JÖNKÖPING UNIVERSITY
School of Engineering

COURSE SYLLABUS

Science of Remelting, Aluminum Alloys, 2.5 credits

Vetenskapen om omsmältning av aluminiumlegeringar, 2.5 högskolepoäng

Course Code:	TALR25	Education Cycle:	Second-cycle level
Confirmed:	Feb 01, 2025	Disciplinary domain:	Technology
Valid From:	Sep 01, 2025	Subject group:	Materials Technology
		Specialised in:	A1N Second cycle, has only first-cycle course/s as entry requirements
		Main field of study:	Product Development

Intended Learning Outcomes (ILO)

On completion of the course the student shall:

Knowledge and understanding

- display knowledge of the common impurities and tramp elements in aluminium alloys and their impact on the final component.
- demonstrate comprehension of the industrial practice for the treatments of aluminium melts.

Skills and abilities

- demonstrate the ability to select a suitable treatment process for a specific aluminium alloy and casting process using thermodynamics and kinetics for the intended reactions and process steps.

Judgment and approach

- demonstrate the ability to predict the required additional amounts and treatment times for the intended and judge if the process outcome had the intended effect.

Content

Low carbon footprint and resource efficiency requires energy and materials efficient recycling and use of recycled circular materials such as aluminium. The critical content is related to the aluminium alloy preparation including, light metal scrap remelting technologies, melt refining and impurity control to enable sustainable management of circular materials. Practices for microstructural engineering such as grain refinement and microstructural modification.

The course includes the following elements:

- Fundamentals of aluminium metallurgy
- Melting, furnaces and handling equipment
- Physics of melting and handling
- Cleaning practices
- Liquid metal treatments practice
- Mechanical melt treatments
- Melt quality consequences

Type of instruction

Lectures, assignments, and discussion forums.

Language of instruction is in English.

Entry requirements

Academic degree of at least 180 ECTS credits within Engineering and/or Technology or Passed courses of at least 40 credits in the main field of study within Engineering and/or Technology and at least 1 year of work experience in the manufacturing industry or At least 4 years of work experience in the manufacturing industry. Proof of English proficiency is required.

Examination and grades

The course is graded Pass (G) or Fail (U).

The final grade will be issued after satisfactory completion of all mandatory examination elements.

Registration of examination:

Name of the Test	Value	Grading
Assignment	2.5 credits	G/U

Course literature

Please note that changes may be made to the reading list up until eight weeks before the start of the course.

LIQUID METAL PROCESSING Non-Ferrous Metals for Component Casting
Anders E.W. Jarfors