ITMO University

Cyber Physical Systems and Technologies

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

What do a smart kettle and an industrial robot have in common? Now, the line between the real and the virtual world has practically disappeared. Information technologies affect objects of the physical world directly, without human participation. The Internet of Things, Machine Learning, and Cloud Computing are parts of a cyber-physical system. The discipline " Cyber Physical Systems and Technologies" will acquaint you with the main modern software and hardware of cyber-physical systems, the possibilities of their integration, as well as new technologies that can change our lives in the future. You will learn about the latest trends in the development of cyber-physical systems and advanced scientific developments related to the implementation of cyber-physical systems in industrial production, control of complex technological processes, robotics and electric drive.

Course structure:

1. Low level of CPS development

1.1. The hardware part of cyber-physical systems
1.2. The software part of cyber-physical systems
1.3. Introduction to Cyber Physical Systems
1.4. Communication protocols used in cyber-physical systems

2. High level of CPS development

2.1. High-level protocols
2.2. Data analysis and machine learning
2.3. Cloud and Fog Computing

3. Technologies used in CPS

3.1. New technologies: 3D printing, 3D scanning, industrial robotics, augmented and virtual reality