



ENGINEERING STAFF COLLEGE OF INDIA (ESCI)

(An ISO 9001:2015 Certified, AICTE & CEA Recognized Institution)

Autonomous Organ of the Institution of Engineers (India)

Old Bombay Road, Gachibowli, Hyderabad – 500 032. Telangana, India



Design Prototyping Centre & Mechanical Division (DPC –MD)



Continuing Professional Development Programme on

Industrial Metallurgy for Non - Metallurgists: Basics, Processes and Applications 28 - 31 July 2026

INTRODUCTION

Metals and alloys are integral to engineering systems across industries such as aerospace, defence, automotive, power, oil & gas, and manufacturing. Engineers from various disciplines often work with metallic materials but may not possess a structured understanding of metallurgical principles that influence material performance, reliability, and failure.

This programme provides a practical introduction to the fundamentals of metallurgy, covering metal structures, properties, heat treatment, material selection, corrosion, and failure analysis. Emphasizing real-world industrial applications, the programme connects metallurgical concepts with design, manufacturing, quality assurance, and maintenance practices. Upon completion, participants will be able to better understand material specifications, evaluate processing and performance requirements, and make informed engineering decisions involving metallic materials.

OBJECTIVES

The objectives of the programme are:

- To provide a fundamental understanding of metallurgical principles, including the structure, properties, classification, and behavior of metals and alloys used in engineering applications.
- To develop working knowledge of key metallurgical and manufacturing processes, such as casting, forging, rolling, welding, and heat treatment, and their influence on material performance.
- To enable participants to identify common failure mechanisms, including fracture, fatigue, corrosion, and wear, and apply basic metallurgical testing and analysis techniques for quality assessment.
- To enhance participants' ability to make informed decisions in material selection, process optimization, and quality control, while facilitating effective collaboration with metallurgy, quality assurance, and R&D teams.

COURSE CONTENT

The following topics will be covered during the training programme:

- Fundamentals of Metallurgy: Structure, classification, properties, and behavior of engineering metals & alloys.
- Ferrous & Non-Ferrous Materials: Steels, cast irons, aluminium, copper, titanium alloys, and superalloys.
- Mechanical Properties, Iron–Carbon Phase Diagram, and Steel Manufacturing Processes.
- Metal Processing Techniques: Casting, forging, rolling, extrusion, drawing, and welding metallurgy.
- Heat Treatment Processes and Their Effect on Material Performance.
- Corrosion, Failure Analysis, and Metallurgical Testing Techniques.
- Non-Destructive Testing (UT, RT, MT, PT), Material Standards, Specifications, and Certifications.
- Advanced Engineering Materials, Material Selection, and Industrial Case Studies from aerospace, defence, automotive, power, and manufacturing sectors.

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METHODOLOGY

Methodology of the programme includes Chalk & Talk sessions /lectures/group discussions/case studies/debates with audio-visual aid, benched marked video shows etc. All the sessions will be interactive demanding active participation from all the member participants.

TARGET PARTICIPANTS

This programme is designed for professionals who regularly work with metals, metal components, and manufacturing processes but do not possess a formal background in metallurgy or materials science. It is particularly beneficial for mechanical, production, quality, welding, maintenance, design, project, and procurement engineers involved in material selection, fabrication, inspection, maintenance, and process optimization across manufacturing, steel, foundry, forging, casting, power, oil & gas, and infrastructure sectors.

CERTIFICATION

A Certificate of participation will be awarded to all the participants after the successful completion of the training programme.

COURSE DIRECTOR

Dr. N V S S Sagar

Faculty

Design Prototyping Center and Mechanical Division

Engineering Staff College of India

Gachibowli, Hyderabad.

Email: dpc@escihyd.org

Contact No.: 040-66304184/86/ 9052291738

PROGRAMME DATES: 28 - 31 July 2026

COURSE FEE: Rs. 24,000/- (Rupees Twenty Four Thousands Only) per Participant + GST@18% Extra.

GST is Nil for all the Government Organizations (if they are exempted)

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.

DISCOUNT:

Additional 10% discount for three or more participants, if sponsored by the same organization. sPAN 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 (DD) payable at Hyderabad. Alternatively, the payment may be made by Electronic Fund Transfer (EFT) to ESCI - SB A/c No. **10007111201** with **State Bank of India**, P.B.B / Khairatabad, Rajbhavan Road, Hyderabad-500004 by RTG's/ NIFT / **IFSC Code No: SBIN0004159**. While using EFT method of payment, please ensure to communicate us your company name, our Invoice reference and programme title.

REGISTRATION:

To register, please send your nominations by providing name, designation, contact address, email address, mobile no, telephone and fax number of the participant along with the details of mode of payment of fee, addressed to: dpc@escihyd.org/mechanical-dpc@escihyd.org. For more details please contact our program officer, **Mr. K. Raghuvveera Reddy, Mobile No: 9849988930**.

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 12:00 h) and one day after conclusion (Check-out 12:00 h) of the programme duration. Overstay charges will be applicable as per ESCI rules (subject to availability of accommodation).

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