



MG2142 Distributed Intelligent Automation Systems, Extended Course 7.5 credits

Distribuerade intelligenta styrsystem för produktion, större kurs

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

Establishment

Course syllabus for MG2142 valid from Autumn 2014

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

MG1002 Automation technology and

DD1320/1321 Applied computer science

or equivalent knowledge

Students with programming experience should take the course MG2042 instead

Language of instruction

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

Intended learning outcomes

After completing the course requirements, you should be able to:

- explain the main advantages and disadvantages and limitations of applying object-oriented programming in a production automation context.
- design and implement algorithms and programs in Java for control system.
- explain the principles of modern production systems and how they differ from traditional methods.
- critically review and compare advantages and disadvantages of modern and traditional automation, and how these influence the role of human operators in the production system.
- compare the most important modelling methods for distributed and intelligent control systems for automation.
- critically review the fundamentals, advantages and disadvantages of different architectures for distributed control systems for automation.
- develop and implement distributed control systems that are based on theories of complex systems and artificial intelligence, to create adaptable and sustainable production solutions.
- develop, deploy, and execute robust Multi-Agent control Systems (MAS) within advanced mechatronic control devices.

Course contents

- Principles and system architecture for modern production systems
- Distributed control systems for automation
- Theories of complex systems
- Artificial intelligence
- Multi-Agent Systems
- JAVA programming

Course literature

- Föreläsningsmaterial tillgängligt på Bilda
- Samling av vetenskapliga artiklar tillgängliga på Bilda

Rekommenderat extramaterial:

- "Distributed Systems - Principles and Paradigms", Andrew S. Tanenbaum and Maarten Van Steen, 2nd Edition, ISBN: 0-13-239227-5.

- "Developing Multi Agent Systems with JADE", Fabio Belfemine, Giovanni Caire and Dominic Greenwood, ISBN: 978-0-470-05747-6.

Examination

- PRO2 - Apply a Multi-Agent-System, 1.0 credits, grading scale: A, B, C, D, E, FX, F
- PRO1 - Apply a Service-based Autonomic Production System, 0.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Written Test, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- PRO3 - Develop and Implement MAS for Production System, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB2 - Programming Tasks in JAVA, 1.5 credits, grading scale: P, F
- LAB1 - Laboratory Practical, 1.0 credits, grading scale: P, 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.

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.