



COURSE SYLLABUS

Safety and Security for Software Products, 7.5 credits

Safety and Security for Software Products, 7,5 högskolepoäng

Course Code: TSSR20	Education Cycle: Second-cycle level
Confirmed by: Dean Mar 1, 2020	Disciplinary domain: Technology
Revised by: Director of Education May 14, 2020	Subject group: DT1
Valid From: Aug 1, 2020	Specialised in: A1N
Version: 2	Main field of study: Product Development

Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- demonstrate comprehension of basic safety and security concepts in the software domain
- show familiarity with safety and security standards in the development of products with software content

Skills and abilities

- demonstrate the ability to apply tools and methods to handle safety & security issues during the development of products with software content
- demonstrate the ability to analyse differences, commonalities and interdependencies between the safety and security domains

Judgement and approach

- demonstrate the ability to evaluate different techniques to ensure safety and security on a software and a system level
- demonstrate the ability to reflect upon the challenges and opportunities in the safety and security domains due to the introduction of machine learning, artificial intelligence, and data science.

Contents

The course explores software functionality in terms of the impact and differences between safety and security as they pertain to software-based products and their dependency on hardware and information content. The course illustrates analytical and design considerations of how to deliver software that is safe to use and secure against intrusions and attacks. Nowadays, machine learning, artificial intelligence and data science are bringing new challenges and opportunities to the safety and security domains from an ethical point of view. In relation to this, the course will present research that focus on these challenges and opportunities.

The course includes the following topics:

- Safety and security failures of software systems
- The role of safety and security standards
- Safety versus security, and cross-cutting issues
- Assessing safety and security (including risk management and hazard analysis)
- Software dependability engineering (including availability, reliability, redundancy and fault tolerance)
- Safety and security software assurance
- Recent research within the safety and security domains in relation to the introduction of machine learning, artificial intelligence, and data science

Type of instruction

The course will consist of lectures, seminars, exercises and practical work in the form of a group assignment.

The teaching is conducted in English.

Prerequisites

The applicant must hold the minimum of a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in computer engineering, electrical engineering (with relevant courses in computer engineering), or equivalent. The bachelor's degree should comprise a minimum of 15 credits in mathematics. Proof of English proficiency is required.

Examination and grades

The course is graded 5,4,3 or Fail.

The final grade for the course is based upon a balanced set of assessments. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Written examination	2.5 credits	5/4/3/U
Assignment	2.5 credits	5/4/3/U
Laboratory work	2.5 credits	U/G

Course literature

The literature list for the course will be provided one month before the course starts.

Course material, including scientific articles, will be provided during the course.