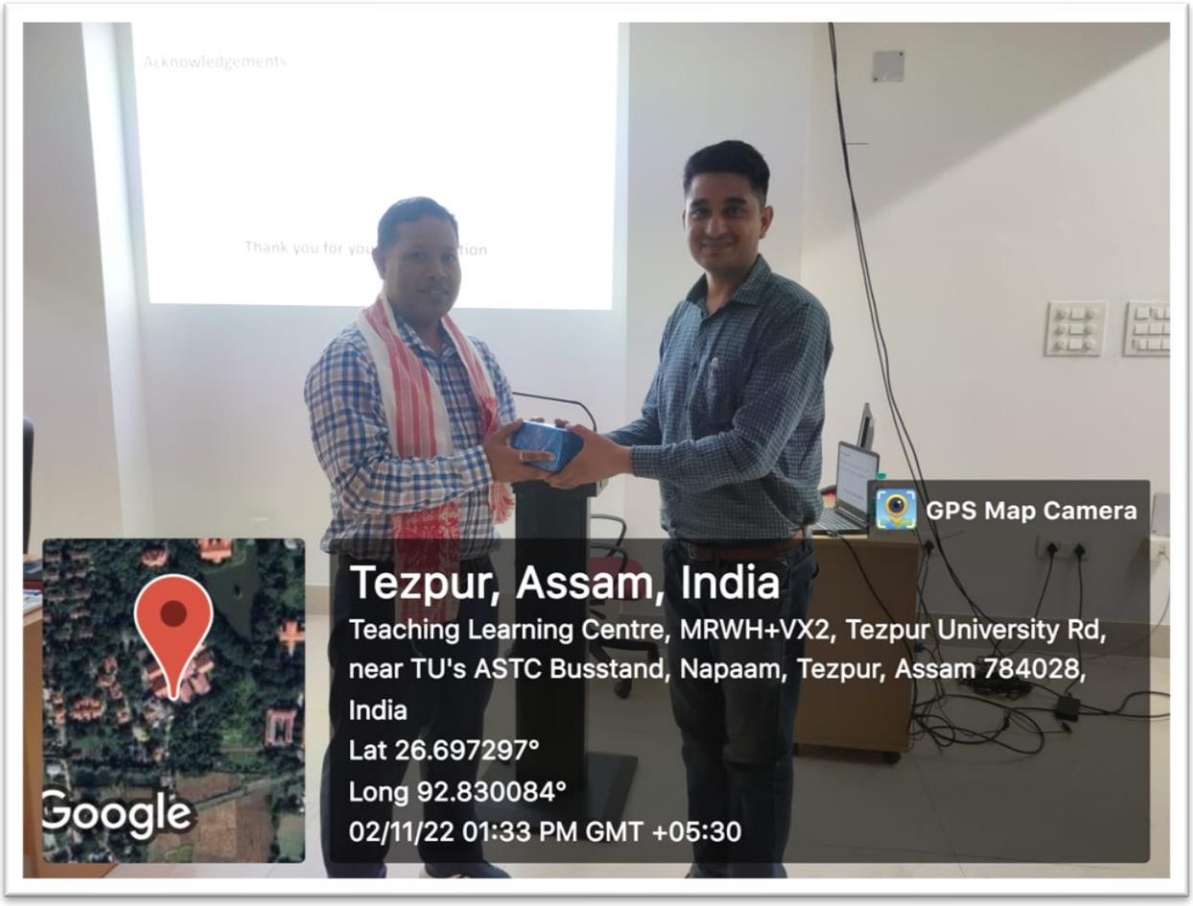
The third day started with a talk of Prof. Dambarudhar Mohanta from Dept. of Physics Tezpur University. He talked about Time Resolved Photoluminescence (TRPL). It is a powerful method to characterise the behaviors of carriers as it has high time resolution that could reflect the reactions of carriers within nanoseconds. For solar cells, minority carrier lifetime is the most important parameter. TRPL has been used to measure the lifetime for uniform materials. Detail description of this uncommon technique was discussed, and the participants realized its usefulness and capability. Prof. Mohanta encouraged all the participants to come up with some projects for future collaboration. Participants were more curious to look and learn this uncommon instrument during practical session.

The second lecture of the second day was delivered by Dr. Pankaj Bharali from Dept. of Chemical Sciences, Tezpur University. The lecture was delivered on physisorption techniques along with its variance to chemisorption techniques.

Especially, the lecture introduced the basic surface chemistry, encompassing adsorption vs. adsorption on solid surface. Surface area, pore size and pore volume of solid materials are characteristic textural properties which are important in diverse areas of catalysis, adsorbent, gas sensors, pharmaceuticals, ceramics and so on. Surface area of solid materials may be calculated by physisorption of gases on to its surface by Langmuir and BET methods. The BET method considers multilayer adsorption of gases to its surface and one of the most accepted methodologies to calculate specific surface area. BJH and other methods are utilized to calculate pore size and pore volume. Demonstration of the BET surface area measurement of samples was performed with existing Quantachrome Autosorb iQ analyzer (SAIC, Tezpur University). Students interacted very well during the lecture as well as hands on training of sample.



Prof. Dambarudhar Mohanta delivering lecture on TRPL



Dr. Pankaj Bharali being felicitated by Mr. Bunty Sarma, RA, STUTI PMU

Mr. Palash Dutta, Technical assistant, Dept. of Physics, TU interacting with the participants during TRPL-on training session

Dr. Pankaj Bharali interacting with the participants during BET hands-on training session

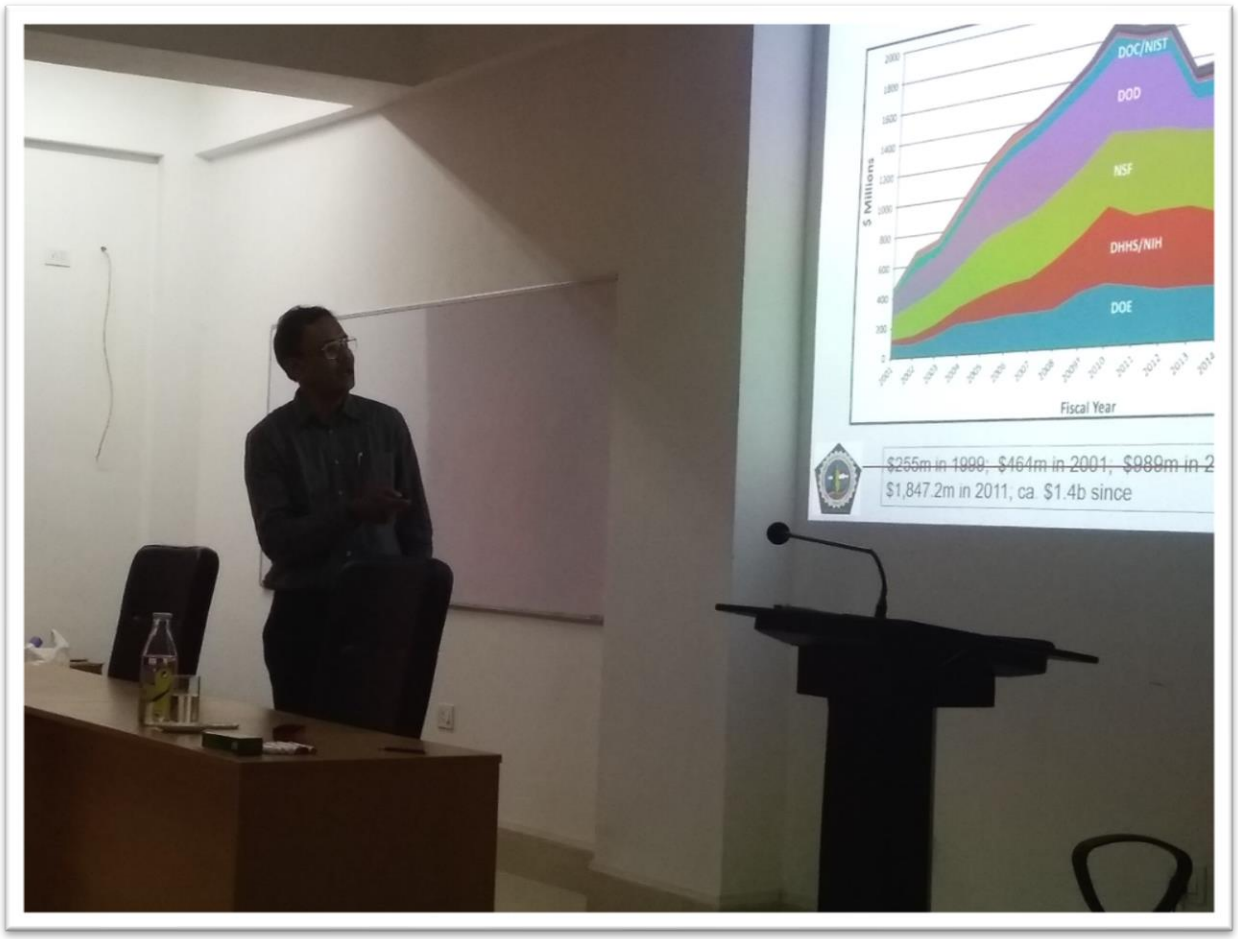
DAY 4

The day began with an invited talk by Dr. Sandeep Kumar from Dept. of Bio & Nano Technology, Guru Jambheshwar University of Science & Technology, on the topic, "An overview of high-resolution imaging techniques with emphasis on electron microscopy". Electron microscopes are important for the depth of detail they show, which has led to a variety of important discoveries. Understanding their importance requires an understanding of how they work, and how this has led to further discovery. The reasons these microscopes are so important is the sheer level of detail that can be seen with them. Dr. Kumar clearly explained the difference between electron microscope and light microscope. Electron microscopes provide an image resolution in the range of up to 0.2 nm. An electron microscope can achieve magnification in excess of 100,000x compared with 1000X magnification with light microscopy. Further, difference between Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM) was also explained very lucidly.

Dr. Sandeep Kumar delivering lecture on Microscopy

The second lecture was given by Prof. Neeraj Dilbaghi from Dept. of Bio & Nano Technology, Guru Jambheshwar University of Science & Technology. He has chosen an interesting topic, "Nanomaterials for environmental healthcare application". It was a very interesting lecture and participants enjoyed most. Nanotechnology and nanomaterials in healthcare applications can offer various benefits, e.g. miniaturisation techniques and approaches have converged with chemical synthesis and control of molecular assembly to produce exciting opportunities for the prevention, diagnosis and treatment of disease. Nanotechnology can be used to design pharmaceuticals that can target specific organs or cells in the body such as cancer cells and enhance the effectiveness of therapy. In this context, he showed many examples of products based on nanotechnology which are already in the market.

Further, he added, "The design and synthesis of novel nanomaterials allows for enhanced performance for environmental-related applications and nanotechnology is a promising area of research".



Prof. Neeraj Dilbaghi delivering lecture on Nanomaterials

DAY 5

The first lecture of day 5 was delivered by Dr. Pranjal K. Gogoi from Dept. of Applied Sciences, Tezpur University on Transmission Electron Microscopy (TEM) - a highly sensitive versatile tool to characterize materials. It provides information on morphology, structure, chemistry and even the nature of bonds. He pointed out that Science and technology ever seek to build structures of progressively smaller sizes. This effort at miniaturization has finally reached the point where structures and materials can be built through "atom-by-atom" engineering. Microscopes are important to understand both inanimate matter and living objects at their elementary level. Dr. Gogoi also mentioned another dimension of microscopy, Energy Dispersive X-ray analysis (EDX) along with TEM and SEM. He put extreme emphasis on characterization and manipulation of individual nanostructures that require not only extreme sensitivity and accuracy but also atomic level resolution.

Dr. Pranja K. Gogoi being felicitated by Prof. Dambarudhar Mohanta, Dept. Of Physics, Tezpur University

The second session of the day was delivered by a young faculty, Dr. Hemen K. Kalita from Dept. of Physics, Gauhati University on Scanning Electron Microscopy (SEM). In fact, advent of high resolution microscopic techniques revolutionized the research regime. Similar to TEM, another powerful technique, Scanning electron microscopy produces magnified and detailed images of elements by scanning their surface to create high-resolution images. The resulting image shows physical features and information about objects. A scanning electron microscope obtains information about the topography and composition of elements. Dr. Kalita explained some examples through which different information could be extracted using SEM. Moreover, the key differences between SEM and TEM were well explained. He also shared some of experiences, he had during his PhD at IIT-Bombay. During the hand-on training session, participants were highly enthusiastic about SEM as evidenced by effective interaction with Dr. Kalita.

Dr. Hemen K. Kalita delivering lecture on TEM

Mr. Prakash Kurmi, Technical Assistant, SAIC, TU interacting with the participants during TEM hands-on training session

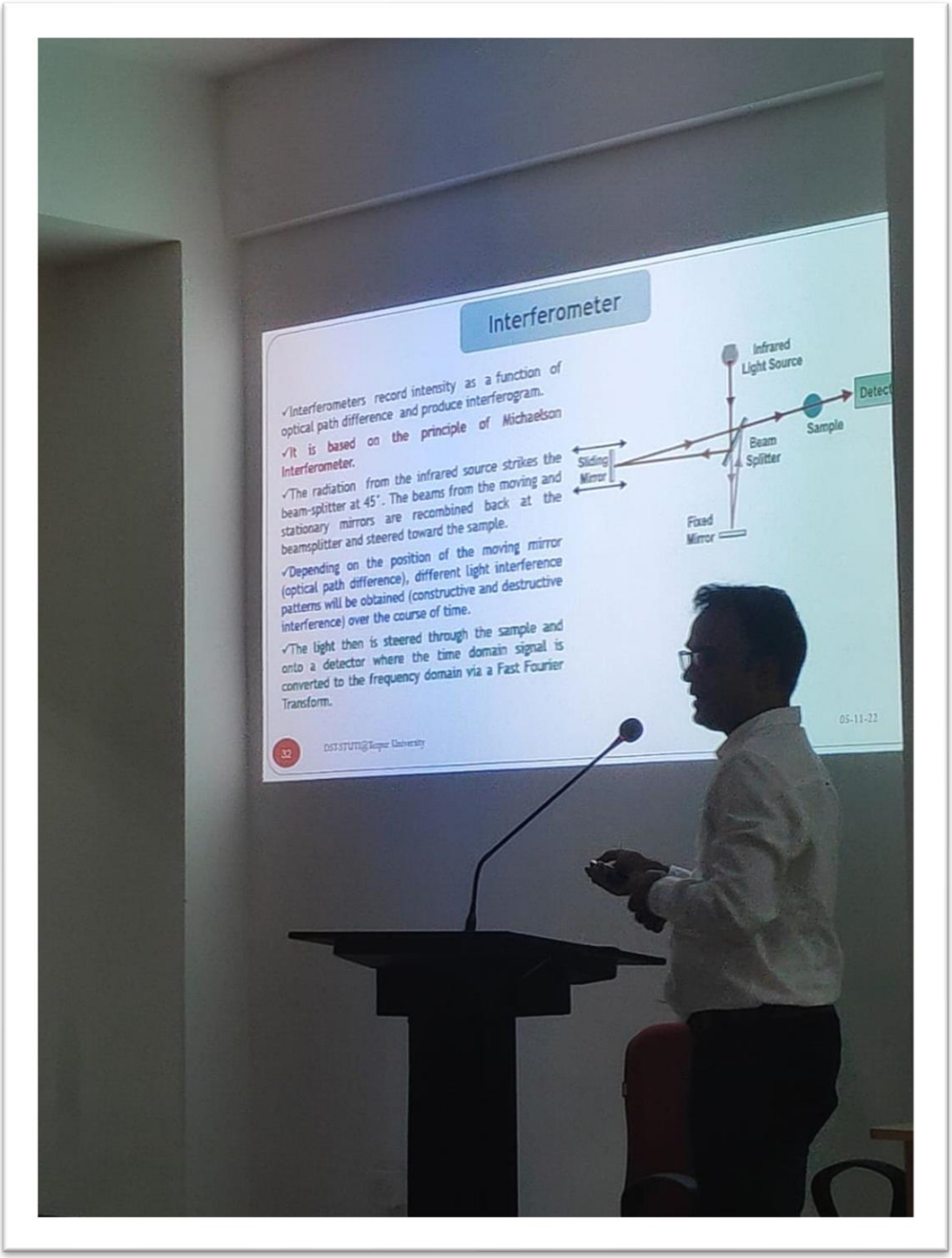
DAY 6

The sixth day started with an invited lecture by Dr. Bimal Sarma from Dept. of Physics, Gauhati University. He delivered a talk on Powder X-Ray Crystallography. He started his talk with the question, "What can we learn from X-ray diffraction"? He gave an elaborative talk on Structure property relationship in molecular solids by using XRD and the identification of crystalline compounds by their diffraction pattern. He discussed in detail the importance of X-ray Diffraction and also provided information about the internal lattice of crystalline substances, including unit cell dimensions, bond-lengths, bond-angles, and details of site-ordering. He also explained the difference between the single crystal XRD and powder XRD.

Dr. Bimal Sarma delivering lecture on PXRD

Next lecture was delivered by Dr. Biswajit Choudhury from Institute of Advanced Studies in Science & Technology (IASST), Guwahati on UV-VIS and FTIR spectroscopy, the two old yet powerful techniques for both qualitative and quantitative purpose. These two techniques are routinely used by researchers and have tremendous

applications in different areas. His lecture focused mainly on identification and structure analysis of a variety of substances, including both organic and inorganic compounds by these techniques. Couple of examples were explained.



Dr. Biswajit Choudhury delivering lecture on UV-VIS and FTIR spectroscopy

Dr. Biswajit Choudhury being felicitated by Prof. Pabitra Nath, Convener, STUTI programme

Dr. Bimal Sarma with the participants during hands-on training on PXRD

DAY 7

The first talk of the last day of training program was delivered by Prof. Ganga R. Choudhury, STUTI Coordinator-PMU from Department of Chemistry, Panjab University, Chandigarh on Nanomaterial synthesis, characterization and their environmental applications. Nanotechnology is a promising science with wide applications from cosmetics, food products, clothing, and household appliances to fuel catalyst, disease treatment, and renewable energies. Nanotechnology is also being applied to a variety of industrial and purification processes including construction materials, nanomachining of nanowires, nanorods, graphene, water filtration, and wastewater treatment.

Prof. Ganga R. Choudhury delivering lecture on nanomaterials

At the very beginning of his lecture, Prof. Choudhury briefed about STUTI programme.

"The applications of nanomaterials in environmental improvement are different from one another depending on the type of devices used, for example, solar cells for producing clean energy, nanotechnologies in coatings for building exterior surfaces, and sonochemical decolorization of dyes by the effect of nanocomposite" he mentioned. He emphasized, "The design and synthesis of novel nanomaterials allows for enhanced performance for environmental-related applications". Some examples of his own research were also suitably discussed.

The second talk of the Day and the last talk of the whole training programme was delivered by Prof. Poonam Mishra from Dept. of Food Engineering & Technology, Tezpur University on GC-MS. Gas chromatography–mass spectrometry (GC-MS) is a hyphenated analytical tool that combines the features of gas-chromatography and mass spectrometry to identify different substances within a test sample. From detection of potential toxic chemicals in foods to quantitation of organic contaminants in water or analysis of petroleum products during oil processing, GC-MS can be used for a variety of applications. After explaining the basic principles, Prof. Mishra tool up some general examples followed by some examples from her area, i.e. Food Engineering & Technology. Some very crucial parameters which are very important for analyses were also highlighted by Prof. Mishra.

VALDICTORY SESSION

Valedictory Program [Monday, November 07, 2022 @ 3:30 PM - 5:00 PM]	
Time (IST)	Event
03:30PM – 03:40PM	Complete report of the Program by Prof. Ashim J. Thakur
03:40PM – 03:50PM	Address by Dean, R&D, Tezpur University
03:50PM – 04:00PM	Address by Prof. Ganga R. Chaudhary
04:00PM – 04:15PM	Feedback by Participants
04:15PM – 04:30PM	Certificate Distribution to participants
04:30PM – 04:35PM	Vote of Thanks
04:35PM – 04:45PM	Photo session
04:45PM	High Tea

The weeklong training program on "Hands on Training program on Sophisticated Analytical Instruments" under STUTI came to an end on 7th November 2022 at Tezpur University. The workshop was organized jointly by the Department of Chemical Sciences and Sophisticated Analytical Instrumentation Centre (SAIC), Tezpur University in association with Sophisticated Analytical Instrumentation Facility (SAIF), Panjab University, Chandigarh. Prof. Ashim J. Thakur, Department of Chemical Sciences, Tezpur University and Prof. Pabitra Nath, Head, SAIC, Tezpur University were the conveners of the training programme.

The valedictory session of the programme was presided over by Prof. Dhanapati Deka, Dean (R&D), Tezpur University and Prof. Ganga R. Choudhury, STUTI Coordinator-PMU from Department of Chemistry, Panjab University, Chandigarh was the chief guest on the occasion.

Prof. Thakur presented a detailed report of the 7-days STUTI training program. He mentioned that total of 38 participants (including internal) from 14 different institutes, colleges, and universities have participated in this training program representing 5 States/UTs. "14 eminent speakers delivered the lectures during the 7-day training program. The participants were provided hands-on training on sophisticated instruments present in the SAIC (TEM, SEM, Single Crystal and powder XRD, UV Visible spectrophotometer, FTIR spectrophotometer, AAS, BET,

HPLC, GC-MS, LC-MS and Fluorescence spectrometer).

Prof. Ashim J. Thakur presenting the report

Prof. G. R. Chaudhary said the DST STUTI programme was designed and materialsed for the participants of various institutes across the country. He added, "The idea of STUTI is to impart hands-on training and access to science and technology infrastructure present in DST-supported institutes".

Prof. Ganga R. Choudhury addressing the participants

Prof. Dhanapati Deka, Dean (R&D), Tezpur University mentioned Tezpur University's interest in conducting such programmes and would organize such or similar programmes in upcoming years also for the benefit of students and young faculty. In this connection, he also urged for collaboration with other institutions so that each can gain from each other's experience.

Prof. Dhanapati Deka addressing the participants

A section of the audience

Certificates were presented to participants by Prof. G. R. Choudhury, Prof. Dhanapati Deka, Prof. Ashim J. Thakur, Dr. Raib Biswas, Dr. Dambarudhar Mohanta, Dr. Bipul Sarma and Dr. Pranjal K. Gogoi.

Prof. Ganga R. Choudhury presenting the certificate to the participants

Prof. Dhanapati Deka presenting the certificate to the participants

Dr. Rajib Biswas presenting the certificate to the participants

Participants also shared their experiences with the audience. They also prepared a short video of their experiences. That was screened during valedictory programme.

Participant sharing his experiences

Participant sharing her experiences

Dr. Bipul Sarma, Department of Chemical Sciences presented vote of thanks.

The valedictory session was anchored by Ms. Anamika Nath, Research Scholar, Department of Molecular Biology and Biotechnology, Tezpur University also one of the participants of the training programme.

Dr. Bipul Sarma presenting vote of thanks

Singing of national anthem

Ms. Anamika Nath anchoring the valedictory session

Group Photo

Small Group Photo

WAY FORWARD

Based on the responses, interactions and feedbacks received from the participants and other stake holders, it is realised that such programmes where hand on training component is attached are highly beneficial. We are encouraged and motivated to organize such programmes with further improvements in near future. In fact, SAIC Tezpur University has been conducting such programmes time to time but limited to internal candidates only. In the coming years, it is planned that the programmes will not be limited to internal participants but also be extended to external participants as well so that it caters the need of participants outside Tezpur University also.

ACKNOWLEDGEMENTS

The Department of Science and Technology (DST) New Delhi has sanctioned a project under Synergistic Training Program Utilizing the Scientific & Technological Infrastructure (STUTI) program to Panjab University Chandigarh. The Programme is supported on a Hub and Spoke model and the National Institute of Technology Srinagar is chosen as a Spoke institute under the Programme by Prof. G.R. Chaudhary. Special thanks go to Panjab University Chandigarh and especially to Prof. G.R. Chaudhary for selecting Tezpur University as a Spoke institute. We would also like to thank DST for funding such kinds of programmes. Support from SAIC is highly

appreciated without whom this programme would have not been possible. A big round of applause to the volunteers and the orgainising team members. This training program would not have been successful without their constant and active support. Thank you, dear students and organisning committee members for your contributions and enthusiasm in each and every aspect of the event. This also motivates us to conduct more program in the near future. The presence of the Honorable Vice Chancellor and his constant encouragement, despite his extremely busy schedule, reflects his commitment to the growth of the institute. Mr. Bunty Sarma from Panjab University has been the first point of contact from STUTI-PMU. His stepwise guidance has helped the orgainsers to run the programme smoothly. We extend our gratitude to Mr. Sarma. Last but not least, the organising committee want to put on record the help and support of all administrative and staff and everyone who has contributed to making this training program a grand success.

OUTCOME

These seven days unique STUTI training programme received overwhelming responses from institutes/ universities/colleges/industries across the country. Applicants were from different backgrounds such as physics, chemistry, food engineering and technology, material science, nanotechnology, biotechnology, life sciences, energy, mechanical, and chemical engineering. Although it was not possible to include all the applicants into the programme, but reasonably a good number of participants were selected with diversification with regard to location and background. The program enabled the participants to have a close look, acquire skill-based knowledge and hands-on training into the sophisticated analytical instruments, viz., TEM, SEM, XRD-both single crystal and powder, UV-Vis-DRS Spectrometer, FTIR spectrometer, HPLC, BET, GC-MS, LC-MS, Fluorescence spectrometer, etc. The participants were provided the elaborate descriptions on the working principle of the sophisticated instruments, sample preparation and some of the applications. Through the examples and hands on training, participants received expertise to gain deeper understanding of instrumental techniques, develop data analysis skill and interpretation skills. Most importantly, participants received opportunities to interact with the resource persons and technical persons one to one basis. We were happy to analyse some samples of the participants. Nevertheless, participants were also briefed

and demonstrated about the laboratory safety, instrument safety and precautions to be taken during running of the sophisticated instruments. Afterall, it was a package.

It is expected that the participants will also try to address social problems through knowledge and information gained from this programme.

FEEDBACK

From the feedback received from the participants and stakeholders, it seems that the programme was well-received by the participants. All the participants are happy and have shown their satisfaction in respect of the content, delivery, and presentations of all the topics covered during the presentation. Resource persons also conveyed positive feedbacks in respect of the programme. The organising committee took special interest in the foods provided to the participants and resource persons.

THANK YOU

With regards

Prof. Ashim J. Thakur and Prof. Pabitra Nath