



## COURSE SYLLABUS

# Moulding Materials in Foundry Technology, 3 credits

*Formmaterial i gjuteriteknik, 3 högskolepoäng*

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<b>Course Code:</b> TFGS26	<b>Education Cycle:</b> Second-cycle level
<b>Confirmed by:</b> Dean Mar 1, 2016	<b>Disciplinary domain:</b> Technology (95%) and social sciences (5%)
<b>Valid From:</b> Aug 1, 2016	<b>Subject group:</b> MA2
<b>Version:</b> 1	<b>Specialised in:</b> A1F
<b>Reg number:</b> JTH 2016/1129-313	<b>Main field of study:</b> Product Development

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- show familiarity with the complete range of different moulding materials used in foundry technology, including the various types of aggregates as refractory, inorganic and organic binder systems, coatings, additives, tools, etc.
- display understanding of the most important mould and core making methods used in the foundries.

Skills and abilities

- demonstrate skills of performing the significant quality control measurements of moulding aggregates and moulding mixtures.
- demonstrate the ability to evaluate these measurements and to produce relevant information for the casting manufacturing process.

Judgement and approach

- demonstrate the ability to choose the suitable type of moulding material/mould or core making method necessary for the manufacturing of different types of castings.

### Contents

This course provides a general overview of different moulding materials, mould/core making methods and quality control measurements. The main aim of the course is to enhance the knowledge by giving explanations to the mould and core making processes commonly employed.

The course includes the following topics

- Introduction to Moulding Materials
- Moulding Aggregates, Measurements of Sand Properties
- Chemically Bonded Systems: Cold and Thermosetting Processes, Quality Control
- Fundamentals of Green Sand Moulding, Quality Control
- Moulding and Core making Methods, Reclamation

## Type of instruction

Lectures, entry assignment, weekly quizzes, discussion forums, laboratory exercises.

The teaching is conducted in English.

## Prerequisites

Passed courses at least 90 credits within the major subject in Mechanical Engineering, and 21 credits Mathematics and Component Casting, 6 credits, and Melting and Casting of Ferrous Alloys, 3 credits. English Language requirements corresponding to English 6 or English B in the Swedish upper secondary school (or the equivalent).

## Examination and grades

The course is graded 5,4,3 or Fail.

Registration of examination:

Name of the Test	Value	Grading
Examination <sup>1</sup>	2 credits	5/4/3/U
Laboratory Exercises	1 credit	U/G

<sup>1</sup> Determines the final grade of the course, which is issued only when all course units have been passed.

## Other information

Laboratory exercises are designed to cover a wide variety of the lecture materials, and also the individual topics. Evaluation of laboratory exercises are graded with Pass (G) or Fail (U). Passing all of the labs are mandatory to complete the course. Labs 1-2 will be online and labs 3-4 will cover 1 day on campus.

## Course literature

The literature list for the course will be provided one month before the course starts.

### Mandatory literature:

ASM Metals Handbook Volume 15, on-line available via the University Library  
 J.R. Brown - Foseco Ferrous and Non-ferrous Foundryman's Handbook  
 Lecture slides and additional literature provided in PingPong.

### Reference literature:

Chemically Bonded Cores and Moulds - An Operator's Manual for the use of chemically bonded, self-setting sand mixtures - American Foundry Society  
 Principles of Sand Control - American Foundry Society  
 C.W. Ammen - The Complete Handbook of Sand Casting  
 J. Campbell - Complete Casting Handbook, 1st edition, Chapter 4, 15.