MAWA EVENTS

Address: No. 857, Block A2. Leisure Commerce Square - No 9., 46150 Petaling Jaya, Selangor, Malaysia

Phone: +601116373203 | **Email:** info@mawaevents.net

STEEL METALLURGY, PRODUCTION AND FABRICATION

"Mastering Steel Processes – From Metallurgical Foundations to Fabrication Techniques"

Schedule

Date	Venue	Fees (Face-to-Face)
03 – 07 Aug 2026	London - UK	USD 3495 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

Introduction

Steel is one of the most widely used materials in the world, serving as the backbone of industries such as construction, automotive, aerospace, and manufacturing. This 5-day intensive course provides a comprehensive understanding of the metallurgy, production, and fabrication processes of steel. Participants will gain in-depth knowledge of the steelmaking process, its various grades and types, and the methods used to fabricate steel products.

By combining theoretical insights with practical applications, this course will enable professionals to better understand material properties, improve manufacturing processes, and troubleshoot common challenges encountered in steel production and fabrication.

Objectives

By the end of this course, participants will be able to:

- Understand the fundamental principles of steel metallurgy and its role in engineering applications
- Describe the steelmaking process from raw materials to finished products
- Identify the different grades of steel and their specific applications
- Learn about heat treatment, alloying, and strengthening methods for steel
- Analyze common fabrication techniques and troubleshoot fabrication issues
- Explore advancements in steel production, including sustainability practices

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Why Attend

- Gain a comprehensive understanding of steel metallurgy from production to fabrication
- Learn about the latest advancements in steel production technologies
- Enhance your ability to select appropriate steel grades for various applications
- Improve quality control and troubleshooting in steel fabrication
- Network with industry professionals and share practical insights into steel processes

Target Audience

This program is designed for:

- Materials engineers, metallurgists, and materials scientists
- Steel production and fabrication professionals
- Quality control and testing engineers
- Designers and engineers working in industries using steel
- Procurement professionals involved in sourcing steel materials

Individual Benefits

Key competencies that will be developed include:

- Understanding the chemistry and physics behind steelmaking
- Proficiency in identifying steel grades and selecting the right material for applications
- Ability to analyze steel fabrication methods and solve manufacturing challenges
- Knowledge of cutting-edge developments in steel production technologies
- Enhanced skillset for quality control, material testing, and failure analysis

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved efficiency in selecting and using steel materials for various applications
- Enhanced capability to troubleshoot and resolve fabrication and production issues
- Reduced waste and improved cost-efficiency in steel production processes
- Enhanced quality control procedures and defect reduction in fabricated steel products
- A better understanding of sustainable and environmentally friendly steel production practices

Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – An overview of steel production, metallurgical properties, and fabrication techniques
- Case Studies – Real-world examples of steel production challenges and solutions
- Workshops – Hands-on exercises in selecting steel grades, fabrication techniques, and quality testing
- Peer Exchange – Group discussions and experience sharing on fabrication and production techniques
- Tools – Practical tools for material selection, quality control, and troubleshooting in steel production

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Course Outline

Detailed 5-Day Course Outline

Training Hours: 7:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Introduction to Steel Metallurgy

- Module 1: Overview of Steelmaking (07:30 – 09:30)
- The history and evolution of steel production
- Raw materials used in steel production (iron ore, coke, scrap, etc.)
- Steelmaking processes: Blast furnace, electric arc furnace, and basic oxygen furnace
- Module 2: Steelmaking Chemistry and Physics (09:45 – 11:15)
- The chemical reactions in steel production
- Control of carbon content and alloying elements
- Thermodynamics and phase diagrams in steelmaking
- Module 3: Steel Grades and Alloying (11:30 – 01:00)
- The classification of steel grades (carbon steels, alloy steels, stainless steels)
- Common alloying elements and their effects on steel properties
- Selecting steel grades for different applications

Day 2: Steel Production Processes

- Module 4: Basic Oxygen Furnace (BOF) and Electric Arc Furnace (EAF) (07:30 – 09:30)
- Operating principles and differences between BOF and EAF
- Key process parameters (temperature, oxygen, fluxes, etc.)
- Advantages and challenges of each method
- Module 5: Secondary Steelmaking and Casting (09:45 – 11:15)
- Ladle refining, vacuum degassing, and alloy additions
- Continuous casting processes and casting defects
- Steel pouring, mold design, and solidification
- Module 6: Heat Treatment of Steel (11:30 – 01:00)
- The role of heat treatment in improving steel properties
- Processes: Annealing, quenching, tempering, normalizing
- The effect of heat treatment on hardness, tensile strength, and ductility

Day 3: Steel Fabrication Techniques

- Module 7: Welding and Joining of Steel (07:30 – 09:30)
- Welding techniques: MIG, TIG, and stick welding
- The challenges in welding high-strength steels
- Inspection and testing of welds (NDT methods)
- Module 8: Forming and Shaping Steel (09:45 – 11:15)
- Hot and cold rolling processes
- Forging, extrusion, and stamping techniques
- Material flow, stresses, and defects during forming
- Module 9: Surface Treatment and Coating of Steel (11:30 – 01:00)
- Galvanizing, powder coating, and other surface treatments
- Corrosion resistance and its impact on performance
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Selection of coatings for different environments

Day 4: Steel Testing, Quality Control, and Failure Analysis

- Module 10: Mechanical Testing of Steel (07:30 – 09:30)
- Tensile, hardness, and impact testing methods
- Microstructure analysis (microscopy and metallography)
- Fatigue and fracture testing for steel
- Module 11: Quality Control in Steel Production (09:45 – 11:15)
- Statistical process control (SPC) in steel manufacturing
- Common defects in steel production and how to address them
- Process audits and root cause analysis
- Module 12: Failure Analysis and Troubleshooting (11:30 – 01:00)
- Common causes of steel failure (fatigue, corrosion, overloading)
- Techniques for identifying failure mechanisms
- Preventive measures and design considerations

Day 5: Advancements in Steel Production and Sustainability

- Module 13: New Technologies in Steelmaking (07:30 – 09:30)
- Innovations in steelmaking: Electric steelmaking, hydrogen-based steel production
- Automation and digitalization in steel production
- The future of advanced high-strength steels
- Module 14: Sustainability in Steel Production (09:45 – 11:15)
- The environmental impact of steelmaking
- Green steel technologies and carbon-neutral production methods
- Recycling and waste management in steel production
- Module 15: The Steel Fabrication Industry and Future Trends (11:30 – 01:00)
- Trends in global steel demand and production
- The impact of Industry 4.0 on steel fabrication
- Preparing for future challenges in steel manufacturing

Certification

Participants will receive a Certificate of Completion in Steel Metallurgy, Production, and Fabrication, demonstrating their comprehensive understanding of steelmaking processes, fabrication techniques, and quality control practices in the industry.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation’s unique goals.

In-House / Customized Training Interested in running this course for your team? Please contact us:	TEL: **+601116373203**	EMAIL: **info@mawaevents.net**