Styr- och reglerteknik
Automatic Control

EIEF30, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED E
Date of Decision: 2023-04-11

General Information

Compulsory for: IDA2, IEA2
Language of instruction: The course will be given in Swedish

Aim

The aim of the course is to give the student basic knowledge in Automatic Control
and a good understanding of basic system principles.and implentation aspects
of PLC based automation systems and analog control systems

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to describe fundamental concepts such as dynamic systems,
  time reponses, frequency responses, feedback and stability
- be able to explain the functionality of simple controllers such as PID controllers
- be able to derive mathematical descriptions of basic physical systems.

Competences and skills
For a passing grade the student must

- be able to construct PLC programs for simple automation tasks
- be able to design controllers for simple control tasks.

Contents

- Introduction. Examples of automation systems and control systems.

Definitions and fundamental concepts
- Logic-based vs sequence-based systems. Structuring of simple automation tasks
- Progamming of PLC systems. Ladder diagrams and sequential function charts (GRAFCET)
- Dynamic systems. Description by differential equations. Laplace transforms. Transfer functions. Block diagrams. Derivation of mathematical descriptions of physical models
- Analysis of time-continuous systems. Transient analysis. Frequency analysis
- Analysis of feedback systems. Static control error and load disturbances. Methods for stability analysis
- Design of PI and PID controllers

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: The final grade of the course is based on the result of the written exam. Passed laboratory exercises are required.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts
Code: 0117. **Name:** Automatic Control.
Credits: 4,5. **Grading scale:** TH. **Assessment:** The final grade is based on the result of the written exam. Passed laboratory exercises are required.
Code: 0217. **Name:** Control Technology.
Credits: 3. **Grading scale:** UG. **Assessment:** Passed laboratory exercises.

Admission

Admission requirements:

- Part 0117 Algebra from the course FMAA50 Calculus or Part 0107 Algebra from the course FMA645 Calculus

Assumed prior knowledge: FMAA50/FMA645 Calculus and EITA40/ETE604 Circuits and Measurements.
The number of participants is limited to: No
The course overlaps following course/s: FRT602

Reading list

- Bertil Thomas: Modern reglerteknik. Liber, 2016, ISBN: 9789147112128.
- Supplied material.

Contact and other information

Course coordinator: Mats Lilja, Mats.Lilja@hbg.lth.se
Course homepage: https://www.lth.se//iea/utbildning/kurser-paa-campus-helsingborg/styr-och-reglerteknik/