UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

COURSE SYLLABUS

Virtual Process Modelling A1F

12 credits

Course code: VP765A
Version number: 2
Valid from: 1 July 2024
Ratified by: Curriculum Committee for Engineering Science
Date of ratification: 7 March 2024

1. General information about the course

The course is provided by the University of Skövde and is named Virtual Process Modelling A1F (Virtuell processmodellering A1F). It comprises 12 credits and is a second-cycle course. The level of progression is A1F.

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 and passed 7.5 credits in Strength of Materials and passed 7.5 credits in Finite Element Method (or the 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. This is normally demonstrated by means of an internationally recognized language test, e.g. IELTS or TOEFL.

3. Course content

A key part of modern virtual commissioning is the simulation of processes on a detailed physical level. This course will cover skills and knowledge required to work in this domain, including; a review of relevant understanding of the physics that needs to be simulated for a range of manufacturing processes, the skills required to assess the numerical methods that are usually utilised to build and refine models of these manufacturing processes, and understanding of how the models will behave and writing specialised programs to analyse the results of different simulations. Students will also learn to present their modelling processes and results in a clear manner so that they can be reused by other professionals working in the production process.

4. Objectives

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

- give a high-level account of the physics underlying different virtual manufacturing processes,
- be able to credibly model a manufacturing process with a digital tool as well as analyse, interpret results and argue for the validity of the model and the results,
- document and present detailed results from a modelling process along with the explanation for their validity,
- critically review, assess and argue for the choice of numerical method for use in a specific virtual manufacturing process,
- show an understanding of how digital tools can be used to develop a sustainable manufacturing process.

5. Examination

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

The final grade of the course is determined by the average of the grades for the all examination parts where A=5, B=, C=3, D=2 and E=1. The average value is rounded to the nearest integer (half rounded up) and translated into a final grade according to 5=A, 4=B, 3=C, 2=D and 1=E.

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

- **Project assignment 1**
  3 credits, grades: A/B/C/D/E/F
- **Project assignment 2**
  3 credits, grades: A/B/C/D/E/F
- **Project assignment 3**
  3 credits, grades: A/B/C/D/E/F
- **Project assignment 4**
  3 credits, grades: A/B/C/D/E/F

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, seminars and laboratory sessions.

The teaching is conducted in English.

7. Course literature and other educational materials

The course literature consists of a set of chosen scientific articles and book chapters. A list of these are provided by the course director and are listed on the course home page for each time the course is given.

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.