MAWA EVENTS

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

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

METALLURGY FOR THE NON-METALLURGISTS

"Unlock the Secrets of Metals – A Practical Approach to Metallurgy for Non-Experts"

Schedule

Date	Venue	Fees (Face-to-Face)
10 – 14 Aug 2026	London - UK	USD 3495 per delegate

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

Introduction

Metallurgy is a complex science that underpins the creation and processing of metallic materials. While this field is often reserved for specialists, a basic understanding of metallurgy can be crucial for professionals working in industries where metals are integral to the product or process. This 5-day course is specifically designed for non-metallurgists, providing a clear, accessible overview of metallurgical principles and practices.

Through a combination of theory and hands-on learning, participants will gain the fundamental knowledge needed to understand material properties, production techniques, and common issues associated with metals. The course is ideal for engineers, designers, procurement professionals, and anyone whose work involves metals but does not require an in-depth background in metallurgy

Objectives

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

- Understand the basic principles of metallurgy and material science
- Recognize different types of metals and their common uses
- Identify metal properties and how they relate to performance in real-world applications
- Understand the various processes used to shape, treat, and fabricate metals
- Identify common metallurgical failures and how to address them
- Evaluate the impact of different alloying elements on metal performance

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Why Attend

- Gain essential knowledge about metals and their behavior in industrial processes
- Understand how metal properties influence the design and manufacturing of products
- Improve decision-making when working with suppliers or production teams
- Enhance your ability to troubleshoot and resolve issues related to materials in your projects
- Learn from industry experts in a hands-on and interactive learning environment

Target Audience

This program is designed for:

- Engineers, designers, and technical professionals involved in product development
- Quality control, inspection, and testing personnel
- Procurement and sourcing professionals working with metal suppliers
- Project managers overseeing projects that involve metal components
- Any professional who interacts with metallurgical processes but does not have a technical metallurgy background

Individual Benefits

Key competencies that will be developed include:

- A solid understanding of the basic principles of metallurgy
- The ability to assess metal suitability for specific applications
- Enhanced troubleshooting skills when dealing with material-related issues
- Knowledge of heat treatment processes and their impact on material properties
- Familiarity with common metal testing methods and their interpretation

Organizational Benefits

Upon completing the training course, participants will demonstrate:

- The ability to make better material selection decisions for projects and products
- Improved communication between non-metallurgical and metallurgical teams
- A greater understanding of how material properties affect product performance and quality
- Enhanced capacity for preventing and addressing metallurgical failures in production processes
- A more efficient approach to dealing with suppliers and ensuring product specifications are met

Instructional Methodology

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

- Strategy Briefings – Key concepts of metallurgy presented through real-world examples
- Case Studies – Analysis of material failures and successes in various industries
- Workshops – Hands-on activities to help reinforce metallurgical principles
- Peer Exchange – Group discussions on common challenges faced in metal selection, fabrication, and testing
- Tools – Practical tools for material selection, heat treatment processes, and quality control

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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 Metallurgy

- Module 1: Basics of Metallurgy (07:30 – 09:30)
- What is metallurgy and why it is important
- Overview of metallic materials and their properties
- The role of metallurgy in industry and engineering applications
- Module 2: Structure of Metals (09:45 – 11:15)
- Atomic structure and bonding in metals
- Crystallography and the behavior of metals under stress
- Phase diagrams and phase transformations in metals
- Module 3: Classification of Metals (11:30 – 01:00)
- Ferrous and non-ferrous metals
- Alloys vs. pure metals
- Commonly used metals in engineering (steel, aluminum, copper, titanium)

Day 2: Metal Properties and Performance

- Module 4: Mechanical Properties of Metals (07:30 – 09:30)
- Strength, ductility, hardness, and toughness
- How temperature and strain rate affect metal performance
- Stress-strain curves and material testing
- Module 5: Thermal Properties of Metals (09:45 – 11:15)
- Heat capacity, conductivity, and expansion
- Thermal cycling and its effects on metal performance
- Importance of thermal conductivity in engineering applications
- Module 6: Corrosion and Oxidation of Metals (11:30 – 01:00)
- Common corrosion mechanisms (uniform, pitting, galvanic, etc.)
- Corrosion resistance and protection methods
- The role of coatings and surface treatments

Day 3: Metal Processing Techniques

- Module 7: Casting and Molding of Metals (07:30 – 09:30)
- Casting methods (sand casting, die casting, investment casting)
- Advantages and limitations of casting techniques
- Common casting defects and how to avoid them
- Module 8: Metal Forming Techniques (09:45 – 11:15)
- Forging, rolling, extrusion, and stamping processes
- Effects of forming on metal properties
- Challenges in metal forming and how to address them
- Module 9: Welding and Joining of Metals (11:30 – 01:00)
- Different welding processes (MIG, TIG, arc welding)
- The importance of heat treatment and filler materials in welding
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Common welding defects and quality control methods

Day 4: Heat Treatment and Surface Treatment

- Module 10: Heat Treatment Processes (07:30 – 09:30)
- Annealing, quenching, tempering, and normalizing
- How heat treatment affects material properties
- Types of furnaces and heating techniques
- Module 11: Surface Treatments and Coatings (09:45 – 11:15)
- Types of surface treatments (galvanizing, anodizing, powder coating)
- Surface modification for corrosion resistance and wear resistance
- Industrial applications of surface treatments
- Module 12: Non-Destructive Testing of Metals (11:30 – 01:00)
- Common NDT methods: Ultrasonic, radiographic, magnetic particle testing
- The importance of NDT in quality control and failure prevention
- How to interpret NDT results and act on findings

Day 5: Metallurgical Failures and Future Trends

- Module 13: Metallurgical Failures and Their Causes (07:30 – 09:30)
- Common causes of failure: Fatigue, corrosion, stress, and environmental factors
- Failure analysis methods and investigation techniques
- Case studies of real-world metallurgical failures
- Module 14: Innovations in Metallurgy (09:45 – 11:15)
- Emerging technologies in metal production and processing
- Additive manufacturing and 3D printing with metals
- The future of sustainable metallurgy and eco-friendly metal production
- Module 15: Best Practices for Metal Selection and Use (11:30 – 01:00)
- How to choose the right metal for your application
- The importance of material specifications and testing
- Best practices for ensuring quality and longevity in metal products

Certification

Participants will receive a Certificate of Completion in Metallurgy for the Non-Metallurgists, validating their understanding of metallurgical processes, properties, and applications. This certificate will empower them to work confidently with metal-based projects and materials.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
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- **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**

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