

Peoria Chapter



# Metallurgy for the Non-Metallurgist

Central IL Chapter



## What You'll Learn:

- How metals are recovered from nature and processed into usable form
- How different metal/alloy systems differ in both physical and mechanical properties
- How phase diagrams help determine how alloys will behave
- Factors that affect selection of the correct material for the job
- Mechanical properties and various testing methods for metals and alloys
- How heat treatment can provide a wide range of properties in steels and other alloys
- An introduction to the mechanism of corrosion, welding, brazing, and soldering

## Who Should Enroll:

- Anyone who needs a working understanding of metals and their applications
- Technical, laboratory, and sales personnel
- Engineers from other disciplines
- Management, administrative and other non-technical support staff

## Class Details:

- Duration: 9/27/11 – 11/15/11, once per week on Tuesday
- Location: MM2 Large Conference Room, Sametime and call-in information will be provided
- Time: 4:30 – 6:30pm (CST)
- Cost: \$500 (Participant is responsible for fee)
- CEU's: 3.2

## To Sign Up:

- Go to the Peoria Chapter ASM-AFS Website
  - <https://www.asm-afs-peoria.org/register.asp>
  - Title: "ASM MEI Metallurgy for the Non-Metallurgist (Fall2011)"
- Register for the class (Note payment of \$500 is required upon registration)
  - Retain confirmation number in case changes to registration are needed
  - Retain receipt for work group reimbursement (if applicable)
- If paying by check, send payment to Laura Ligeski
  - *Interoffice Mail:*
    - Facility Code - 16
    - Mail Drop Code – EPMM7650
    - Dept. – MM2

Check Payable to:  
Peoria Chapter of ASM

## More Info:

- For more information, contact:
  - **Emily Merrick** – ASM/MEI Co-Chair  
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  - **Laura Ligeski** – ASM/MEI Co-Chair  
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**Sign Up Deadline: September 20, 2011**



# Metallurgy for the Non-Metallurgist



## Course Overview:

- Presents a history of metals-providing background on the origins of various metals
- Provides an explanation of physical characteristics of metals, including the reason that metals behave differently than such nonmetals as plastics, wood, glass, etc.
- Metals represent a wide range of densities, conductivity and other physical properties
- Explains how and why different metals are selected for specific environmental purposes including resistance to wear, to corrosion, to heat, to cold, to repeated stress, to impact, etc.
- Describes how much stronger metals can become for various applications by heat treatment
- Describes how mechanical properties are measured including descriptions of testing procedures for tensile, impact, fatigue, etc.
- Describes how metals are alloyed and formed to achieve desired mechanical properties-including comparisons between various forming processes including casting, forging, extrusion, rolling, etc.
- Provides basic data on the heat treatment of carbon and alloy steels and some nonferrous alloys to achieve specific property levels. This includes discussion about how alloy additions affect the heat treatability of steels and other alloy bases.

- Describes other methods of increasing strength by cold working
- Provides information about welding and other joining processes in use today
- Discusses why metals corrode and how metals can become more resistant to corrosion with coatings, alloying, electrical methods, and combinations of these along with a discussion about different stainless steel grades.

## Course Outline:

1. Metals: A History
2. Extractive Metallurgy
3. Solidification of Metals
4. Metal Forming
5. Mechanical Properties and Their Measurement
6. Steels and Cast Irons: Applications and Metallurgy
7. Heat Treatment of Steel
8. Case Hardening of Steel
9. Strengthening Mechanisms
10. Nonferrous Metals
11. Joining
12. Corrosion and Corrosion Prevention
13. Quality Control and Failure Analysis
14. Materials Characterization and the Selection Process

**Sign Up Deadline: September 20, 2011**