CASTING TECHNOLOGY
Level 3 Diploma

The training for tomorrow's foundry technical managers and team leaders

INSTITUTE OF CAST METALS ENGINEERS

EAL

The ICME's two year Diploma course is the only programme specifically designed to develop the technical and practical education of the industry's brightest young technicians into professional engineers.

For Employers

The Diploma will give your young technicians a detailed understanding of the foundry industry, its principles and processes. The Diploma will help your business to develop stronger individuals to become the managers of the future.

For Learners

The Diploma will give you the technical and practical education you need to compete in the foundry industry. You will develop a deeper understanding of all the casting processes and the underlying principles of casting that you will need to develop a career in casting.

Course Content

The course is a blend of tutor led sessions, workshops, tutorials, assessed practical work and co-ordinated self-study through a range of support materials and industry expertise. The focus of the programme is to develop highly relevant and valuable practical skills using leading edge industry expertise and facilities.

Units include Sand Casting, Casting Design, Metallurgical Testing, as well as Casting Processes, Environmental issues and Health & Safety matters, giving a broad technical foundry education.

Working together, the students will also benefit from the strong bonds and links with learners from other foundries and suppliers across the industry that will continue long after the course is completed.

Course Structure

A two year course with 64 day-release study days, the Diploma is delivered over a total of 600 hours of study. Tutor led sessions are run across the country and start in the autumn annually.

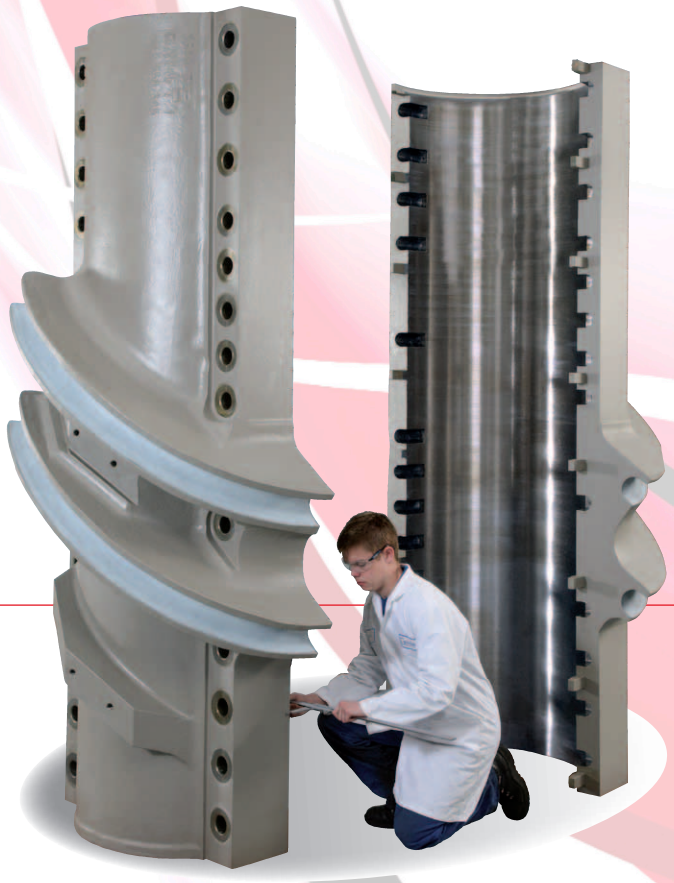
Completion of the qualificationenablesthelear ner to register as an Engineering Technician (EngTech) on the Engineering Council's Register of Professional Engineers and then progress onto higher education programmes. The Diploma can be used towards an Apprenticeship.

Entry Qualifications

All interested candidates with a positive attitude to learning will be considered but generally good GCSEs including Maths, English and Science are required for entry.

Cost

The Diploma costs £5000 for a 2 year programme with a range of payment plans available, and support funding can be sought from Tor Lodge and Applecross Trust, **www.torlodge.org.uk**.



For further information regarding this course please contact:
Call 0121-6016979 **Email** julia@icme.org.uk

www.icme.org.uk

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Casting Technology Diploma Programme - Unit Summary

Mandatory Units 1 to 4
Optional Units 5 to 10 (individuals must pick 4 Optional Units)

1 Engineering and Environmental Health and Safety

- Health and Safety Roles and Responsibilities
- Application of Health & Safety in the Engineering Environment
- Safe Moving and Storing of Materials
- Environmental Management

2 Engineering Organisational Efficiency and Improvement

- Production Activities
- Quality Control and Quality Assurance
- Organisational Improvement Techniques and Competitiveness
- Personnel Rights and Responsibilities within an Organisation

3 Consumable Mould Casting Processes

- Principles and terminology of sand casting
- Moulding principles, processes and techniques
- Chemically bonded sand moulding principles and binding
- Resin shell process
- Vacuum moulding
- Counter gravity pouring and the Cosworth Process
- Investment casting and its development

4 Permanent Mould Casting Processes

- Permanent Mould Casting
- Gravity Die Casting process
- Low Pressure Die Casting
- High Pressure Die Casting Processes and their capabilities
- Squeeze Casting Process and its applications
- Centrifugal Casting methods and their applications
- Ingot production and the basic principles of Continuous Casting

5 Design for Casting

- Initial design considerations
- Basic theory behind the solidification of molten metal
- Casting shape optimisation to reduce defects
- Identify mass concentrations and subsequently modify the design to promote directional solidification
- Manufacturing considerations needed and the importance of inspection feedback
- Casting simulation and analysis software to improve casting design

6 Patternmaking

- Type, preparation and characteristics of patternmaking materials
- Fundamentals of marking out patterns & models
- Type, application and care of patternmaking tools & equipment
- Apply traditional patternmaking construction techniques
- Application and preparation of wood finishing
- Application of moulding resins and plastics
- Basic principles of GRP moulding
- Understand the use of CNC for rapid patternmaking and model production

7 Sand Moulding and Core Making

- Preparation, mixing and hand moulding of greensand
- Preparation, mixing and moulding of chemically bonded sand
- Basic principles of cores, core production and assembly
- Basic principles of feeding
- Basic principles of a running system
- Properties of sand and their associated testing methods

8 Processing and Casting of Molten Metal

- Furnace types and their applications
- Crucibles, ladles and ladle practice
- Refractories and lining construction techniques
- Charging and monitoring of the melting process
- Tapping and the practice of secondary metallurgical treatments
- Foundry practice of casting molten metal

9 Post Cast Operations

- Fettling Hazards and Safety Issues
- 'Knockout Process' and the techniques of core material removal
- Sand Reclamation and Environmental Issues
- Fettling methods and Dressing techniques
- Cast Surface Finishing Operations
- Principles and methods of Heat Treatment
- Casting Repair and Sealing Methodology

10 Metallurgical Testing

- Material properties and material composition analysis
- Mechanical Testing techniques for castings
- Identification and causes of casting defects
- Non destructive testing techniques for casting
- Metallographic examination of castings
- Basic inspection techniques of sample castings
- Casting Inspection by using coordinate measuring machines

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