Course Unit Descriptor

Study Programme: Energy And Process Engineering

Course Unit Title: Pipe Networks Modelling

Course Unit Code: M35I32

Name of Lecturer(s): Tašin Slobodan, Bikić Siniša

Type and Level of Studies: Master Academic Degree

Course Status (compulsory/elective): elective

Semester (winter/ summer): winter

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:.

Acquiring knowledge and skills necessary for designing, analysis and management of complex systems for distribution of liquids and gases.

Learning Outcomes:
Designing and modelling of pipe networks. Analysis of steady flow in pipe networks. Extended time simulations. Transients in pipe networks. Control and management of systems for distribution of liquids and gases.

Syllabus.
Basic equations of steady flow in pipe networks. H- method. Q-method. ?Q-method. Hybrid methods. Specific devices for control and regulation of pipe networks (reservoirs, pump stations, control devices, safety devices)
Extended time simulation of pipe networks. Application of mathematical models in pipe networks control and management.
Transients in pipe networks. Mathematical model of waterhammer. Mathematical model of oscillatory flow in pipe networks. Transients control in pipe networks.

Required Reading:
Relevant literature in English, tbd

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

Teaching Methods:
Lectures: combination of modern (presentations, simulations) and classic (chalk and blackboard).
Computational practice (15 weeks): programming simple programs for steady state and extended time simulation of pipe networks, programming simple programs for simulation of transients in pipe networks.

Knowledge Assessment (maximum of 100 points):

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