

ENGINEERING STAFF COLLEGE OF INDIA

Autonomous Organ of The Institution of Engineers (India) (IMS [ISO 9001:2015, ISO 14001:2015, ISO 50001:2018, ISO 45001:2018], ISO/IEC 17025:2017 Certified, AICTE & CEA Recognized Institution) Old Bombay Road, Gachibowli, Hyderabad – 500 032. Telangana, India



Management and Technology Division

Hybrid (Offline & Online) Continuous Professional Development Programme on

Advances in Fusion and Solid State Welding Technologies and Non-Destructive Testing (NDT) Methods Dates: 02 – 06 June 2025 at ESCI Campus, Hyderabad

INTRODUCTION

Worldwide, welding is a multi-billion dollar fabrication technology, used extensively in the construction of building, bridges, manufacturing automobile, aircraft, aerospace applications, power & energy sector, shipbuilding and electronic industries. Defects in welds or poor performance of weld can lead to catastrophic failures with costly consequences including losses to property and life.

Virtually every manufacturing industry uses a welding process at some stage of manufacturing or in repair or maintenance of process equipment like Industrial Boilers and heavy duty welding of steel plates for ship building etc.

Non-destructive Testing is the most versatile tool to assess quality of components and to ensure their reliability in service. The increasing applications of Non-Destructive Testing Methods necessitate that the tests and evaluation of components are conducted by competent personnel ensuring uniformity of practice and soundness of technical approach.

The competence of personnel involved can only be ensured by exposing them to a systematic training in the science and practice of non-destructive evaluation. In view of the multi-disciplined background and varying experience of entrants to the field of NDT, the course has been developed from fundamentals through advanced.

COURSE OBJECTIVE

The objectives of the programme are:

- Impart through knowledge to the engineers and managers on advances that are coming up in the area of welding and its application in various industries
- The objective of the programme is to provide an insight into the various aspects of NDT and to update the knowledge of personnel working with manufacturing and process industries, automobile, defence, aeronautical or aerospace, ordnance factories, public & private sectors enterprises.

COURSE COVERAGE

The issues to be deliberated during the programme are:

- Introduction to Welding Technologies
 - Fundamentals of welding processes
 - Classification: Fusion vs. Solid-State welding
 - Applications across industries (aerospace, automotive, energy, etc.)

Fusion Welding Processes – Advancements

- Gas Tungsten Arc Welding (GTAW / TIG)
- Gas Metal Arc Welding (GMAW / MIG)
- Laser Beam Welding (LBW)
- Plasma Arc Welding (PAW)
- Submerged Arc Welding (SAW)
- Electron Beam Welding (EBW)
- > Solid-State Welding Techniques Developments
 - Friction Stir Welding (FSW)
 - Ultrasonic Welding
 - Diffusion Bonding
 - Explosion Welding
 - Magnetic Pulse Welding (MPW)
 - Materials and Metallurgical Considerations
 - Weldability of advanced materials (Ti alloys, Ni-based super alloys, HSLA steels)
 - Heat-affected zones (HAZ) and grain structure control
 - Residual stresses and distortion
 - Solidification and defect formation mechanisms
- > Quality Assurance and Non-Destructive Testing (NDT)
 - Defect detection in fusion and solid-state welds
 - Techniques: DPT, MPT, Ultrasonic, Radiography, Eddy Current, Visual inspection
 - Standards and certification requirements (ASME, AWS, ISO)

METHODOLOGY

Methodology of the programme includes class room Sessions with Lecture/discussion with audio visual aid, benched marked practices if any, video shows, Chalk & Talk sessions, group discussions, case studies, debates, sharing of experiences, etc. All the sessions will be interactive demanding active participation from all the members. Case Method of Instructions will be the main method of knowledge facilitation.

TARGET PARTICIPANTS

Engineering Executives, Scientists, Technical officers, Technicians from various Defence Labs, Engineering managers, supervisors working in production, welding, R&D units, process planning, designs, maintenance and Quality Control / Quality Assurance in manufacturing and process industries like heavy equipment fabrication sectors, automobile, defence, aeronautical, electronics, power sectors (Generation–Thermal, Nuclear, Gas) medical products & precision instruments, petrochemicals, fertilizers, ordnance factories, public & private sectors enterprises will be highly benefited by attending the programme.

BENEFITS TO THE PARTICIPANTS

- Awareness on the Best Practices and Current Trends in the fields of Welding and NDT discipline.
- Great Exposure and unique opportunity to share experience and learn from large numbers of experts and participants from various organizations and eminent faculties, on different approaches various organizations are following in the field Welding and NDT discipline.
- An understanding of the benefits and drawbacks of each form of non-destructive examination can help participant to choose the best method for his specific application.
- A platform to give an opportunity to receive life time support on welding and NDT aspect even after the programme is over.
- Opportunity to have practical exposure during Technical visit to prestigious establishment.
- Opportunity to present case study in case found suitable.
- Awareness on Certification schemes NDT Levels.

RESOURCE PERSONS

Faculty consists of experts from industry, research establishments and academia besides faculty from ESCI.

PROGRAMME DIRECTOR(S)

Dr. U.S. JYOTHI

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PROGRAMME DATES & TIMINGS

Dates: 02 – 06 June 2025

Timings : On the first day Registration will commence at **09:00 Hrs**. On all other days the programme timings will be from **09:45-17:15 Hrs** with breaks in between for tea and lunch.

<u>COURSE FEE:</u> Rs.27,000/- (Rupees Twenty Seven Thousand only) per Participant + GST@18% Extra. Fee includes, course material, course kit, twin-sharing/single AC accommodation as per availability, breakfast, lunch, dinner, tea / coffee and snacks during the actual days of training programme.

Online: WebEx platform.

Rs. 15,000 /- (Rupees Fifteen Thousand only) per participant + GST@18% Extra. DISCOUNTS

- Non-Residential Fee: 10% discount on course fee is allowed for non-residential participants.
- **Group Discount:** Additional 10% discount for three or more participants if sponsored by the same organization.

Note: GST Nil for Central Govt. Departments (like DRDO, DGQA & Govt. Departments).

PAN Card No AAATT3439Q; GST No. 36AAATT3439Q1ZV. **H.S. No. 999293** (Under commercial training or coaching services – clause 65(105) (ZZC) of Finance act – 1994).

Programme fee is to be paid in in favor of **"THE INSTITUTION OF ENGINEERS (INDIA) – ENGINEERING STAFF COLLEGE OF INDIA"** in the form of demand draft payable at Hyderabad. Alternatively, the payment may be made by Electronic Fund Transfer (EFT) to ESCI - **SB A/c No.0432104000039631 with The IDBI Bank Ltd., Gachibowli Branch, Plot No. 2-53/2, JNIBF, IIIT Junction, Gachibowli, Hyderabad-500032 by RTG's/ NIFT / IFSC Code No: IBKL0000432.** While using EFT method of payment, please ensure to communicate us your company name, our Invoice reference and programme title.

CERTIFICATION

A Certificate of participation will be awarded to each participant on conclusion of the programme.

GENERAL INSTRUCTIONS:

- ESCI encourages participants to present case studies from their respective organizations.
- ESCI provides complimentary accommodation and boarding to the participants one day before commencement (Check-in 1200 h) and one day after conclusion (Check-out 1200 h) of the programme duration. Overstay charges will be applicable as per ESCI rules (subject to availability of accommodation).
- Well-developed Information Centre and Internet facilities are available to the participants free of cost.