Subject code	Credits
INF3040	4

Course title in Lithuanian

ROBOTIKA

Course title in English

ROBOTICS

Short course annotation in Lithuanian (up to 500 characters)

Kurse studentai su pažindinami su nuostabiu mobilios robotikos pasauliu. Studentai išmoks sukonstruoti paprastus (mobilius) robotus, parinkti tinkamus sensorius ir aktuatorius bei juos suderinti. Jie išmoks pasirinkti tinkamas programavimo aplinkas, suprogramuoti modulinę programinę įrangą roboto nuotoliniam valdymui ar autonominiam veikimui. Visa teorinė medžiaga bus išbandyta praktinių užsiėmimų metu.

Short course annotation in English (up to 500 characters)

This course introduces students to a wonderful (mobile) robotic world. Students will be able to build simple (mobile) robots, choose proper sensors and actuators, and calibrate them. They will be able to choose the right development environment, build modular software that allows controlling a robot remotely or robot operate autonomously. All theoretical material will be tried practically.

Prerequisites for entering the course

Undergraduate courses: Mathematics

Course aim

To enable students to build simple (mobile) robots and to build modular software for robot control.

Content

No	Content (topics)
1.	Introduction. Robotics. Mobile Robotics.
2.	Sensors: types, calibrations, and usage.
3.	Control algorithms. PID regulators.
4.	Robot programming. Arduino.
5.	Localization.
6.	Line following.
7.	Obstacle avoidance.
8.	Computer vision in robotics.
9.	Trajectory planning.
10.	Robot architectures.
11.	Humanoid robot action generalisation.
12.	Human-robot interaction.

Distribution of workload for students (contact and independent work hours)

Lectures	**30 hours**
Laboratory work	**30 hours**
Individual students work	**50 hours**
Total:	**110 hours**

Structure of cumulative score and value of its constituent parts

Final written exam (50%), mid-term written exam (17%), and assessments of laboratory (practical) work (33%).

Recommended reference materials

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	*Self-study rooms*	*Other libraries*
Basic materials						
1.	2010	LEGO Mindstorms NXT-G Programming Guide, J.F. Kelly,	Springer			Internet link: http://goo.gl/nqaSo
2.	2010	Robot Manipulators Trends and Development	InTech			Internet link: http://goo.gl/2fiDh
3.	2012	Microsoft Robotics Studio tutorials	Microsoft			Internet link: http://www.microsoft.com/robotics/#Learn
4.	2010	Mobile Robots Navigation	InTech			Internet link: http://goo.gl/L4cW8

Supplementary materials				
1.	2012	Artificial Intelligence	Stanford	Internet link for video lectures: http://goo.gl/irfHi
2.	2010	From Bricks to Brains: The Embodied Cognitive Science of LEGO Robots	AU Press	Internet link: http://www.aupress.ca/index.php/books/120175
3.	2012	Robotics: exploring solutions for today and tomorrow	Education Society	Internet link: http://www.gateways2learning.ca/Robotics/ca1.html

Course programme designed by

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