



COURSE SYLLABUS **Cast Design and Calculation, 3 credits**

Gjutdesign och kalkylering, 3 högskolepoäng

Course Code: TGKS26	Education Cycle: Second-cycle level
Confirmed by: Dean Mar 1, 2016	Disciplinary domain: Technology (95%) and social sciences (5%)
Revised by: Director of Education Oct 28, 2021	Subject group: MA2
Valid From: Jan 1, 2022	Specialised in: A1F
Version: 2	Main field of study: Product Development

Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- demonstrate comprehension of factors that control the economic and environmental cost of castings
- display knowledge of how a casting should be designed to enable cost and material efficient manufacturing
- show familiarity with advanced product development methods as Finite Element Analyses and Topology optimization

Skills and abilities

- demonstrate the ability to apply basic and advanced methods for design and manufacturing of castings with a low economic and environmental cost

Judgement and approach

- demonstrate an understanding of important factors that affects the economic cost and the environmental impact of a casting and a foundry

Contents

The course aims to provide knowledge about how to design castings and casting processes in order to provide optimal functionality at a low economical cost and environmental impact. The students will learn about drivers for economic cost and environmental impact in a casting and in a foundry. Design and product development methods are introduced, both basic methods and advanced computer based simulation methods as Finite Element Analyses and Topology Optimization.

The course includes the following topics:

- Drivers of economic and environmental cost in a casting and in a foundry
- Basic design rules and casting process simulations
- Product development and simulation methods

- Advanced product development and structural optimization methods

Type of instruction

The teachings consists of lectures and assignments.

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, Manufacturing Technology, 9 credits, and Failure Analysis, 6 credits, and 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.

The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Examination	3 credits	5/4/3/U

Course literature

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

Recommended literature:

“Design of Experiments: Principles and Applications” by L. Eriksson.