# Course Syllabus

# Coldbox Process 201

| Course Code | CEUs |
|---|---|
| 2-230 | 0.9 CEUs |

**Course Introduction**

This course is the second course in the coldbox coremaking series, and provides the next level of knowledge in relation to the molding processed using within a foundry to make coldbox cores. Discussion will include coldbox terminology and a review of the coldbox process for coremaking, common sands, additives and coatings used, coldbox binders and in particular PUCB, a look at core box equipment, core box tooling and best usage parameters, and considerations when troubleshooting and optimizing the process for proper quality assurance.

**Learning Outcomes**

1. Summarize the coldbox coremaking process.
2. Compare differences in properties of coldbox binder systems.
3. Evaluate raw material and equipment options for coldbox core making.
4. Identify the best core box tooling variation for the catalyst type in use.
5. Explain common core box tooling challenges and how to adjust a process to improve the outcome.
6. Describe ways to optimize the core production processes
7. Describe the important safety measures and operating practices to use with coldbox binders and equipment.

**Lesson Outline**

Module 1: Getting Started

Module 2: The Coldbox Process in Review

- Lesson 1: Coldbox terminology
- Lesson 2: Review of the coldbox coremaking process

Module 3: Sand, Sand Additives, and Coatings Used in the Coldbox Process

- Lesson 1: Sand characteristics and variables
- Lesson 2: Specialty sands used in the coldbox coremaking processes
- Lesson 3: Refractory coatings and additives for coldbox
- Lesson 4: Sand transport and storage

Module 4: Coldbox Binders

- Lesson 1: PUCB and other binders for coldbox
- Lesson 2: Functions of binders and activators
- Lesson 3: Material selection
- Lesson 4: Safety precautions

Module 5: Equipment

- Lesson 1: Types of mixers
- Lesson 2: Core box orientation and blowing equipment
- Lesson 3: Types of generators
- Lesson 4: Avoiding injuries

Module 6: Coldbox Tooling

- Lesson 1: Types of core boxes
- Lesson 2: Core box tool rigging
- Lesson 3: Venting

Module 7: Troubleshooting and Quality Assurance

Lesson 1: Types of Defects: It's Not All There or It's Broken!

Lesson 2: Core box process optimization

**Instructional Methods:**

- Group activities
- Problem solving exercises (comparisons, calculations using spreadsheet)
- Mini examples and case studies
- Games
- Worksheet completion
- Video viewing
- Hands on practice
- Story sharing and discussion

**Assessment Methods:**

No formal assessment will take place in this course; however, attendees will participate in informal activities such as knowledge check and Q&A sessions with the facilitator to verify that learning outcomes are being met. Assessment of successful achievement of learning outcomes must be included throughout the course in order to meet the ANSI/IACET 1-2013 standard for continuing education programs and for CEUs to be awarded.

**Course Prerequisites**

Recommended:

- *Coldbox Coremaking 101* (Institute Course)

**Attendee Requirements to Earn CEUs:**

1. Present at least 8 hours of the 9 hours of instructional time (90%), which does not include meals or breaks.
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).
3. Successful achievement of learning outcomes.

**Who Should Attend?**

The target audience consists of people in the following positions:

- Coldbox coremakers
- Foundry foreman or lead persons
- Sand lab technicians
- Maintenance personnel
- Tooling engineers
- Tooling supervisors
- Core room supervisors
- Process engineers
- Technical managers
- Technical service engineers
- Quality engineers
- Quality supervisors
- Materials engineers