

Course code																																	
Type and description	Background Course																																
ECTS credit	2																																
Course name	Modeling of Dynamical Systems																																
Course name in Polish	Modelowanie systemów dynamicznych																																
Language of instruction	English																																
Course level	8 PRK																																
Course coordinator	prof. dr hab. inż. Andrzej Bartoszewicz																																
Course instructors	prof. dr hab. inż. Andrzej Bartoszewicz																																
Delivery methods and course duration	<table><tr><td></td><td>Lecture</td><td>Tutorials</td><td>Laboratory</td><td>Project</td><td>Seminar</td><td>Other</td><td>Total of teaching hours during semester</td></tr><tr><td>Contact hours</td><td>5</td><td>0</td><td>10</td><td>0</td><td>0</td><td>0</td><td>15</td></tr><tr><td>E-learning</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td></td></tr><tr><td>Assessment criteria (weightage)</td><td>0,33</td><td></td><td>0,67</td><td></td><td></td><td></td><td></td></tr></table>		Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester	Contact hours	5	0	10	0	0	0	15	E-learning	No	No	No	No	No	No		Assessment criteria (weightage)	0,33		0,67				
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Course objective	1. The aim of the course is to acquaint students with basic concepts in modeling of dynamical systems. 2. The course aims at developing skills and knowledge needed for modeling of dynamical systems, in particular modeling the systems using computer simulation programs.																																
Learning outcomes	After completing the course the student: 1. knows and understands the principles of mathematical modeling of dynamical systems; - W1, W4 2. can describe how differential and difference equations arise in modelling of electric, electronic and electromechanical systems; - U3 3. is able to derive mathematical models of electric, electronic and electromechanical systems based on fundamental physical relations, - U3 4. is prepared to critically asses obtained results of modeling and simulations – U3, K1, K2.																																
Assessment methods	Outcomes 1, 2 – oral presentation Outcome 3, 4 – homework.																																
Prerequisites	Elementary physics, basics of ordinary differential equations, fundamentals of mechanical and electrical engineering.																																
Course content with delivery methods	LECTURE 1. Principles of mathematical modeling of dynamical systems. 2. Types of models, model simplification. 3. Application the Lagrange formalism for modeling electric, electronic and electromechanical systems. 4. Basics of simulation methodology, numerical errors, computer simulation tools. LABORATORY 1. Introduction to modeling and simulation of electromechanical dynamical systems. 2. Selection of appropriate means for modeling, simulation and dissemination of results.																																

Basic reference materials	1. P. P. J. van den Bosch, A. C. van der Klauw, Modeling, Identification and Simulation of Dynamical Systems, CRC Press.
Other reference materials	1. Selected internet sources.
Average student workload outside classroom	35 h
Comments	
Last update	