



<b>Course Code</b> 8-110	<b>CEUs</b> 0.4 CEUs
<b>Course Length</b> 0.5 Day	

### Course Introduction

This course will provide the learner with a comparison of the commonly cast ferrous and nonferrous alloys. There will be discussions of applications, properties, and criteria for selection of the following alloys: iron, steel, copper aluminum, magnesium, zinc, and super alloys.

### Learning Outcomes

1. Explain why we use alloys
2. Explain the difference between ferrous and non-ferrous alloys
3. List at least three criteria that must be considered when selecting an alloy
4. For each alloy explain the:
  - Classification system and list common alloys
  - Mechanical and physical properties of the alloy
  - Applications and industries that use the alloy

### Lesson Outline

- Module 1: Alloy Basics and Selection
  - Lesson 1 : Common elements
  - Lesson 2 : Ferrous vs. Nonferrous
  - Lesson 3 : Mechanical & physical properties
  - Lesson 4 : Alloy characteristics
- Module 2: Iron
  - Lesson 1 : Classification system and list common alloys
  - Lesson 2 : Mechanical and physical properties
  - Lesson 3 : Applications and industries
- Module 3: Steel
  - Lesson 1 : Classification system and list common alloys
  - Lesson 2 : Mechanical and physical properties
  - Lesson 3 : Applications and industries
- Module 4: Aluminum
  - Lesson 1 : Classification system and list common alloys
  - Lesson 2 : Mechanical and physical properties
  - Lesson 3 : Applications and industries
- Module 5: Cooper
  - Lesson 1 : Classification system and list common alloys
  - Lesson 2 : Mechanical and physical properties
  - Lesson 3 : Applications and industries
- Module 6: Magnesium
  - Lesson 1 : Classification system and list common alloys
  - Lesson 2 : Mechanical and physical properties
  - Lesson 3 : Applications and industries

<ul style="list-style-type: none"> <li>• Module 7: Zinc <ul style="list-style-type: none"> <li>○ Lesson 1 : Classification system and list common alloys</li> <li>○ Lesson 2 : Mechanical and physical properties</li> <li>○ Lesson 3 : Applications and industries</li> </ul> </li> <li>• Module 8: Superalloys <ul style="list-style-type: none"> <li>○ Lesson 1 : Classification system and list common alloys</li> <li>○ Lesson 2 : Mechanical and physical properties</li> <li>○ Lesson 3 : Applications and industries</li> </ul> </li> <li>• Conclusion</li> </ul>
<p><b>Instructional Methods:</b></p> <ul style="list-style-type: none"> <li>• Facilitator led discussion</li> <li>• Group discussion</li> <li>• Q&amp;A</li> </ul>
<p><b>Assessment Methods:</b></p> <ul style="list-style-type: none"> <li>• Instructor-led knowledge checks</li> <li>• Group activities, report back and debrief</li> <li>• Discussion</li> </ul>
<p><b>Course Prerequisites, if any:</b></p> <ul style="list-style-type: none"> <li>• None</li> </ul>
<p><b>Attendee Requirements to Earn CEUs:</b></p> <ol style="list-style-type: none"> <li>1. Present at least 3 hours of the total 3.5 hours of instructional time (90%), which does not include meals or breaks.</li> <li>2. Active participation (can include asking questions, communicating with other attendees during and taking part in group activities, providing responses during whole class or group discussions).</li> <li>3. Successful achievement of learning outcomes.</li> </ol>
<p><b>Who Should Attend?</b>  The target audience for this course consists of individuals responsible for:</p> <ul style="list-style-type: none"> <li>• designing/engineering cast components</li> <li>• buying from casting suppliers</li> </ul>