DALARNA UNIVERSITY

Course Syllabus

The role of Materials in the Production Chain 7.5 Credits, First Cycle

Learning Outcomes

Knowledge and understanding
Upon completion of the course, students will be able to:

- explain the central material engineering concepts in the production chain,
- describe the most common construction and tool materials used in forming and machining processing,
- explain the concepts of formability and machinability,
- describe the most common methods for material and surface characterisation linked to various processing techniques,
- describe the interaction between work material and tools and its impact on tool wear and the machined product's surface quality, surface integrity, surface damage and surface topography.

Skills and abilities
Upon completion of the course, students will be able to:

- assess the formability / machinability of different work materials for a given production technological process,
- analyse the outcome of a selected production process and selected process parameters on the manufactured product's (surface) quality.

Evaluation ability and approach
Upon completion of the course, students will be able to:

- discuss and reflect, in a critical manner, on how the formability and machinability of a work material are affected by the selected production process and selected process parameters,
- based on an environmental and ethical value base, discuss and reflect on suitable material choices.

Course Content

The course focuses on the role of the material (material behaviour) in connection with the most common processing methods in a production chain and how this parameter affects the possibilities and limitations of the processing method as well as the obtained quality of the product. Important concepts covered are as follows: formability,

machinability, surface quality, surface integrity, surface damage, surface topography, environmental impact and sustainability.

Assessment

- Written examination
- Laboratory sessions

Grades

The grading scale used for the final course grade is U, 3, 4, 5.

Grades are reported as follows:

- Written exam - 5 Credits | U, 3, 4, 5
- Machining related surface failures - 1.5 Credits | U–G
- Tool wear - 1 Credit | U–G

Prerequisites

General entry requirements

Other Information

This course cannot be counted towards the same degree along with courses that have equivalent content.

If the student has received a decision/recommendation granting study support from Dalarna University because of a disability, then the examiner has the right to offer an alternative examination arrangement. The examiner takes into account the objectives in the course syllabus when deciding whether the examination can be adapted in accordance with the decision/recommendation.

Subject:

Mechanical Engineering

This course can be included in the following main field(s) of study:

1. No main field of study

Progression Indicator:

1. GXX

Approved:

Approved 4 April 2023
Valid from 4 April 2023