

Title: Modeling and simulation (VSP-I-2-3-A)

Lecturer: Assoc. Prof. Dr. Maja Atanasijević-Kunc

Aim of the course:

To present basic knowledge regarding modeling and simulation of continuous, dynamical systems.

Required (pre)knowledge:

Basic course of mathematics, basic course of physics.

Contents:

Description of model classification, approaches to modeling, cyclic modeling procedure, model verification and validation. Survey of mathematical model descriptions, transformations and system analysis.

Introduction to continuous systems simulation principals and basic simulation schemes development. Matlab and Simulink usage description.

Presentation of simple identification approaches and model optimization.

Theoretical modeling, description of analog systems and their importance regarding system engineering. Illustration examples from electrotechnics, mechanics, hydraulics, pneumatics and thermodynamics.

Case studies of design using laboratory pilot plants.

Selected references:

François E. Cellier: Continuous System Modeling, Springer-Verlag, New York, 1991.

François E. Cellier, Ernesto Kofman: Continuous System Simulation, Springer Science + Business Media, New York, 2006.

Drago Matko, Rihard Karba, Borut Zupančič: Simulation and modelling of continuous systems, A case study approach. New York: Prentice Hall, 1992.