SYLLABUS

Robotics for all 7.5 credits R0006E

Robotik för alla

Course syllabus admitted: Autumn 2022 Sp 1 - Spring 2023 Sp 4

DECISION DATE
2021-02-17

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Robotics for all 7.5 credits R0006E

Robotik för alla

First cycle, R0006E

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Reglerteknik	Automation Technology

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language +
Swedish upper secondary school courses Mathematics 3b or 3c, Mathematics C.

Selection

The selection is based on final school grades or Swedish Scholastic Aptitude Test.

Examiner

George Nikolakopoulos

Course Aim

After the course, the student shall be able to:

- Have an understanding of the Ubuntu operating system and command line interface
- Program simple codes for robots
- Design basic digital logic code
- Program basic functionalities in MATLAB, LABVIEW, and Python
- Utilize the Robotic Operating System (ROS)
- Utilize the Robot simulation Environment (Gazebo)
- Master basic capabilities in 3D modelling and printing in Robotics
- Select proper sensors and embedded computers for robotic applications
- Identify different types of robots and their basic operating principles
- Utilize basic robotic models for control
- Utilize simple path planning principles
- Utilize and combine in applications different functionalities from the field of Robotic Vision

Contents

The course will provide och teach about fundamental concepts of robotick priciples such as perception, cognition, intelligence, path planning, path tracking, autonomous task execution, localization, sensing and actuating.

The course will also include an introduction to basic hardware for the development of robotic platforms such as drones, mobile robots and robotic arms.

We will also provide an introduction to programming tools for Robotics and AI such as Python, the physics based simulation environment Gazebo and the Robotic Operating System (ROS).

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Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.

The course will be provided a set of multiple and short length online lectures, combined with live discussion sessions and remote virtual labs.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

Web based course assignments to assess student abilities in understanding Robotics and AI technology and algorithms and how these can be applied to solve real life problems.
The assignments will be given through out the course in order to evaluate student’s course understanding and feedback will be given for the continuation of the course.

Literature. Valid from Spring 2021 Sp 3

Collection of online public sources.

Lecture slides.

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Compulsory assignments	G U 3 4 5	7.5	Mandatory	S21	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Jonny Johansson, HUL SRT 2021-02-17

Syllabus established

by Jonny Johansson, HUL SRT 2020-06-18

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