EDINBURGH CENTRE FOR ROBOTICS
Innovation Ready
edinburgh-robotics.org

B31YS-Robotics Systems Science

Autumn Semester 2018

STAFF:

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Location:	EM2.23 and EM 3.02

ORGANISATION:

Equipment will normally kept in EM2.23.

Lab safety procedures require there should be at least one other person present when working.

Timetabled slots are:

Monday	10.15am – 11.15 EM3.02
Monday	13.15pm – 15.15 SR3.20
Monday	16.15am – 17.15 EM3.02
Thursday	16.15am – 17.15 EM3.02
Friday	13.15am – 15.15 SR3.20

OBJECTIVE:

This course will be a Masters degree level introduction to several core areas in robotics: kinematics of robots; robot control; motion planning; state estimation and signal processing; localization and mapping; computer vision for robotics; robotics architectures, tools and approaches for system integration. Lectures on these topics will be complemented by a large practical that exercises knowledge of a cross section of these techniques in the construction of an integrated robot system in the lab, motivated by a task such as robot navigation. Also, in addition to lectures on algorithms and lab sessions, we expect that there will be several lecture hours dedicated to discussion of implementation issues - how to go from the equations to code.

The aim of the course is to present a unified view of the field, culminating in a practical project involving the development of an integrated robotic system that actually embodies key elements of the major algorithmic techniques.

A series of challenges will be undertaken in pairs involving progressively more complex programming activities.

Periodic assessments will be carried out during the course involving demonstration and discussion. A set of individual projects will be set for the final part of the course.

LEARNING RESOURCES:

Turtlebot:	http://www.turtlebot.com
	http://learn.turtlebot.com
	http://www.clearpathrobotics.com/guides/turtlebot/
Robot Operating System (ROS):	http://wiki.ros.org/ROS/Tutorials

Good free online ROS textbook:	https://cse.sc.edu/~jokane/agitr/
Command Line Tools for LINUX:	http://www.ee.surrey.ac.uk/Teaching/Unix/
Turtlebot and ROS:	http://wiki.ros.org/Robots/TurtleBot
	http://wiki.ros.org/turtlebot_bringup/Tutorials
Visualisation:	http://wiki.ros.org/rviz
Navigation:	http://wiki.ros.org/turtlebot_navigation/