UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

COURSE SYLLABUS

Cybersecurity for Internet of Things and Critical Infrastructures A1N

7.5 credits

Course code: IT816A
Version number: 4
Valid from: 1 January 2026
Ratified by: Curriculum Committee for Informatics
Date of ratification: 15 May 2025

1. General information about the course

The course is provided by the University of Skövde and is named Cybersecurity for Internet of Things and Critical Infrastructures A1N (Cybersäkerhet kring sakernas internet och kritiska infrastrukturer A1N). It comprises 7.5 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 Informatics. The disciplinary domain of the course is Technology.

2. Entry requirements

A Bachelor's degree (equivalent to a Swedish kandidat examen) within the fields of informatics or computer science or equivalent.

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

3. Course content

Internet of Things (IoT) is poised to change technological infrastructures, including critical infrastructures. The aim of this course is to introduce a wide variety of security and privacy issues associated with the Internet of Things. The course also discusses and problematizes the interweaving interplay between IoT and cyber-physical systems which are increasingly contributing to the foundation of evolving Smart-X applications and to the core of Industry 4.0 revolution, as well as contemporary critical infrastructures. Vulnerabilities across these highly-networked structures are presented along metrics used to quantify their severity. Models of threats exploiting those vulnerabilities and resulting attack impact patterns are elaborated to understand the concepts involved in cybersecurity risk-assessment.

4. Objectives

After completed course the student should be able to:

- explain the Internet of Things (IoT) and critically reflect on related security issues
- explain and critically reflect on IoT platforms and illustrate their security and privacy aspects
- in an in-depth way discuss vulnerabilities affecting critical infrastructures
- analyze threats and attack models, and devise countermeasures for IoT devices, and
- critically evaluate potential threats to cyber-physical systems prevalent in critical and Industry 4.0 infrastructures

5. Examination

The course is graded VG (Pass with distinction), G (Pass) or U (Fail).

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

- **Laboratory assignments**
  3 credits, grades: VG/G/U (determines the final grade)
- **Report**
  2 credits, grades: G/U
- **Seminar assignment**
  2.5 credits, grades: G/U

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 comprises lectures and seminars/group discussions, as well as hands-on practices on tools and application programming interface (API) used to root-out cyber-security vulnerabilities and model related threats, or simulate consequent-attack impacts.

The teaching is conducted in English.

7. Course literature and other educational materials

Articles and other materials will be provided by the course coordinator.

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

The content of the course corresponds completely or partially with the following course(s) and cannot be included in the required credits of a degree qualification:

- IT747A - Cyber Security for Internet of Things and Critical Infrastructures A1N 7.5 credits

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.