

Course syllabus for

P44: Realizing human-robot collaboration through the use of virtual tools

Syllabus adopted 2019-12-10 by Professor Bengt-Göran Rosén, Produktion2030 Head of Education



Credits	5 hec
Grading scale	Satisfactory/not satisfactory
Education cycle	Third-cycle
Examiner	Anna Syberfeldt, professor in Production Engineering at the University of Skövde
Eligibility	A Master's degree in production engineering or equivalent
Aim	The course aims to give knowledge of how virtual tools can be used as a mean to successfully realize industrial human-robot collaboration. The course also aims to give the participants knowledge in how a human-robot development project can be undertaken, considering critical aspects such as efficiency, safety and ergonomics.
Intended learning outcomes	<p>After completion of the course the course participant should be able to</p> <ul style="list-style-type: none"> • Discuss state-of-the-art research related to human-robot collaboration. • Use virtual tools to plan, design and evaluate a human-robot collaboration application.

- Use virtual tools to undertake basic analysis of efficiency, safety and ergonomics related to human-robot collaboration applications.
- Implement a simple human-robot collaboration scenario in reality (using physical lab equipment) based on a virtual model.
- Reflect upon aspects related to ethics and sustainability in the context of human-robot collaboration.

Course content

In the course, the students will work both with virtual tools and with physical equipment. The lab tasks in the course will challenge the students to set up application scenarios in a virtual environment, including problem identification, design of solutions and evaluation of the scenarios. To some extent, the students will also implement their solutions in a practical lab environment in order to realize the potential of a virtual development approach. State-of-the-art research within the field of human-robot-collaboration will also be presented and discussed in the course.

It is necessary to understand spoken Swedish to participate in the course, but you don't have to be able to speak or write in Swedish.

Course organisation

Four physical meetings, each two subsequent days. Participation in the meetings is mandatory, but occasional absence can be compensated for. In 2020, the course is held the following dates: the following dates: 20-21/2, 5-6/3, 19-20/3 and 2-3/4. The course is held at ASSAR Industrial Innovation Arena in Skövde.

Examination

A successful completion of this course will be judged on the following:

- Practical laboratory experiments
- Participation in discussions
- Project assignment

Literature

Relevant study material will be handed out during the course.