



## KURSPLAN

# Smält metalls processteknik - Järnlegeringar, 3 högskolepoäng

*Liquid Metal Processing – Ferrous Alloys, 3 credits*

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<b>Kurskod:</b>	TJLS22	<b>Utbildningsnivå:</b>	Avancerad nivå
<b>Fastställd av:</b>	VD 2022-03-01	<b>Utbildningsområde:</b>	Tekniska området
<b>Gäller fr.o.m.:</b>	2022-08-01	<b>Ämnesgrupp:</b>	MA2
<b>Version:</b>	1	<b>Fördjupning:</b>	A1N
		<b>Huvudområde:</b>	Produktutveckling

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### Lärandemål

After a successful course, the student shall

Kunskap och förståelse

- show familiarity with different methods of melting and casting steel and cast iron
- show familiarity with the industrial practice for the treatments of the ferrous alloys melts
- display knowledge of how to prepare a charge material for casting

Färdighet och förmåga

- demonstrate skills of understanding the data from a cooling curve

Värderingsförmåga och förhållningssätt

- demonstrate an understanding of how to add alloying at the preparation of a cast iron alloy

### Innehåll

The course is designed to familiarize students with theoretical/practical contexts for the manufacture of iron and steel castings, the important characteristics of iron-based alloy casting. The students will get familiar with different methods of melting and casting steel and cast iron. The course is also focusing on the quality control methods.

The course includes the following elements:

- Fundamentals of Ferrous Metallurgy.
- Melting technology of Cast Iron. (Melting furnaces, melting methods, charge optimization,)
- Liquid treatment and Ladle metallurgy. (Alloying, desulfurization, inoculation, modification.)
- Quality control of the liquid iron. (Chemical analyses, dissolved gas analyses, test of fluidity, cooling curve and volume change analyses).
- Quality control by characterization of cast iron. (Wedge tests, characterization of cast iron by morphology)
- Elaboration of steel for shape casting. (Melting, charge, de-oxidation and other treatments, control methods)

### Undervisningsformer

The course lectures, assignments, laboration and meetings are given entirely online.

Undervisningen bedrivs på engelska.

### **Förkunskapskrav**

Passed courses at least 90 credits within the major subject in Mechanical Engineering, and 15 credits Mathematics and Component Casting, 6 credits, proof of English proficiency is required (or the equivalent)

### **Examination och betyg**

Kursen bedöms med betygen 5, 4, 3 eller Underkänd.

The final grade for the course is based upon a balanced set of assessments. The final grade will only be issued after satisfactory completion of all assessments.

Poängregistrering av examinationen för kursen sker enligt följande system:

Examinationsmoment	Omfattning	Betyg
Examination	3 hp	5/4/3/U

### **Kurslitteratur**

Litteratur

The literature list for the course will be provided 8 weeks before the course starts.