JÖNKÖPING UNIVERSITY
School of Engineering

COURSE SYLLABUS

# Sustainable Product Realisation, 7.5 credits

*Hållbar Produktframtagning, 7.5 högskolepoäng*

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|---|---|---|---|
| Course Code: | THFS25 | Education Cycle: | Second-cycle level |
| Confirmed: | Feb 01, 2025 | Disciplinary domain: | Technology |
| Revised: | Sep 29, 2025 | Subject group: | Materials Technology |
| Valid From: | Jan 19, 2026 | Specialised in: | A1F Second cycle, has second-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 sustainability in the operation of manufacturing processes.
- display knowledge on product life cycles and their relations to engineering materials and manufacturing processes.

## Skills and abilities

- demonstrate the ability to design and evaluate products and systems for life-cycle sustainability and circularity.
- demonstrate the ability to make systematic material and manufacturing process choices for designs considering all requirements, including the user experience.
- demonstrate the ability to design and build product conceptual models to visualize how materials and manufacturing processes impact the final product in terms of performance, sustainability, and user experience.

## Judgement and approach

- demonstrate the ability to design new products and improve existing ones to increase sustainability and circularity in product life cycles, supported by physical models and prototypes in practical evaluations
- demonstrate an ability to adopt a multidisciplinary holistic approach to product realization, understanding how all parts of the value chain contribute to the sustainability and circularity of the product.

## Content

In this course, students will engage in hands-on projects applying sustainability and circularity strategies to product development challenges. Students will design and build product concepts, using materials and manufacturing process that highlight the trade-offs between sustainability, manufacturability, and user experience. By the end of the course, students will have developed both theoretical knowledge and practical experience in creating sustainable products.

The course includes the following elements:

- Engineering materials and their properties
- The relationship between materials, manufacturing, product design, and user experience
- Energy- and resource-efficient manufacturing processes, including for example casting, additive manufacturing, and welding

- Concept development and prototyping for showcasing product lifecycles
- Sustainability assessment tools such as Life Cycle Assessment (LCA)
- Balancing sustainability with other design requirements in a holistic approach
- Life cycle costing analysis

## Type of instruction

The course contains lectures, exercises, and supervised project work.

Language of instruction is English.

## Entry requirements

Passed courses of at least 150 credits in the program Industrial Product Realisation, or passed courses of at least 90 credits in Materials, Mechanical, Chemical, Manufacturing, Industrial, Production, Civil, or Construction Engineering, Materials and Manufacturing, Product Development, Engineering Physics, Innovation, Industrial Design or the equivalent. The bachelor's degree should comprise a minimum of 15 credits in Mathematics. Taken course Materials and Process Selection for Product Design, 7,5 credits, or the equivalent. Proof of English proficiency is required.

## Examination and grades

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

The final grade U/3/4/5 is given after all examinations are completed.

Registration of examination:

| Name of the Test | Value | Grading |
|---|---|---|
| Project | 5 credits | 5/4/3/U |
| Assignment [1] | 2.5 credits | G/U |

[1] Individual

## Course literature

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