

Online Training

IRON & STEEL CASTING COURSE

“Practical knowledge to use in your company”

Vision

The iron and steel foundry continues to develop technologically, with the manufacture of new qualities and shapes, and high levels of productivity and cost efficiency, fundamental aspects for foundries.

The contents of this course offer a good balance between scientific and technological knowledge, and how this knowledge is transferred in its real and practical implementation in a foundry (induction furnace, electric arc furnace + ladle or cupola refining, and others), and mold casting, showing practical cases. In this way, participants will take with them technical criteria and knowledge that they can check and use in their factories, both to understand the processes and the sequential structure of the foundry, and to act effectively in practice. This course provides attendees with tools to address, identify, understand and overcome the activities, functions and problems that arise in the industrial activity of a foundry, in its different areas or facilities.

This course can benefit any company in the foundry sector, or/and anyone who wants to know how iron and steel foundries are made. Practical knowledge, based on technical and technological principles that can be used to improve productivity, costs, maintenance, quality, and provide tools to address situations, understand them and make decisions in a foundry.

Training Objectives

In the first place, and in order to obtain a vision of the sector and its socioeconomic environment, and of the type of industrial installations, an exhibition of the state of the foundry sector is made as part of the Iron and Steel sector, on a global basis, in terms of

market and production, to understand the strategic and evolutionary vision of the same and of the companies that comprise it. With this, the participant will acquire a vision of the sector in its most important technical, industrial and business lines.

Next, the metallurgical vision of the steps followed in the foundry is addressed, through the methods of melting the raw materials used, basically the types of furnaces (cupola, IF induction and EAF electric arc, rotary and others) and the process characteristics that determine these installations. The raw materials, facilities and equipment used are analyzed. At the end of these modules, the participant will know the fundamentals and the techniques used in the different ovens and containers that are used, appreciating the possibilities and limits of the different techniques.

The last module focuses on the process and techniques of casting iron in the different types of mould, as well as the techniques and design characteristics of the different types of models or patterns. This module will allow the participant to make relevant decisions about the way of casting, the type of crucible or spoon used, the type of molds and their design, in addition to assessing the resulting quality. In addition, this last module is complemented by a chapter on named Foundry 4.0 as part of the Industry 4.0 concept.

Style and Learning

This course is conceived in a practical way, based on the knowledge and technology of the iron foundry, because the content and technical material is explained using a certain visualization in the exposition of the concepts, which the student can identify in his professional environment, or environment of your company, and provoking and accepting any discussion or questions that may arise from the students through the forums and platform messaging, promoting addressing all the contents in an interactive study dynamic.

Online Learning – e-Learning

This type of course is called Online Training, and it includes content for 24/7 online training on our platform, platform messaging for any communication and questions, as well as any tutorial session can be asked to develop in a virtual classroom or videoconferencing.

Online Platform

<https://aula.atecid.com>

Recommendations for the course

The following recommendations seek that the participant can advance through the course continuously, taking advantage of its contents and transforming said contents into their knowledge:

- Try to enter the course daily.
- Try not to accumulate matter for the last days.
- try to dedicate a certain time each day or each week
- participate in forums
- raise your doubts or questions so that the tutor can identify the content to which the student refers
- make sure you do all the assessment exercises

Monitoring and tutorials

During the expected duration of the course, you will have a tutor to answer your questions or concerns, for which it is necessary to use the platform's messaging system.

A tutorial could be asked, and in such case a webinar type videoconference will be held.

The teacher in charge of this course is Javier Aseguinolaza Iriondo, whose qualifications and experience can be checked in [his LinkedIn profile](#).

ANEX. CONTENTS

Module 1: Vision of the Foundry

- Sector vision
- Global vision of a foundry
- Energy-environmental vision
- Types of foundries (iron and steel)

Module 2: EAF

- Introduction to foundry at EAF
- Foundry Chemistry at EAF
- Electrodes and Refractories
- Chemical composition and alloying elements
- Foundry phases in EAF
- EAF parties and operations
- The use of DRI in an EAF
- Dephosphorization and Desulfurization
- Energy balances, productivity and quality

Module 3: Ladle Refining

- Ladle refining process and operations
- Slag control
- Deoxidation and addition of alloying agents
- Other additions and control of inclusions
- Gas control and decarburization
- Homogenization and temperature control
- Refractories
- Productivity and quality

Module 4: Foundry in Induction Furnace, and rotary furnaces

- Characteristics of the induction furnace
- The melting process in an induction furnace
- Chemistry in the induction furnace

Module 5: The Cupola Furnace and Other Furnaces

- Characteristics of the furnace and the process in
- Chemistry and DRI in cupola furnace
- Productivity and Efficiency

- Crucible furnaces

Module 5: Casting in Molds

- Planning and foundry processes
- Casting processes and mold types
- Molds and model building
 - o sand casting
 - o Wax casting and lost foam
 - o Plaster and metal molds
 - o Shell Molding
- In-mold die-casting process
- Die casting molds
- Centrifugal casting and combinations
- Alloys and treatments
- FOUNDRY 4.0