Reg No: MSAD21/20252

Faculty of Health, Science and Technology
Mechanical Engineering

Syllabus

Sustainable Product Development

Course Code:	MSAD21
Course Title:	Sustainable Product Development *Hållbar produkt- och affärsutveckling*
Credits:	15
Degree Level:	Master's level
Progressive Specialisation:	Second cycle, has second-cycle course/s as entry requirements (A1F)

Major Field of Study:
IEA (Industrial Management)
MTA (Mechanical Engineering)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2025-02-26, and is valid from the Autumn semester 2025 at Karlstad University.

Prerequisites
45 ECTS credits completed in the Master programme in Innovation and Service Development, or 180 ECTS credits completed in the Master programme in Industrial Engineering and Management, with 22.5 ECTS credits at the second-cycle level, plus upper secondary level Swedish 3 or Swedish as a second language 3, and English 6, or equivalent

Learning Outcomes
The main aim of the course is for students to acquire knowledge of and the ability to reflect upon industrial product development, including a holistic approach to the product development process. There is a special focus on the concept of sustainable development in relation to product and business development.

Upon completion of the course, students should be able to:

The project development process and the project team (2 ECTS cr)
- give an account of the product development process from need to abolition,
- give an account of and reflect upon the different roles in a project team and how they cooperate,
- give an account of the concepts of gender, ethics, and code of conduct in the context of a project team, and
- give an account of selected examples of current research in the area.

Product development project (7 ECTS cr)
- use structured methods and tools for planning, organising, and executing a product development project in groups,
- present results in a clear manner to a client, orally and in writing, and argue for their chosen solutions,
- give an account of and reflect upon a coherent product development process, including aspects of technology, organisation, and business,
- analyse group dynamics in the work of the project team in relation to theory, and
- reflect upon the business aspects of a product development project from a sustainability perspective.

Sustainable development (3 ECTS cr)
- give an account of and reflect upon the role of the engineer in relation to the concept of sustainable development from a product perspective,
- give an account of the concept of sustainable development in relation to different definitions and ecological, social, and economic dimensions,
- give an account of a few established principles for sustainable development,
- explain the problem of resources in relation to definitions, access, and distribution, and
- give an account of selected examples of current research in the area.

Business development (3 ECTS cr)
- give an account of and analyse the connection between technical and business-related aspects in a product or process development project,
- use and apply relevant models for analysing the business benefits of a new or improved product or process,
- identify and communicate business case and related strategies to various stakeholders, and
- reflect upon a sustainable approach to business development in relation to product development and innovation.

Content
The course includes techniques, methods, procedures, and organisation for increased efficiency and learning in product development, with a focus on innovation and sustainability issues in general and in sustainable business development in particular.

The course combines a theory component which includes lectures, exercises, and mandatory seminars on product development, the project team, sustainable development, and business development, and a practical case project which is reality-based, associated with a company, and completed in groups.

Reading List
See separate document.

Examination

Assessment is based on:
The project development process and the project team: A written test, a mandatory seminar, and an individual hand-in assignment
Product development project: Mandatory supervision sessions, hand-in assignments, an oral presentation, a project report, and an individual reflection report
Sustainable development: A written exam, a mandatory hand-in assignment, and seminars
Business development: An individual hand-in assignment and an oral presentation

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course.

Quality Assurance
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate
A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.