iTMO

ITMO University

Robot Programming

Course Workload		Assessment form (examination/ graded test/ ungraded test)
ECTS	**Hours**	
3	**108**	**Credit**

The course program covers the practical basics of robot programming. During the course, you will become familiar with the basics of Linux Ubuntu, the basics of programming in the Python version 3 and the basics of ROS1. The course will solve many interrelated problems, the result of which will be the solution to the task of the robot's movement along the road while avoiding obstacles.

Course structure:

1. Introduction to the basics of robot programming

1.1. Overview robotic software architectures
1.2. Linux basics
1.3. Command line basics
1.4. Programming basics
1.5. Build systems
2. Robots control using ROS

2.1. Software communication concepts
2.2. ROS1 communication concept and main features
2.3. ROS1: robot control concept
3. Physics simulation

3.1. Sim2Real problem in robotics
3.2. Review of physics simulators
3.3. Gazebo basics
4. Processing and visualization of sensor data

4.1. Data processing for robots control
4.2. rqt tools in ROS
5. Orchestration systems

5.1. Finite state machine
5.2. Behavior trees