

# Course Syllabus

## Steel Melting 201



<b>Course Code</b> 3-220	<b>CEUs</b> 1.1 CEUs
<b>Course Length</b> (Instructional Time only) 11 hours	

### Course Introduction

Steel Melting 201 will cover the operations of steel melting furnaces including electric arc and induction; the process steps of charging and startup, melt down, chemistry slag control, alloying, tapping, and process documentation; post melt processing methods AOD and VOD; melt quality control of undesirable elements with sampling and chemistry measurements; ladle selection and considerations; maintenance and safety procedures.

### Learning Outcomes

At the end of this course, participants should be able to:

1. Explain the difference between steel melting processes
2. List melt-stock components
3. Explain alloying techniques
4. Explain chemistry measurement techniques
5. Explain post-furnace processing variables
6. Describe the quality implications from melting variables
7. Explain proper refractory selection
8. Describe selection of ladle options (pros and cons)
9. Describe the safety procedures and equipment related to the melting process

### Lesson Outline

Module 1: Introduction

- Introduction Lesson

Module 2: Steel Casting Basics Review

Module 3: Steel Melting Process Introduction

Module 4: Electric Arc Furnace Melting

Module 5: Induction Furnace Melting

Module 6: Post Melt Processing

Module 7: Quality of Melt

Module 8: Ladle selection

Module 9: Maintenance, Safety Procedures and Equipment

Conclusion

### Instructional Methods:

- Presentations
- Facilitator-led discussions
- Individual activities
- Small and large-group activities

### Assessment Methods:

- Informal knowledge checks
- Q&A sessions
- Group activity review

### Course Prerequisites:

Steel 101
<b>Pre-course Activities, if any:</b> None
<b>Texts, Books or other Resources:</b> None
<b>Attendee Requirements to Earn CEUs:</b> <ol style="list-style-type: none"> <li>1. Present at least 10 hours of the total 11 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>
<b>Who Should Attend?</b> <ul style="list-style-type: none"> <li>• Melting operators/supervisors</li> <li>• Metalcasting facility production and management</li> <li>• Process control</li> <li>• Quality assurance</li> <li>• Production and/or sales of supplies and services to the industry</li> <li>• Environmental engineers</li> <li>• Equipment designers</li> <li>• New employees or anyone new to steel melting</li> </ul>