PROCEEDINGS

HANDS ON TRAINING PROGRAM

Insights into analytical instrumentation for applied sciences

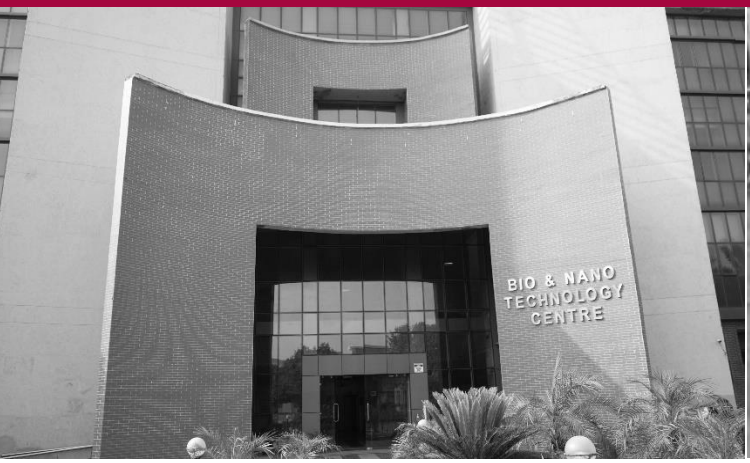
(Skilled India Progressive India)

May 10-17, 2022

Under

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

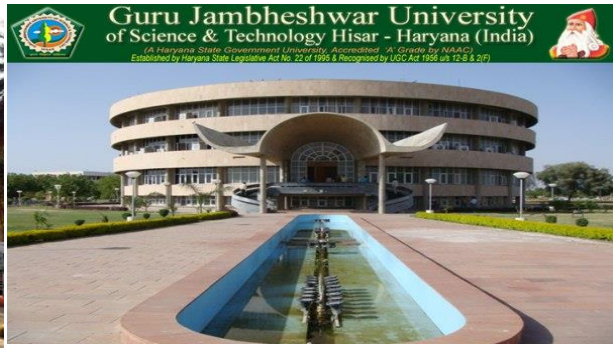
DBNT/CIL, GJUS&T and SAIF, PU



Guru Jambheshwar University of Science & Technology

GJUS&T, an 'A' grade accredited University by National Assessment and Accreditation Council (NAAC) was set up on October 20, 1995 under Haryana State Legislative Act. The aim behind the foundation of the University is to impart education on the frontiers of Technology, Pharmacy, Environmental Studies, Non-conventional Energy Sources, Mass Media and Management Studies. The University ranked 88th in NIRF-2021 ranking system and has a dedicated team of well qualified faculty members, engaged in teaching and research activities. The total number of papers published by the faculty in peer reviewed journals of national and international repute is more than 3400. The H-Index of the University has also gone up to 100 at present. The h-index of the University is 100 with more than 3400 Scopus indexed publications in reputed journals.

The University has been admitted for the Global Initiative Academic Network (GIAN) Phase-III Scheme of MHRD (MoE). The University has received highest grants (50 Crore) in Haryana State from RUSA that has been added to their stature and infrastructure. Further, the University has been sanctioned PURSE grant of Rs. 10.25 crores for research. DST-FIST grants have been awarded to Departments of Bio & Nano Technology, Pharmaceutical Science, Chemistry and Physics. Research project includes sponsorships by DRDO, DST, DBT, UGC, HSCST, MHRD, ADAMA & many more.



The university is twice been funded by TEQIP Scheme by World Bank, Board of Research In Nuclear Science (Department of Atomic Energy) and other agencies like MHRD, MHFW, Ministry of Defence (DRDO), Ministry of Social Justice and Empowerment, Ministry of Youth Affairs and Sports, National Board for Higher Mathematics, Distance Education Council, Ministry of Women and Child Welfare, Department of Scheduled Castes, Haryana. Further, International collaborative project includes sponsorships by DRDO, DST, Govt of India and Ministry of Science & Technology, Thailand which is currently implemented by this university jointly with Asian Institute of Technology, Bangkok, Thailand. The MoU with INFLIBNET for electronic dissemination of Ph.D thesis through open access in Shodhganga is in place.

In addition to this, Department of Bio & Nano Technology is being provided with MHRD grant for M.Sc. Biotechnology course by the Department of Biotechnology, Govt. of India since 2000, Bioinformatics Facility (BIF) grant by Department of Biotechnology, Govt. of India since 2006, HRD grant for M.Tech. Nano Science & Technology by Ministry of Science & Technology Govt. of India under Nano Mission program. DST-FIST grants have been awarded to Departments of Bio & Nano Technology, Department of Pharmaceutical Science, and Department of Applied Physics.

Department of Science and Technology (DST), 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), Promotion of new areas of Science and Technology with special emphasis on emerging areas, Coordination and integration of areas of Science & Technology having cross-sectoral linkages in which a number of institutions and departments have interest and capabilities, Undertaking or financially sponsoring scientific and technological surveys, research design and development, where necessary and Support and Grants-in-aid to Scientific Research Institutions, Scientific Associations and Bodies. DST has many scientific and engineering programmes that are aimed to promote research in science. It includes creation of Mega Science facilities and launch Mega Science projects in and out of the country to improve access to such state-of-the-art facilities for the Indian scientific community, especially from the academic sector. Because of technical complexities and requirement of large resources, such projects are manifestly multi-agency, multi-institutional and, quite often, international in character.

DST and the Department of Atomic Energy (DAE) are jointly promoting most of such projects in the country. Another innovative program is, Innovation of Science Pursuit for Inspire Research (INSPIRE) for attracting of young talent to science. 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. It has four schemes viz. Fund for Improvement of S&T Infrastructure in Universities and Higher Educational Institutions (FIST), Promotion of University Research and Scientific Excellence (PURSE), Sophisticated Analytical Instrument Facilities (SAIF), Sophisticated Analytical & Technical Help Institutes (SATHI) and Synergistic Training Program Utilizing the Scientific and Technological Infrastructure (STUTI). The objectives of these program at large are establishment of R&D labs and centers and further upgradation of research facilities orienting towards creating a self-reliant India.

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

The Scheme '**STUTI**' is intended to build human resource and its knowledge capacity through open access S&T infrastructure across the country. 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.

Department of Bio & Nano Technology, GJUS&T

Department of Bio & Nano Technology is marked by rigorous academic and research with incredibly talented individuals. The Department offers Dual Degree B.Sc. (Hons) Biotechnology- M.Sc. (Biotechnology), M.Sc. (Biotechnology), M.Sc. (Microbiology) and M.Tech. (Nano Science and Technology) as well as three Ph.D. Programs in Biotechnology, Microbiology and Nano Science & Technology. We have emerged as a centre of excellence and innovation in imparting quality teaching and training to propagate multi-disciplinary research activities in diverse field of biological science with a focus on Plant Biotechnology, Animal Biotechnology, Microbial Biotechnology and Nano Biotechnology. The department train and mentor the next generation of scientists in diverse fields of life-science-research blended with cutting edge technologies in service of mankind at all levels. Diverse community of students, staff, and faculty of all cultural and ethnic backgrounds, gender identities, and individuals with disabilities is one of the highest priorities of the department. Together, we work to discover new knowledge for understanding and decoding some of the world's most challenging problems related to human health, energy, food, and the environment. We place high value on creating and nurturing a supportive environment for studying, working, and living that promotes physical and mental well-being and facilitates each individual to attain their full potential.

Department is equipped with ultra-modern equipment's with state of the art laboratory facilities and has dedicated faculty engaged in the development of nano biosensors for healthcare and environment monitoring, synthesis of advanced functional materials, nanobiotechnology, genetic improvement of plant & microbes, metabolomics transcriptomics and bioinformatics approaches. Department has excellent Bioinformatics facility with financial assistance under BIF Program from the Department of Biotechnology, Department of Science & Technology, Ministry of Science & Technology, Govt. of India, New Delhi. Department has been supported under SAP/DRS-II Program from UGC, New Delhi, FIST-II from Department of Science and Technology, Ministry of Science & Technology, Govt. of India, New Delhi and TEQIP III -World Bank Assisted Project.

The vision and mission of the department is to train competent technocrats and creating knowledge power house in the areas of Biotechnology, Molecular Biology, Microbiology, Genomics, Metabolomics, Genetic Engineering and Nano Science & Technology. Further, it aims to expose students to specialized areas of Plant Biotechnology, Microbial Biotechnology, Food Biotechnology, Nano Biotechnology and Animal Biotechnology along with developing nanodevices and sensors for agricultural, environment, food and medical applications. The department also conducts applied research in Plant and Microbial Biotechnology, Genomics, Metabolomics, Enzyme Technology and Nano Science & Technology with a focus on identified areas with high economic impact.

Dr. APJ Abdul Kalam Central Instrumentation Laboratory (CIL), Hisar

The Dr. APJ Abdul Kalam Central Instrumentation Laboratory (CIL) is established for the students, research scholars and teachers of the university who are actively engaged in R&D activities in the emerging areas of Science, Technology & Engineering. The CIL is presently having sophisticated instruments like Nuclear Magnetic Resonance (NMR) Spectrometer (400MHz), Atomic Absorption Spectrometer (AAS), UV-VIS-NIR Spectrophotometer, Fourier Transform Infrared (FTIR) Spectrometer, Differential Scanning Calorimeter (DSC), Microwave Plasma Atomic Emission Spectrometer (MP-AES), Microwave Synthesizer, Mass Spectrometer - Liquid Chromatography Mass Spectrometry (LC-MS/MS QTOF), Ultra High Performance Liquid Chromatography (UHPLC), High Resolution Field Emission Scanning Electron Microscope with EDS (FE-SEM), Raman Spectrometer, Flash Chromatography, Rheometer, Multipurpose Versatile XRD System (XRD) and other sophisticated instruments are under purchase process e.g.. The CIL cater to the needs of the students, research scholar and teachers of this university as well as other educational institute and industry in order to promote research activities.

SAIF/CIL, Panjab University

SAIF/CIL 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

Highlights of the Training Program

Analytical instrumentation encompasses a wide range of instruments whose principal purpose is to qualitatively and quantitatively analyze samples; to visualize them on nano-micron scale; to determine the chemical makeup of a sample and the quantity of each component within a sample. Analytical instrumentation includes those used within spectroscopy, mass spectrometry, microscopy, electrochemical analysis, thermal analysis, separation analysis, and the various hybrid technologies (e.g. GC-MS and HPLC-MS). This hands-on training program is organized for those interested in characterization techniques at a basic and advanced level. The scope of the training program can be extended to personnel working across different disciplines- nanotechnology, biotechnology, chemistry/physics, material science, engineering, biomedicine, veterinary sciences, agricultural research along with commercially influenced energy, pharma, and bioprocess industry.

The training program aims to review the high-end characterization techniques investigating samples at nanoscale dimension. Moreover, there will be focus on visualization of the instruments in action, hands-on experience, and discuss cutting edge developments in both instrumentation and research. Apart from informative lectures, hands-on experience will be provided on the synthesis of nanomaterials followed by some of the most relevant characterization techniques (such as XRD, FESEM, HRTEM, AFM, STM, NMR, DLS, Confocal, Raman spectroscopy, MS to mention a few) for qualitative and quantitative analysis of synthesized samples. The platform will also give opportunity to meet and greet a myriad of researchers, industry professionals and academia experts with common interest.

Learning Outcomes of the Program

At the end of the training, participants will be conversant with the following:

- EXPLAIN THE THEORETICAL ASPECTS OF KEY ANALYTICAL TECHNIQUES INCLUDING ELECTON MICROSCOPY, PROBE MICROSCOPY, X-RAY DIFFRACTION, MASS SPECTROMETRY
- SYNTHESIS OF VARIOUS NANOMATERIALS VIA DIFFERENT ROUTES
- ELECTROMAGNETIC ABSORPTION ANALYSIS OF NANOMATERIALS VIA SPECTROSCOPIC TECHNIQUES SUCH AS UV-VISIBLE, FTIR, AND RAMAN SPECTROSCOPY ALONG WITH SIZE AND CHARGE DETERMINATION USING DLS ANALYZER.
- UNDERTAKE THE CORRECT SAMPLE PREPARATION AND CHARACTERIZATION PRIOR TO ANALYSIS BY THE CHOSEN INSTRUMENTATION
- MICROSCOPIC IMAGING OF SYNTHESIZED NANOMATERIALS USING SEM, TEM, AFM, AND STM
- CHEMICAL STRUCTURE ANALYSIS OF COMPOUNDS WITH THE AID OF NMR AND MASS SPECTROSCOPY

Eminent Resource Persons

Prof Neeraj Dilbaghi
Dean Research
Chairperson,
Department of Bio & Nano Technology,
GJUS&T, Hisar

Dr Rakesh Mishra
Application Enigineer,
IR Technology,
Rikagu

Prof G. R. Chaudhary
Director, SAIF/CIL
Professor,
Department of Chemistry,
Panjab University, Chandigarh

Dr Bhawani Shankar Joshi
Application Scientist,
Bruker India Sci Pvt Ltd

Dr Sandeep Kumar
STUTI Program Coordinator
Department of Bio & Nano Technology,
GJUS&T, Hisar

Dr T. Oikawa
Application Scientist,
JEOL Asia,
Japan

Dr Vikas Rishi
Scientist,
NABI, Mohali

Dr Nitin Singhal
Scientist E,
NABI, Moahli

Dr Ashutosh Valavade
Application Scientist
Park Systems,
Bengaluru

Dr Jemy James
Application Scientist,
WITec,
Bengaluru

Dr Nithin Sanjeev
Application Scientist,
SCIEX,
Bengaluru

Prof. P. Venugopalan
Department of Chemistry,
Panjab University, Chandigarh

INVITATION: INAUGURAL CEREMONY

DEPARTMENT OF BIO & NANO TECHNOLOGY
and
CENTRAL INSTUMENTATION LABORATORY

GURU JAMBHESHWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR

Cordially invites you to the inauguration of

Hands on Training Program

INSIGHTS INTO ANALYTICAL INSTRUMENTATION FOR APPLIED SCIENCES

May 10 -17, 2022

CHIEF GUEST

Prof. B. R. Kamboj
Hon'ble Vice Chancellor,
GJUS&T & CCSHAU, Hisar

(Skilled India Progressive India)

in association with

GUEST OF HONOUR

Prof. Avnesh Verma
Registrar,
GJUS&T, Hisar

Sophisticated Analytical Instrumentation Facility, Panjab University Chandigarh

Under

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

Organizers :

Dr. Sandeep Kumar
STUTI Training Program Coordinator,
GJUS&T, Hisar

Prof. G. R. Chaudhary
STUTI Coordinator-PMU,
Panjab University,
Chandigarh

Prof. Neeraj Dilbaghi
Dean Research,
GJUS&T, Hisar

Prof. Devinder Kumar
Director CIL,
GJUS&T, Hisar

Venue : Seminar Hall 2, Ch. Ranbir Singh Auditorium, GJUS&T, Hisar

STUTI

The Scheme **'Synergistic Training program Utilizing the Scientific and Technological Infrastructure' (STUTI)** is supported by the Department of Science and Technology, Government of India is intended to build human resources and its knowledge capacity through open access to S&T Infrastructure. It envisions hands-on training and sensitization of the state-of-art instruments in various institutes/departments having availed projects under FIST/PURSE/CURIE/ SAIF/SATHI schemes.

Dignitaries

The training program commenced with the patronship of Honorable **Prof. B.R. Kamboj**, Vice-chancellor, GJUS&T and inaugurated by Worthy **Chief Guest Prof. Avnesh Verma**, Registrar, GJUS&T, Hisar, India. **Prof. Devinder Kumar**, Director CIL and **Prof. Neeraj Dilbaghi**, Dean Research from GJUS&T as the organizers of the STUTI supported training program graced the event with their presence. **Dr. Sandeep Kumar** as the coordinator of the STUTI training program at GJUS&T, Hisar welcomed **Prof. Ganga Ram Chaudhary** who is the Coordinator of the STUTI Program-PMU, PU, Chandigarh, and **Guest of Honor** for this program.

Day 1

The 7 days hands-on Training Program on "**Insights into Analytical Instrumentation for Applied Sciences**" commenced from 10th-17th May 2022 at the Department of Bio & Nano Technology (FIST Assisted) & Central Instrumentation Laboratory (PURSE Supported), GJUS&T, Hisar, under STUTI program in association with Sophisticated Analytical Instrumentation Laboratory (SAIF), Panjab University, Chandigarh.

Inauguration Ceremony: Day 1

Welcome Note

Prof. Neeraj Dilbaghi, Dean Research from GJUS&T gave cordial welcome to the Chief Guest, Guest of Honour, all Dignitaries, and all the participants of the program. He enlightened about the scope of nanotechnology and made everyone aware about the facilities that are present in the University for advanced research.

The technical manual of the training program was unvieled by the Chief guest in the presence of all the dignitaries and participants

Vote of Thanks

At the end, **Prof. Devinder Kumar** presented the vote of thanks to the dignitaries and wished good luck to all the participants and organizing team for the training program. He also briefed about all the facilities available in CIL, GJUS&T, Hisar.

About Training Program

Dr. Sandeep Kumar, STUTI program co-ordinator highlighted the key points of the training program, its schedule and also emphasized the importance of the training program. He thanked all the dignitaries, participants, and organizing team. He briefed about the program that it is going to held for first five days at GJUS&T, Hisar while sixth day and seventh day will be scheduled at NABI, Mohali and SAIF, PU, Chandigarh, respectively. He also told which techniques will be taken up during this training program and what is the significance of that particular technique for research. How this specific training program is focused on the development of skilled force was also mentioned. He briefed about the **30** participants from **30** different institutes/universities have been participating in this training program. He motivated all the participants to attend the workshop with great enthusiasm for their better research, career, and future.

About DST-STUTI Scheme

Prof. Ganga Ram Chaudhary, Director, SAIF, PU, Chandigarh emphasized on the goals and visions of the STUTI scheme to the participants. He told about the motive of Govt. of India behind this scheme, centers organizing the different awareness and training programs under this scheme. He also mentioned about the great success achieved from previously organized programs and visionary initiatives for future.

Addressal from Chief Guest

Worthy Registrar **Prof. Avnesh Verma** addressed the participants and highly appreciates the efforts of the organizing committee members of the training program for the commencement of such a wonderful event. He critically mentioned the importance of the research and its application concerning **technology transfer** for the benefit of society.

Day 1

Lecture 1

The first lecture on Day 1 was delivered by Prof Neeraj Dilbaghi, Dean Research and Chairperson, Department of Bio and Nano Technology, GJUS&T, Hisar, on the Scope of Nano Technology for futuristic applications. He briefed the revolutions nanotechnology in life and also in national economy. The products which are based on nanomaterials and are available in market in mass numbers were discussed. The properties and future applications of nanomaterials were discussed with the participants in a very interactive manner. The audience was completely indulged in the talk and gained insights into every nanotechnology

Lecture 2

Next, a very informative lecture was given by Prof G. R. Chaudhary, Director, SAIF, Panjab University, Chandigarh on different strategies employed for synthesis of a variety of nanostructures. The information on the techniques available for characterization of synthesized nanomaterials was also shared with the participants. Prof G. R. Chaudhary gave an overview of some of the research works performed by him and his team in the past few years. The different types of nanostructures synthesized and employed for different applications such as catalysis, adsorption, and anti-microbial properties were communalized with the audience.

Day 1

In the second half of Day 1, the different nanomaterials such as graphene quantum dots, terbium-based metal-organic framework, zinc oxide nanoparticles, and cobalt oxide nanoparticles were synthesized via different approaches like pyrolysis, precipitation, and microwave methods. This was followed by the characterization of synthesized nanomaterials using various spectroscopy techniques such as UV-Visible, FTIR spectroscopy along with size and zeta potential measurements by dynamic light scattering (DLS).

Day 2

On Day 2, speakers Dr. Sandeep Kumar and Dr. Ashutosh Valavade from GJUS&T and Park Systems, respectively delivered lectures on measurement methods using Particle Size Analyzer and Scanning Probe Microscope. The lectures were interactive followed by Q&A sessions.

Lecture 1

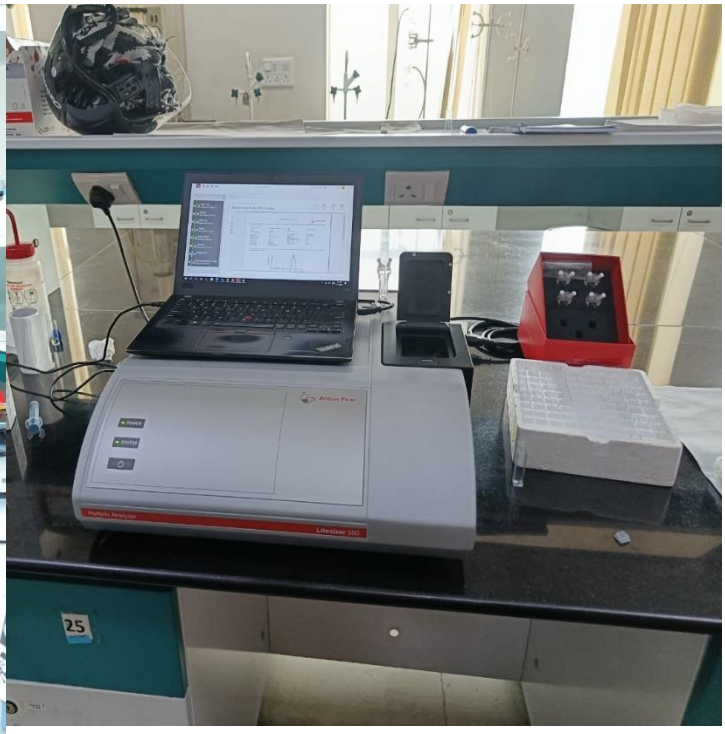
The first lecture of the day on use of Dynamic Light Scattering (DLS) for measurement of particle size and zeta potential was given by Dr. Sandeep Kumar. He detailed about the basic principle, working, analysis, and interpretation of the data obtained by DLS measurements.

Lecture 2

The second lecture of day was delivered by Dr. Ashutosh on different types of Scanning Probe Microscopes. The basics, instrumentation and working of scanning probe microscopes were discussed. In his talk, the information on AFM, STM, and MFM was given with elaboration on various scanning modes. The attractive images of a number of samples analysed by SPM were shown in the presentation given by the speaker with special light on the applications. The use of artificial intelligence (AI) in recent AFM instruments was also demonstrated.

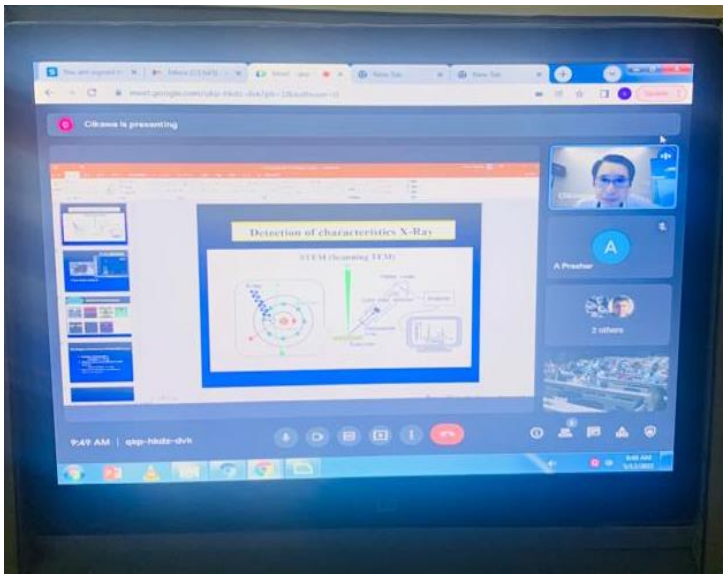
Day 2

During the second half, hands-on training on Particle Size Analyzer (DLS), Field Emission Scanning Electron Microscopy (FESEM), Atomic Force Microscopy (AFM) was given to the participants. The research samples of few participants were analyzed using DLS and FESEM during the program. The hands-on session on AFM in an interactive manner by the technical person levelled up the enthusiasm of participants.



Day 3

The day 3 of DST supported STUTI training program was successfully completed at GJUS&T Hisar. Experts delivered a lecture on advanced instruments technology, microscopy different models and applications. Dr. Oikawa San, JEOL systems, Japan delivered a wonderful lecture on recent advancement in HR-TEM microscopy. Dr. Sandeep Kumar, GJUS&T, Hisar emphasized the talk on different attachments in SEM.



Lecture 1

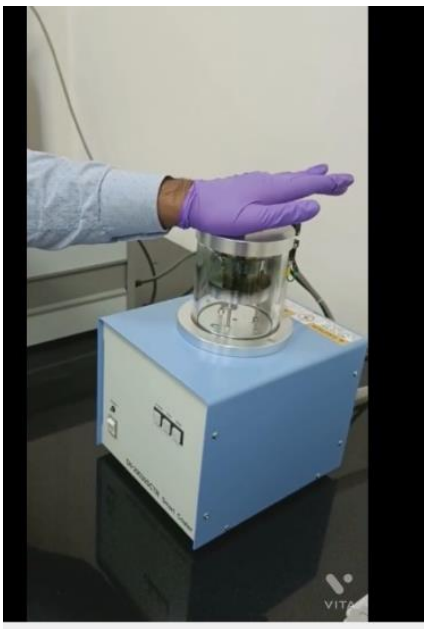
Dr. Oikawa San from Japan delivered the first lecture of the day on “Recent Advancements in HR-TEM”. He elaborated on the technological advancements that have been achieved for HR-TEM imaging during the last few years and how these advancements are giving a great aid to research field. His lecture was very informative with special focus on resolving the queries of participants on how to deal with analysis of different types of samples using HR-TEM efficiently.

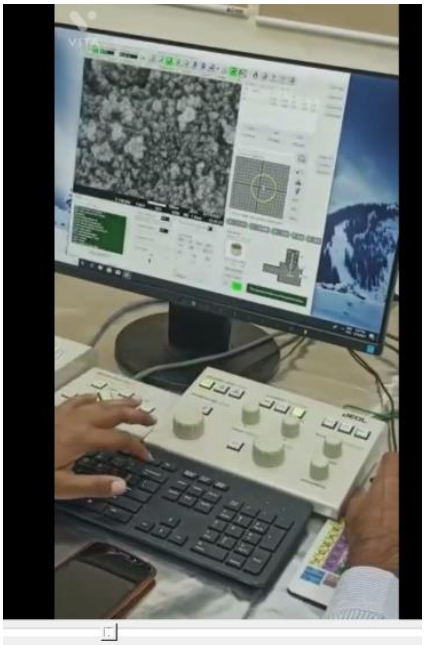
Lecture 2

Dr. Sandeep Kumar from GJUS&T gave second lecture of the day on “General introduction to electron microscopy” covering principle, instrumentation, sample preparation, working, and data analysis. The different aspects and arrangements of SEM and TEM were detailed along with the relevance of electron microscopy for high-end research. The revolution made in the field of electron microscopy and differences between different types of electron microscopes were also discussed in the detail.

Day 3

In the experimental session of Day 3 during the second half, an interactive hands-on training on field emission scanning electron microscopy (FESEM) and XRD was given to the participants. The samples of the participants were analysed in Dr. A.P.J Abdul Kalam central instrumentation laboratory using FESEM and XRD instruments. The participants were happy and motivated with the results of the analysis.





Day 4

On Day 4, speakers from industries Dr. Rakesh Mishra, IR Technology, Rigaku delivered talk on XRD principle and applications on recent advancement. Dr. Jeny James, WItec, Bengaluru talked about technical note on Raman spectroscopy.

Lecture 1

The first lecture of the day on XRD: Principles and Applications delivered by Dr. Rakesh Mishra was based on the basics, principles, instrumentation, working, and data analysis using XRD. He gave more emphasis on the types of samples that can be analysed, technical precautions that need to be taken care of when using XRD. The aspects which contribute towards better results and avoid false results were also mentioned. The interactive session after the talk cleared the concepts of participants regarding XRD data interpretation.

Lecture 2

Raman Spectroscopy is a very promising technique for the characterization of materials. Therefore, the second talk of the day was given on use of Raman spectroscopy covering different aspects such as principle, instrumentation, sample analysis and data interpretation. The recent advancements available with the Raman Spectroscope along with applications were also mentioned. The Q&A session at the end of the lecture was quite interactive and informative for all the participants.

Day 4

During second half, an interactive hands-on training on Raman spectroscopy and XRD was provided to the participants. The participant's samples were analysed using Raman spectroscopy, XRD and FESEM in Dr. A.P.J Abdul Kalam central instrumentation laboratory. Results obtained from the sample analysis in CIL was beyond expectations. Participants were grateful and motivated with the hands-on training on Raman spectroscopy and XRD.

Day 5

On Day 2, Mr. Nithin Sajeev, SCIEX, Bengaluru delivered a lecture on Mass spectroscopy an essential tool for characterization. Dr. Bhawani Shankar Joshi, Bruker India Scientific Pvt Ltd delivered a talk on NMR, basics, instrumentations, data interpretation and applications.

Lecture 1

Mr. Nithin Sanjeev delivered the first lecture of Day 5 on Mass spectroscopy. The mass spectroscopy lecture starts with a presentation on basics, principle, instrumentation, and working of mass spectrometer. Mr. Nithin then discussed how mass spectroscopy can determine the molecular weights of different types of compounds. He also explained several techniques for ionization and different types of Mass Spectrometers. He ended the lecture with evaluating a traditional electron impact mass spectrum.

Lecture 2

The second lecture of day was delivered by Dr. Bhawani Shankar Joshi from Bruker India on Nuclear Magnetic Resonance. This lecture aimed at making participants familiar with using NMR on a day-to-day basis and deepen their understanding of how NMR experiments work and the theory behind them. The data analysis and interpretation were explained to the participants along with the application areas of NMR in research, pharmaceuticals, industry, and others.

Day 5

During the second half, interactive hands-on training on Mass spectroscopy and NMR was given to the participants. Sample preparation, analysis and interpretation of results to identify the composition of the materials were performed during the training in the central instrumentation laboratory. Participants were happy with the hands-on training on Mass spectroscopy and NMR. They were satisfied with the results and analysis of the samples.

Day 6

On Day 6, Dr Vikas Rishi and Dr Nitin Singhal, Scientists from NABI, Mohali delivered lectures on Confocal microscopy and Inductively-coupled plasma mass spectroscopy, respectively. The lectures were very informative with special focus on their use in research and industry.

Lecture 1

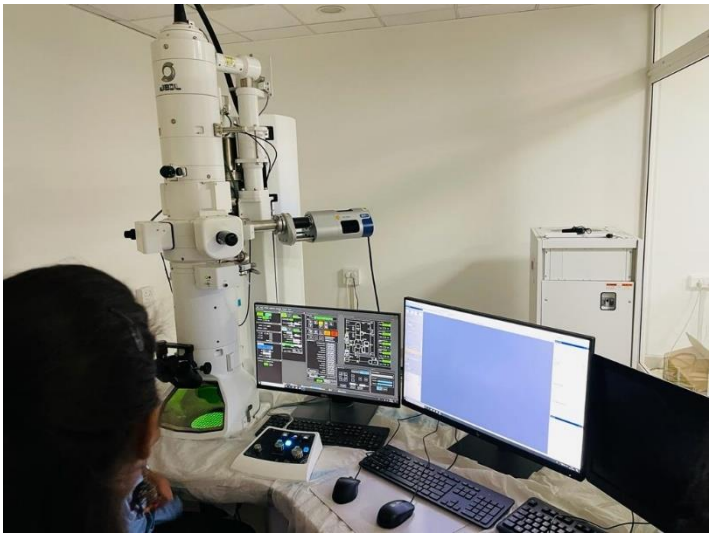
The first lecture of the day 6 was on confocal microscopy by Dr Vikas Rishi covering aspects such as use of this powerful technique for developing high resolution 3-D images, special arrangements in confocal microscope as compared to simple optical microscopes. The confocal microscope can aid in 3-D reconstruction of a sample from stacks of images. Use of different laser source and reduction of out-of-focus signals make confocal pictures crisper and clearer. The recent advancements in new confocal instruments and wide variety of applications of confocal microscope were also discussed.

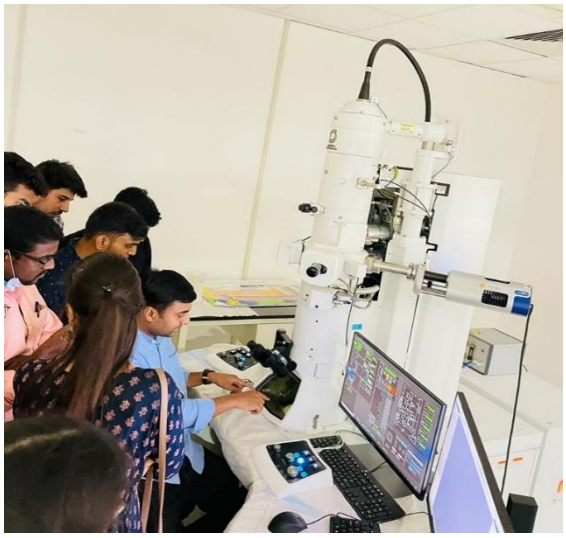
Lecture 2

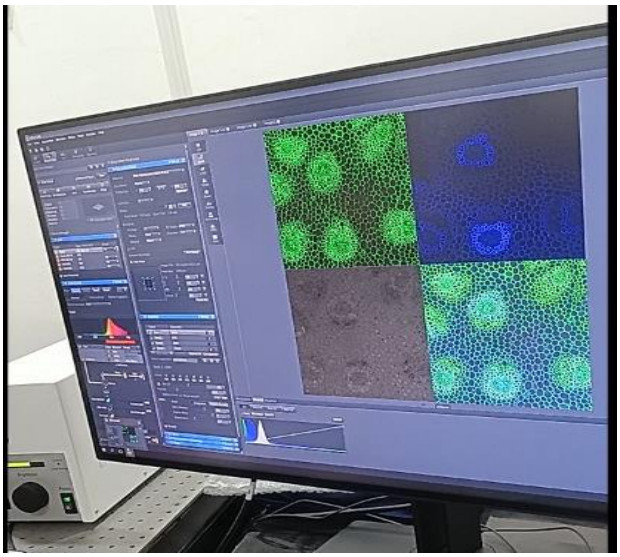
The second lecture of day was delivered by Dr. Nitin Singhal on ICP-MS in which he elaborated the basics, working principle with special focus on how this high-end technique is employed for research and industrial purposes. He made participants familiar with his own research work done on ICP-MS regarding removal of pollutants, adsorption, and catalysis and how this particular technique helps in gaining extraordinary results in a very sensitive manner. In the interactive session followed by the lecture, Dr Nitin answered the queries of the participants so that they are able to use it for their research in a fruitful manner.

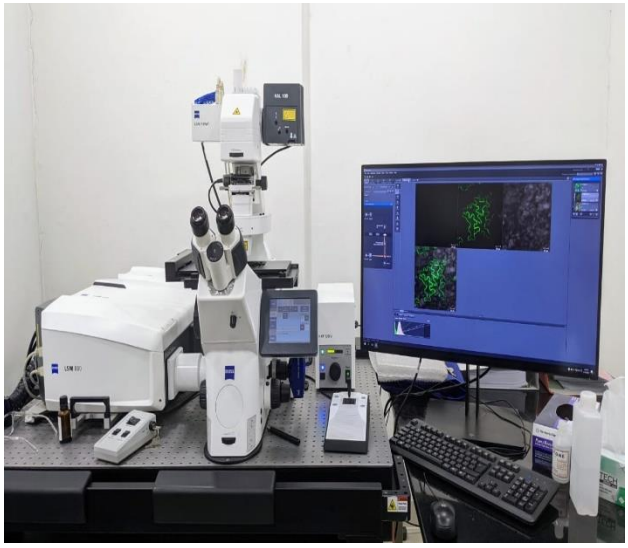
Day 6

During the second half, practical demonstration and hands-on training was given to the participants on how to perform sample imaging using confocal microscope via different modes to obtain variety of information. Next, ionic samples were analysed using ICP-MS which is employed to wide category of applications in research and industry. The participants learned a lot from the practical session and were keen to analyse their sample with these techniques in future works.









Day 7

The day 7 started with lecture on single-crystal X-ray Diffraction by Prof P Venugopalan and Dr. Subash C Sahoo from Department of Chemistry, Panjab University, Chandigarh. The last lecture session of the training program gave new insights into classical XRD technique via different techniques for preparaing single crystals, precautions to be taken care of while preparing and analyzing single crystal, The lectures was followed by an interactive Q&A session.

The lecture was followed by the practical demonstration of sample analysis via High Resolution- Transmission Electron Microscopy and Single Crystal- XRD. The participants learned a lot about these techniques which are not widely available in institutes and universities around the country. They were also motivated to get their samples analysed from Panjab University for research and industrial purposes.

VALEDICTORY

Hands on Training Program

INSIGHTS INTO ANALYTICAL INSTRUMENTATION FOR APPLIED SCIENCES

May 17, 2022

(Skilled India Progressive India)

CHIEF GUEST

Prof. K K Bhasin
Emeritus Professor,
PU, Chandigarh

GUEST OF HONOUR

Prof. Avnesh Verma
Registrar,
GJUS&T, Hisar

Organised by

DEPARTMENT OF BIO & NANO TECHNOLOGY
and
CENTRAL INSTUMENTATION LABORATORY

GURU JAMBHESHWAR UNIVERSITY OF SCIENCE AND TECHNOLOGY, HISAR

under

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

Venue : SAIF Conference Hall, PU, Chandigarh

DAY-7 VALEDICTORY

DIGNITARIES

The valedictory session of the training program was commenced in the presence of honourable Chief Guest Prof. K.K. Bhasin, NASI platinum jubilee fellow and Emeritus professor, PU; honourable Guest of Honours Prof. Avnesh Verma, Registrar, GJUS&T, Hisar and Prof. Neeraj Dilbaghi, Dean Research, GJUS&T, Hisar.

FELICITATION

The welcome note from all the dignitaries followed by the event summary and felicitation were the key highlights of the valediction.

REPORT OF TRAINING

Dr. Sandeep Kumar, Associate Professor, Department of Bio & Nano Technology, GJUS&T, Training Program Coordinator presented the overall report of the training program. The feedback of the participants were received at the end.

FEEDBACK FROM PARTICIPANTS

Participants were happy with the hands-on training provided during the training program and cost-free sample analysis. They felt motivated and highly appreciated the initiative taken by the DST, Govt. of India for creating a platform where all researchers can enhance their technical skill through open access to S&T infrastructure. They were grateful to the dignitaries, program coordinators, organizers, support staff, technical support and everyone for the successful commencement of the STUTI training program.

List of Participating Universities

CSIR-IMTECH, Chandigarh

UIET, PU, Chandigarh

NPL, New Delhi

GJUS&T, Hisar

University of Delhi, Delhi

Charotar University of Science and Technology (CHARUSAT), Anand

Anna University, Chennai

Central University of Haryana, Mahendragarh

CCS Haryana Agricultural University, Hisar

DCRUST, Murthal

Central University of Himachal Pradesh, Shahpur

Loganatha Narayanasamy Government College, Ponneri

List of Participating Universities

Vasantdada Sugar Institute, Manjri Bk. Pune

Central University of Himachal Pradesh, Shahpur

Pondicherry University, Puducherry

TIET, Patiala

University of Rajasthan, Jaipur

Mohanlal Sukhadia University, Udaipur

Vellore Institute of Technology, Vellore

KPR Institute of Engineering and Technology, Coimbatore

Periyar University, Salem Tamilnadu

University of Lucknow, Lucknow

Dr. Willmar Schwabe India Pvt. Ltd., Noida

Amity University of Biotechnology, Noida

The Maharaja Sayajirao University of Baroda, Vadodara

Saurashtra University, Rajkot

LIST OF PARTICIPANTS


Bhawana Bisht


D. Elango


Monika


Prashant Kumar


Himani Bhoi


Vishal Singh


Sonam Sharma


G. Sattanathan


Soumya Sharma


Mudra Jadav


Meenakshi


N. Durairaj


R. Pavithra


Karuna Jain


Pooja Kumari


Sumit Mittal


Lokesh


Vikrant Singh


Suman Kumari


Sreejith O. V.

LIST OF PARTICIPANTS


Murali Manoj G


Chintan M. Panchasara


Meena Jayaprakash


Gaurav Bhanjana


Sitara Menon


Sangeeta


Ithape Dinesh Manoha


Aashima Mahajan


Sonam Kumari


Ravinder


Bahareh Dabaghiannejad


Shikha Jain

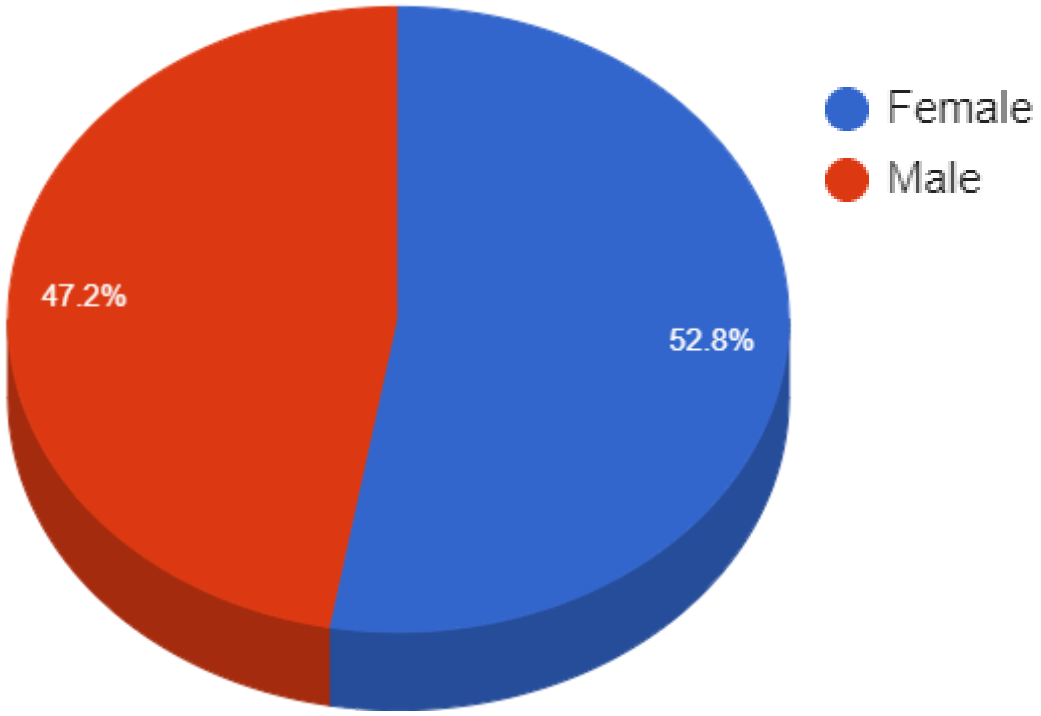

Jyotsana Mehta


Manjit Singh Jadon

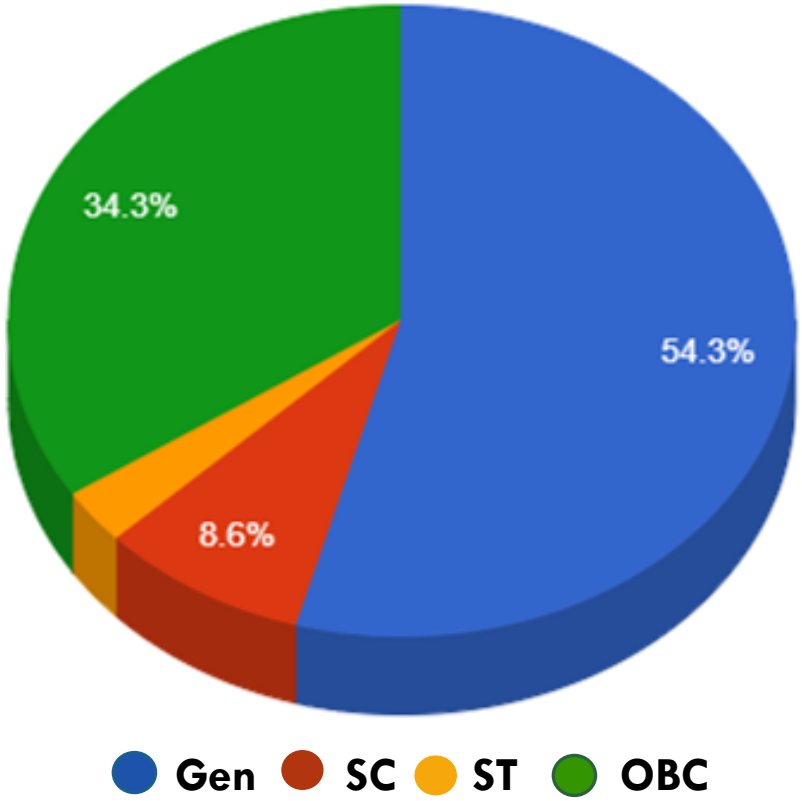

Yogesh


Priyanka

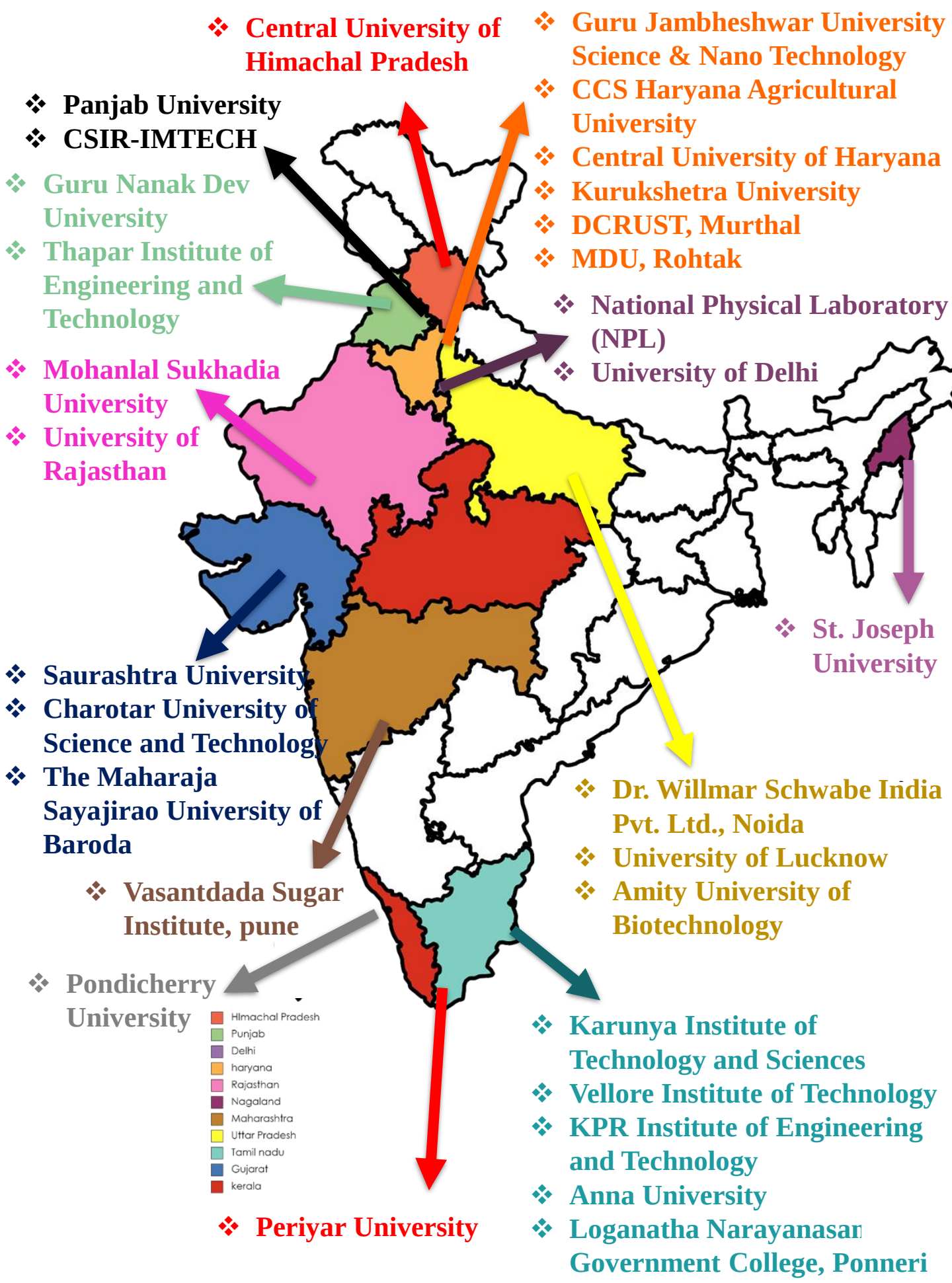
PERCENTAGE OF MALE AND FEMALE PARTICIPANTS IN TRAINING PROGRAM



PERCENTAGE OF PARTICIPANTS CATEGORY WISE



STATE WISE DISTRIBUTION OF PARTICIPANTS



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ORGANIZERS

Dr. Sandeep Kumar

Haryana Yuva Vigyan Ratna Awardee,
STUTI Training Program Coordinator
Bio & Nano Technology, **GJUS&T**, **Hisar**

Prof. Devinder Kumar

Best Teacher Awardee (CRSI)
Director, CIL
GJUS&T, **Hisar**

Prof. Neeraj Dilbaghi

Institutional Coordinator (RUSA)
Dean, Research
GJUS&T, **Hisar**

Prof. G.R. Chaudhary

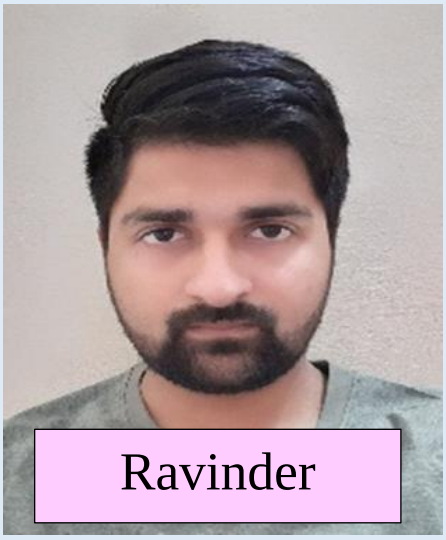
Director, SAIF/CIL STUTI
Coordinator - PMU
Panjab University, **Chandigarh**

"Synergistic Training program Utilizing the Scientific and Technological Infrastructure (STUTI) Program – 2021n

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. This will be achieved by organizing short term courses/ workshops on the awareness, use and application of various instruments and analytical techniques. The Scheme will provide grants for organizing different training programs.

Organising Team Members


Sonam Kumari


Ravinder


Bahareh


Shikha Jain


Jyotsana Mehta


Manjit Singh


Gaurav


Monika

News Today

गुजवि में सात दिवसीय प्रशिक्षण कार्यक्रम जारी

हिसार। गुरु जम्भेश्वर विश्वद्यालय में एसएआईएफ, पंजाब विश्वविद्यालय, चंडीगढ़ के सहयोग से डीएसटी समर्थित सात दिवसीय स्तुति प्रशिक्षण कार्यक्रम जारी है। एससीआईईएक्स, बेंगलुरू के नितिन संजीव ने लक्षण वर्णन के लिए एक आवश्यक उपकरण मास स्पेक्ट्रोस्कोपी पर व्याख्यान दिया। ब्रूकर इंडिया साइंटिफिक प्राइवेट लिमिटेड के डॉ. भवानी शंकर जोशी ने एनएमआर, मूल बातें, इंस्ट्रूमेंटेशन, डेटा व्याख्या और अनुप्रयोगों पर वार्ता की।

गुजवि में 'इंसाइट्स इंटू एनालिटिकल इंस्ट्रूमेंटेशन फॉर एप्लाईड साईंसिज' विषय पर प्रशिक्षण आरंभ

हिसार/ 11 मई/ रिपोर्टर

गुरु जम्भेश्वर विज्ञान एवं प्रौद्योगिकी विश्वविद्यालय के बायो एंड नैनो टैक्नोलॉजी विभाग (एफआईएसटी समर्थित) व सैंट्रल इंस्ट्रूमेंटेशन लैब (गुजविप्रौवि, पर्स समर्थित) द्वारा एवं सोफिस्टिकेटिड एनालिटिकल इंस्ट्रूमेंटेशन लैबोरेटरी, पंजाब विश्वविद्यालय, चण्डीगढ़ के सहयोग से स्तुति कार्यक्रम के अंतर्गत 'इंसाइट्स इंटू एनालिटिकल इंस्ट्रूमेंटेशन फॉर एप्लाईड साईंसिज' विषय पर सात दिवसीय व्यावहारिक प्रशिक्षण कार्यक्रम शुरू किया गया है। प्रशिक्षण कार्यक्रम का शुभारंभ विश्वविद्यालय के कुलपति प्रो. बलदेव राज कम्बोज ने किया। विश्वविद्यालय के कुलसचिव प्रो. अवनीश वर्मा ने बतौर मुख्यातिथि कार्यक्रम का उद्घाटन किया। सीआईएल के निदेशक प्रो. देवेन्द्र कुमार व डीन रिसर्च प्रो. नीरज दिलबागी गुजविप्रौवि के कार्यक्रम के संयोजक हैं। डॉ. संदीप कुमार कार्यक्रम के समन्वयक हैं। इस कार्यक्रम में पंजाब विश्वविद्यालय, चंडीगढ़ के समन्वयक प्रो. गंगा राम चौधरी हैं। प्रो. चौधरी गुजविप्रौवि में विशिष्ट अतिथि के रूप में उपस्थित रहे। कुलसचिव प्रो. अवनीश वर्मा ने कहा कि इस प्रकार के विशेष प्रशिक्षण कार्यक्रमों के आयोजन के लिए किए गए समिति के सदस्यों के प्रयास अत्यंत सराहनीय हैं। उन्होंने समाज के हित के लिए प्रौद्योगिकी हस्तांतरण के संबंध में अनुसंधान और इसके अनुप्रयोग के महत्व का उल्लेख किया। प्रशिक्षण कार्यक्रम के लैब मैनुअल का अनावरण सभी प्रतिभागियों की उपस्थिति में कुलसचिव प्रो. अवनीश वर्मा व अन्य गणमान्य व्यक्तियों द्वारा किया गया। विशिष्ट अतिथि प्रो. गंगा राम चौधरी ने स्तुति योजना के लक्ष्यों और दृष्टिकोणों पर प्रकाश डाला। इस प्रशिक्षण कार्यक्रम में लगभग देशभर से 90 शिक्षण संस्थानों से 300 से ज्यादा प्रतिभागियों ने आवेदन किया था जिनमें से 30 प्रतिभागियों का इस कार्यक्रम के लिए चयन किया गया। डीन रिसर्च प्रो. नीरज दिलबागी ने मुख्य अतिथि, विशिष्ट अतिथि और कार्यक्रम के सभी प्रतिभागियों का स्वागत किया। डॉ. संदीप कुमार ने प्रशिक्षण कार्यक्रम के प्रमुख बिंदुओं, इसकी समय सारिणी पर प्रकाश डाला और प्रशिक्षण कार्यक्रम के महत्व पर बल दिया।

इनसाइट्स इंटू एनालिटिकल इंस्ट्रूमेंटेशन फॉर एप्लाइड साइंसिज पर प्रशिक्षण शुरू

सिटी रिपोर्टर • जीजेयू बायो एंड नेनो टेक्नोलॉजी विभाग व सेंट्रल इंस्ट्रूमेंटेशन लैब की तरफ से स्तुति कार्यक्रम के अंतर्गत 'इनसाइट्स इंटू एनालिटिकल इंस्ट्रूमेंटेशन फॉर एप्लाईड साइंसिज' विषय पर सात दिवसीय व्यावहारिक प्रशिक्षण कार्यक्रम शुरू किया गया है। सोफिस्टिकेटेड एनालिटिकल इंस्ट्रूमेंटेशन लैबोरेट्री पंजाब विश्वविद्यालय, चंडीगढ़ के सहयोग से यह कार्यक्रम आयोजित किया है। कुलसचिव प्रो. अवनीश वर्मा ने बतौर मुख्यातिथि कार्यक्रम का उद्घाटन किया। डीन रिसर्च प्रो. नीरज दिलबागी ने मुख्य अतिथि, विशिष्ट अतिथि का स्वागत किया। डॉ. संदीप कुमार ने प्रशिक्षण कार्यक्रम के प्रमुख बिंदुओं, इसकी समय सारिणी पर प्रकाश डाला।

सात दिवसीय डीएसटी समर्थित स्तुति प्रशिक्षण कार्यक्रम जारी

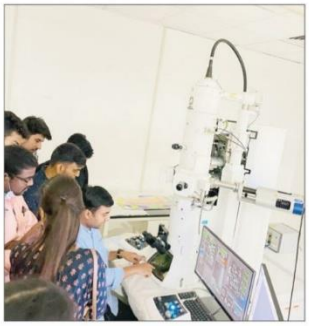
सिटी पल्स न्यूज, हिसार। गुरु जम्भेश्वर विज्ञान एवं प्रौद्योगिकी विश्वविद्यालय, हिसार में सात दिवसीय डीएसटी समर्थित स्तुति प्रशिक्षण कार्यक्रम सुचारू रूप से आगे बढ़ रहा है। गुजविप्रौवि हिसार के डा. संदीप कुमार व पार्क सिस्टम्स के डॉ आशुतोष वलवड़े प्रख्यात वक्ताओं ने कण आकार विश्लेषक और स्कैनिंग जांच माइक्रोस्कोप का उपयोग करके माप विधियों पर व्याख्यान दिया।

वक्ताओं ने प्रतिभागियों के साथ चर्चा की और परिष्कृत उपकरणों का उपयोग करके नैनो कणों, उनके संश्लेषण, अनुप्रयोगों और विश्लेषण के बारे में जानकारी दी। इस स्तुति प्रशिक्षण कार्यक्रम में 19 विभिन्न राज्यों और 30 संस्थानों का प्रतिनिधित्व करने वाले अनुसंधान पृष्ठभूमि के 30 प्रतिभागी भाग ले रहे हैं। दूसरे सत्र के दौरान प्रतिभागियों को पार्टिकल साइज एनालाइजर (डीएलएस), फील्ड एमिशन स्कैनिंग इलेक्ट्रॉन माइक्रोस्कोपी (एफईएसईएम), यूवी स्पेक्ट्रोस्कोपी पर व्यावहारिक प्रशिक्षण दिया गया। प्रतिभागियों ने अपनी प्रतिक्रिया में बताया कि वे इमेजिंग परिणामों से अत्यधिक संतुष्ट हैं। व्यावहारिक प्रशिक्षण के दौरान प्रतिभागियों और विशेषज्ञों के बीच संवाद सत्र का भी आयोजन हुआ। इस सत्र में प्रतिभागियों ने प्रेरित होकर प्रशिक्षण एवं नमूना विश्लेषण के लिए गुजविप्रौवि की आयोजन समिति के प्रयासों की सराहना की।

जीजेयू में सात दिवसीय स्तुति प्रशिक्षण कार्यक्रम आयोजित

हिसार | जीजेयू में एसएआईएफ, पंजाब विश्वविद्यालय, चंडीगढ़ के सहयोग से चल रहे डीएसटी समर्थित सात दिवसीय स्तुति प्रशिक्षण कार्यक्रम चल रहा है। इसमें प्रख्यात वक्ताओं ने उन्नत उपकरण प्रौद्योगिकी, माइक्रोस्कोपी विभिन्न मॉडलों तथा इसके अनुप्रयोगों पर व्याख्यान दिया। जियोल सिस्टम्स, जापान के डॉ. ओइकावा सैन ने प्रतिभागियों को एचआर-टीईएम माइक्रोस्कोपी में वर्तमान प्रगति पर विशेष व्याख्यान दिया। जीजेयू के डॉ. संदीप कुमार ने एसईएम में विभिन्न अनुलग्नकों पर चर्चा पर बल दिया। तीसरे दिन के दूसरे सत्र के दौरान प्रतिभागियों को फील्ड एमिशन स्कैनिंग इलेक्ट्रॉन माइक्रोस्कोपी एफईएसईएम तथा एक्सआरडी विषय पर एक इंटरैक्टिव व्यावहारिक प्रशिक्षण दिया। प्रतिभागियों के नमूनों का विश्लेषण डॉ. एपीजे अब्दुल कलाम सेंट्रल इंस्ट्रूमेंटेशन लेबोरेटरी में फईएसईएम तथा एक्सआरडी उपकरणों का उपयोग कर किया गया।

जीजेयू में दिया गया मास स्पेक्ट्रोस्कोपी और एनएमआर पर इंटरैक्टिव व्यावहारिक प्रशिक्षण



पाठकपक्ष न्यूज

हिसार, 17 मई : गुरु जम्भेश्वर विज्ञान एवं प्रौद्योगिकी विश्वविद्यालय, हिसार (गुजविप्रौवि) में एसएआईएफ, पंजाब विश्वविद्यालय, चंडीगढ़ के सहयोग से चल रहे डीएसटी समर्थित सात दिवसीय स्तुति प्रशिक्षण कार्यक्रम चल रहा है। एससीआईईएक्स, बेंगलुरु के नितिन संजीव ने लक्षण वर्णन के लिए एक आवश्यक उपकरण मास स्पेक्ट्रोस्कोपी पर एक व्याख्यान दिया। ब्रूकर इंडिया साइंटिफिक प्राइवेट लिमिटेड के डॉ. भवानी शंकर जोशी ने एनएमआर, मूल बातें, इंस्ट्रूमेंटेशन, डेटा व्याख्या और अनुप्रयोगों पर वार्ता की। सत्र के दौरान प्रतिभागियों को मास स्पेक्ट्रोस्कोपी और एनएमआर पर इंटरैक्टिव व्यावहारिक प्रशिक्षण दिया गया। सैंट्रल इंस्ट्रूमेंटेशन लैब में प्रशिक्षण के दौरान सामग्री की संरचना की पहचान करने के लिए नमूना तैयार करना, विश्लेषण और परिणामों की व्याख्या की गई। मास स्पेक्ट्रोस्कोपी और एनएमआर पर व्यावहारिक प्रशिक्षण व नमूनों के परिणामों और विश्लेषण से प्रतिभागी संतुष्ट थे। प्रतिभागियों को निकट भविष्य में आयोजित होने वाले स्तुति समर्थित प्रशिक्षण कार्यक्रम में भाग लेने के लिए प्रेरित किया गया। प्रतिभागियों ने इस प्रकार का मंच उपलब्ध करवाने के लिए भारत सरकार के विज्ञान एवं प्रौद्योगिकी विभाग का आभार व्यक्त किया। उन्होंने कहा कि ऐसे कार्यक्रमों में वैज्ञानिक ज्ञान और उच्च स्तरीय उपकरणों के व्यावहारिक प्रशिक्षण को आसानी से प्राप्त किया जा सकता है।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