Course Unit Descriptor

Study Programme: Biomedical engineering

Course Unit Title: System Modeling and Simulation

Course Unit Code: BMI124

Name of Lecturer(s): Čapko Darko

Type and Level of Studies: Bachelor

Course Status (compulsory/elective): compulsory

Semester (winter/ summer): summer

Language of instruction: english

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 6

Prerequisites: none

Course Aims:.

Mastering theoretical and practical basics of system modeling and simulation.

Learning Outcomes:
- Software package for system modeling and simulation,
- role of modelling and simulation and their practical applications,
- principles of dynamical systems modelling,
- understanding methods and techniques for dinamic models analysis and syntheses,
- ability to describe systems by differential equations,
- ability to perform model simulation,
- acquired knowledge about methods for identification of unknown model parameters.

Acquired knowledge can be used in solving specific engineering problems, and also present a basis for further understanding of professional courses.

Syllabus.

Place and role of modelling and simulation, practical applications. Theory of modelling and simulation, basic principles and mathematical modelling tools. Mathematical models of time continuous and discrete systems. Examples of model forming: mechanical, thermal, hydrodynamic, electrical and electro-mechanical systems. Analogies between size and parameters. Electromechanical analogies. Model linearization. Simulation languages. Simulation on digital computer. System identification. Parameter identification.

Required Reading:

Weekly Contact Hours: 2	**Lectures: 3**	**Practical work: 0**

Teaching Methods:

Lectures. Computer practice. Consultations.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Attendance			
Computer exercises			
Tests (4x)			