DD2528 Dependable Autonomous Systems 7.5 credits

Pålitliga autonoma system

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for DD2528 valid from Autumn 2019

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Computer Science and Engineering

Specific prerequisites

Completed courses equivalent:

SF1671 Mathematics, basic course with discrete mathematics
DD1337 Programming
DD1338 Algorithms and Data Structures
DD1350/DD1351 Logic for Computer Scientists
DD1393 Software Engineering

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After a passed course, the student should be able to

• represent data structures and their mutual dependencies as mathematical structures and formulate dependability properties by means of propositional logic,

• specify dynamic behaviour of autonomous systems and their properties,

• use risk assessment and safety analysis techniques to define dependability requirements,

• model and verify autonomous systems by means of automatic tools

in order to

· be able to work with autonomous safety critical systems in research and/or development,

• be able to identify risks in connection with autonomous systems and use modelling, verification and security techniques to prevent them.

Course contents

Techniques to achieve dependability, safety analysis, derivation of dependability requirements from safety analysis, modelling and verification of safety requirements, safety assurance case, multi-agent systems, emergent behaviour, goal-oriented modelling and verification of safe and reliable multi-agent autonomous systems, evolutionary algorithms and learning algorithms for mission planning and navigation, safety of mission planning.

Course literature

Information about the course literature will be announced in the course memo.

Examination

• TEN1 - Written exam, 2.0 credits, grading scale: A, B, C, D, E, FX, F

• LAB1 - Laboratory work, 5.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

The examiner decides, in consultation with KTH's coordinator for disabilities (Funka), about possible adapted examination for students with documented, permanent disabilities. The examiner may permit other examination format for re-examination of individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.