UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

COURSE SYLLABUS

Advanced Computer-Aided Manufacturing A1N

6 credits

Course code: VP776A
Version number: 1
Valid from: 1 January 2026
Ratified by: Curriculum Committee for Engineering Science
Date of ratification: 22 May 2025

1. General information about the course

The course is provided by the University of Skövde and is named Advanced Computer-Aided Manufacturing A1N (Avancerad datorstödd tillverkning A1N). It comprises 6 credits and is a second-cycle course. The level of progression is A1N.

The course is a part of the main field of study in Virtual Product Realization. The disciplinary domain of the course is Technology.

2. Entry requirements

A Bachelor's degree equivalent to a Swedish kandidatexamen of 180 credits, within the main fields of integrated product development, production engineering, automation engineering, mechanical engineering or information technology (or equivalent).

A further requirement is proof of skills in English equivalent of studies at upper secondary level in Sweden, known as the Swedish course English 6 or English level 2 (or the equivalent). This is normally demonstrated by means of an internationally recognized language test, e.g. IELTS or TOEFL.

3. Course content

The course provides an overview of how cutting toolpath is planned for component CAD models involving inclined flat surfaces and freeform surfaces which require multiple-axis machine tools for their manufacturing. The students will learn the mathematics of curves and surfaces in computer-aided engineering software environment, and how the toolpath is derived based on this information. The students will also practice manufacturing process planning for a given part CAD Model with inclined flat surfaces and freeform surfaces with CAM software.

4. Objectives

After completion of the course, the student shall be able to:

- describe and apply the fundamental mathematics of curves and surfaces in computer-aided engineering software environments,
- explain the operations of machining with multiple-axis CNC machine tools,
- interpret toolpath generation algorithms for inclined flat surfaces and freeform surfaces, and evaluate toolpath based on machining accuracy requirements,
- discuss in detail manufacturing processes of multiple-axis machining.
- demonstrate a practical knowledge of manufacturing process planning for multiple-axis machining with a given component.

5. Examination

The course is graded A (Excellent), B (Very good), C (Good), D (Satisfactory), E (Sufficient) or F (Fail).

The examinations of the course consist of the following modes of assessment:

- **Written assignment**
  2 credits, grades: G/U
- **Laboratory assignment**
  1 credit, grades: G/U
- **Project assignment**
  3 credits, grades: A/B/C/D/E/F (determines the final grade)

Students with a permanent disability who have been approved for directed educational support may be offered adapted modes of assessment.

6. Types of instruction and language of instruction

The teaching is comprised of lectures, exercises and laboratory sessions.

The teaching is conducted in English.

7. Course literature and other educational materials

Course materials will be available to download from the learning platform.

8. Student influence

Student influence in the course is ensured by means of course evaluation. The students are informed about the results of the evaluation and potential measures that have been taken or are planned, based on the course evaluation.

9. Additional information

Further information about the course, as well as national and local governing documents for higher education, is available on the website of the University of Skövde.