ITMO University

Modern Control Systems

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

The aim of this discipline is to consider the modern control systems such as adaptive, robust, and optimal control systems. The discipline goes over the fundamental algorithms of adaptive, robust, and optimal control for scalar and multidimensional plants, with the state vector being either measurable and immeasurable. Attention is paid to the plants parameterization used for parameters identification, adaptive state observers design and model reference adaptive control as well.

Course structure:

1. Adaptive State Control for Linear Plants

1.1. Adaptive Control for Scalar Plants
1.2. Lyapunov Function Method
1.3. Adaptive Control for Multidimensional Plants

2. Adaptive Output Control for Linear Plants

2.1. Standard Error Models
2.2. Augmented Error Approach
2.3. Parametrization of Linear Plant Model

3. Calculus of variations

3.1. Euler–Lagrange equation
3.2. Linear quadratic regulator
3.3. Transversality conditions

4. H∞-control

4.1. H∞-norm
4.2. H∞-controller design