

# “Metallurgy for the Non-Metallurgist”

**Dates and Times:**

Four Consecutive Wednesday Evenings  
March 28, April 4, 11, and 18  
Time: 6:00 - 9:00 pm

**Location:**

University of Wisconsin-Milwaukee  
EMS Building (Room TBD)  
3200 N. Cramer St., Milwaukee WI 53211

Metals and alloys are used in the greatest variety of applications of all engineering materials. As such, it is essential for those involved in manufacturing, engineering and construction to have an understanding of what metals are, how they behave, and why they behave differently than ceramics, glass, and plastics. It is also important to understand how they can be made stronger or more corrosion-resistant, how they can be shaped by casting, forging, forming, machining, or welding, and how these processes can alter properties. This course provides this important knowledge to those who are not metallurgists.

**COURSE OUTLINE**

Lesson 1: The History of Metals  
Lesson 2: Extractive Metallurgy  
Lesson 3: Solidification of Metals  
Lesson 4: Metal Forming  
Lesson 5: Mechanical Properties  
Lesson 6: Steels and Cast Irons  
Lesson 7: Heat Treatment  
Lesson 8: Case Hardening of Steel  
Lesson 9: Strengthening Mechanisms  
Lesson 10: Nonferrous Metals  
Lesson 11: Joining  
Lesson 12: Corrosion  
Lesson 13: Quality Control  
Lesson 14: Materials Characterization

**TARGET AUDIENCE**

- Technicians
- Salespeople and managers
- Engineers with no metallurgy background
- Designers
- Employees from forging and casting shops

**3.0 CEUs****ENROLLMENT DEADLINE: TUESDAY, MARCH 27****OPTION 1:****Online:**

Register/pay securely online at  
[asm-milwaukee.org](http://asm-milwaukee.org)

**OPTION 2:****Mail registration and fee to:**

Jim Schwaegler  
ASM Milwaukee Chapter  
12965 Myrtle Avenue  
Brookfield, WI 53005

**For more information:**

Adam Hustad  
Element Materials Technology  
262-901-0539

**Make checks payable to:**

ASM Milwaukee Chapter

**\*\* \$50 DISCOUNT IF YOU REGISTER BY WEDNESDAY MARCH 14! \*\***

**ASM Milwaukee Chapter  
2018 Spring Seminar: Metallurgy for the Non-Metallurgist**

**ENROLLMENT DEADLINE: TUESDAY, MARCH 27**

Name: \_\_\_\_\_ Email: \_\_\_\_\_

Title: \_\_\_\_\_ ASM Member No.: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_ Phone: \_\_\_\_\_

**PRICE**

When this course is taught at Materials Park in Ohio, the price is \$2,600 for non-members and \$2,400 for members. When transportation and hotel expenses are added, the course in Milwaukee is truly a cost-effective choice!

**# ATTENDEES / COSTS**

\$500 – Employees of Sustaining Member Companies # \_\_\_\_\_ X \$500 = \_\_\_\_\_

\$550 – Current ASM members # \_\_\_\_\_ X \$550 = \_\_\_\_\_

\$600 – Non-members # \_\_\_\_\_ X \$600 = \_\_\_\_\_

\$250 – Students/retirees/members between jobs # \_\_\_\_\_ X \$250 = \_\_\_\_\_

**TOTAL # \_\_\_\_\_ COST \$ \_\_\_\_\_**

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**LEARNING OBJECTIVES**

Upon completion of this course, you should be able to:

- Describe how metals behave and why; including why and how they can be formed
- Recognize how metals can be strengthened by alloying, cold-working, and heat treatment
- Determine why metals and alloys are not behaving as expected and can be made to behave as needed
- Choose what metal or alloy to use for specific combinations of properties

**3.0 CEUs**