

**SYNERGISTIC TRAINING PROGRAM UTILIZING THE
SCIENTIFIC AND TECHNOLOGICAL INFRASTRUCTURE**

04th - 11th July, 2022

**"Materials Manufacturing Processes Fundamentals, Testing
and Characterization"**

REGISTRATION FORM

Name : _____

Title : _____

Affiliation : _____

Mailing Address : _____

Pin : _____

Mobile No: _____

Email ID : _____

ELIGIBILITY

- Participant should be an Indian Citizen.
- Assistant/associate professors/Professors/Scientists/Post Doc. Fellows/ Ph.D. Fellow and /or B.Tech. students who are actively involved in the field of basic or allied sciences or engineering.
- Industry professionals who are actively involved in R&D.

REGISTRATION PROCEDURE

- Interested candidates have to fill the online form on or before 17-06-2022 (Link : <https://forms.gle/iEMJ23Ak5upYkg3J6>)
- Candidates will be selected based on eligibility and Availability of seats. The confirmation of selection will be communicated to the selected candidates on or before 23-06-2022 by email.
- Maximum Number of Participants Allowed : 30

GENERAL INFORMATION

- Registration Kit, Course material and Certificate of participation will be provided to the participants.
- Local Hospitality (accommodation & Meal) will be provided. The train fare (as per actuals) by shortest route will be reimbursed to the selected outstation participants. Participants are encouraged to bring their samples if any, for hands on analysis during the program.

All correspondence should be addressed to

Prof. Vasudevan R,
School of Mechanical Engineering, VIT, Vellore - 632014.
Mobile : +91 9500027238
Email : vasudevan.r@vit.ac.in

CHIEF PATRON

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Chancellor, VIT, Vellore.

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VIT, Vellore.

Prof. Raja Annamalai A
Director-CIMR, VIT, Vellore.



**SYNERGISTIC
TRAINING PROGRAM UTILIZING
THE SCIENTIFIC AND TECHNOLOGICAL
INFRASTRUCTURE**

STUTI-2022

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**"Materials Manufacturing Processes -
Fundamentals, Testing and
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Supported by

Department of Science and Technology,
Ministry of Science and Technology, Government of India,
New Delhi.

In collaboration with

Shivaji University, Kolhapur, Maharashtra.

VELLORE INSTITUTE OF TECHNOLOGY (VIT)

Vellore Institute of Technology was founded in 1984 as Vellore Engineering College by the Founder and Chancellor Dr.G.Viswanathan. University status was conferred in 2001 by MHRD Govt. of India in recognition of its excellence in academics, research and extracurricular initiatives.

Ranking & Accreditation

Vellore Institute of Technology (VIT) has emerged as one of the best institutes of India and is aspiring to become a global leader. Quality in teaching-learning, research and innovation makes VIT unique.

- Recognized as Institution of Eminence (IoE) by Government of India.
- Engineering and Technology subject areas of VIT are the 346th best in the World and the 9th best in India as per QS World University Rankings by Subject 2022.
- NAAC Accreditation with A++ grade in the 4th cycle.
- Ranked among the top 900 Universities of the world, one among the Top 10 and the only private institution of India (Shanghai ARWU Ranking 2021).
- The 12th best institution of India in Research and Engineering categories (NIRF Ranking, Govt. of India 2021).
- Ranked within the top 200 in Asia (QS - Asia University Rankings 2022).

SCHOOL OF MECHANICAL ENGINEERING (SMEC)

The School of Mechanical Engineering is amongst the premier schools of VIT functioning right from 1984. The school has five departments with a team of highly qualified faculty members, many holding Ph.D. from the elite institutes across the globe, to teach and train the best minds of this country.

Strengths of Mechanical Engineering at VIT

- Three of the Bachelor's Degree Programme offered by the School, B.Tech. Mechanical Engineering, B.Tech. Mechanical with Specialization in Automotive Engineering, B.Tech. Production Engineering and B.Tech. Mechanical with Specialization in Energy Engineering are accredited by ABET.
- Sophisticated Laboratories - 30+ Labs and 4 Research Centres, DST-FIST sponsored Labs.
- MoUs with Universities abroad & Approval of International PG program through Erasmus+ scheme.
- Significant research funding from International funding agencies such as Erasmus+, DST-UKIERI, Royal Academy of Engineering, Indo-German, Indo-Egypt, BRICS, USIEF.
- Significant research funding from several government agencies such as DST, DRDO, MNRE, CSIR, CVRDE, CPDO, IE, AR&DB, CVRDE, BRNS, ISRO, UGC, NRB, AICTE.

ABOUT STUTI

STUTI stand for Synergistic Training program Utilizing the Scientific and Technological Infrastructure Program funded by the Department of Science & Technology (DST), Government of India. The Scheme is intended to human resource and its capacity building through open access to S & T Infrastructure across the country by organizing training program on DST supported R&D equipment targeting Scientists/Professors/PhDs and PDFs actively involved in research across various institutions in the country.

ABOUT SHIVAJI UNIVERSITY

Shivaji University, established on 18th November, 1962 has 276 affiliated colleges with 40 post-graduate departments. Recently, accredited with NAAC 'A++' grade with CGPA 3.52 in its forth cycle of reaccrreditation 2021. Various science departments of Shivaji University are well equipped with different sophisticated instruments and laboratory infrastructures procured using funds from various funding agencies such as TEQIP I & II, DST-PURSE I & II, DST-FIST I & II, SAIF, UGC-SAP I & II, UGC DRS, MHRD RUSSA Centers for Alternative Medicine, Nanofabrics and VLSI Design, DBT-IPLS, RGSTC, Erasmus Mundus+ (EU projects), MHRD PMMNMTT Centre for Cyber Security & Data Science, DBT-BUILDER etc. STUTI project is sanctioned by DST, New Delhi to SUK worth Rs. 2.25 crore for organizing training programs on various sophisticated instruments.

GOAL OF STUTI PROGRAM

- The participants will comprehend, and get familiarized with the various sophisticated instruments supported by DST, GoI and other funding agencies.
- The participants will gain skill based knowledge and garner practical exposure on various sophisticated instruments and characterization techniques and its analysis.
- The participants get acquainted with the sophisticated instruments and characterization tools that disseminate the competencies to the design and implement the appropriate strategies for research works.

COURSE CONTENTS

The main theme of this training program is to Impart knowledge to the participants regarding various sophisticated instruments and characterization tools such as Morphological Characterization Technique (TEM, HRTEM, and AFM), Compositional Characterization Technique (ICP-OES, GCMS-MS, and XPS), Structural Characterization Technique (XRD, Raman, FTIR, Particle Size Analyzer with Zeta Potential, and TGA-DTA-DSC) and Antenna Testing & Microwave Application (VNA) etc. The training program includes theory lectures as well as Demonstration/Hands on Training on the sophisticated instruments throughout the program.

LECTURE LIST

1. Introduction to advanced materials (Past, Present and Future).
2. Importance of Material science tetrahedron.
3. Emerging trends in powder metallurgy.
4. Advances in casting technology.
5. Recent developments in metal forming technology.
6. Modern trends in joining technology.
7. Current revolution in cutting technology.
8. Introduction to polymer additive manufacturing.
9. Introduction to Metal/alloy Additive Manufacturing.
10. Modern approaches in processing of composites.
11. Importance of material specific manufacturing processes.
12. High temperature material processing.
13. High temperature material characterization techniques.
14. Importance of Microstructural analysis.
15. Advances in characterization techniques.
16. Mechanical behaviour of advanced materials.
17. Characterization of mechanical properties and its importance.
18. Lecture on tribological properties I – Corrosion.
19. Lecture on tribological properties II.
20. Smart materials.
21. Functionally graded materials.
22. Latest advancement in surface modifications.
23. Current trend in coating technology.
24. Recent progress of industry 4.0 in advanced manufacturing processes.
25. Recent development of Industry 4.0 in characterization techniques.
26. Evolution and importance of hybrid education system.

HANDS-ON TRAINING LIST

1. Metallographic steps to do microstructural analysis - Demo.
2. Demonstration of advanced casting and powder metallurgy.
3. Demonstration on wire-cut EDM.
4. Demonstration on FDM and reverse engineering (Scanner).
5. Demonstration on SLM.
6. Demonstration on Creep, and impact testing.
7. Demonstration on FE-SEM and P-XRD.
8. Demonstration on Tensile, Fatigue, compression and Flexural test.
9. Demonstration on wettability, residual stress, and other surface properties.
10. Demonstration on tribological testing.