Course Unit Descriptor

Study Programme: Energy and Process Engineering

Course Unit Title: Fluid Mechanics 2

Course Unit Code: M3401

Name of Lecturer(s): Maša Bukurov

Type and Level of Studies: Bachelor level

Course Status (compulsory/elective): compulsory

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:7

Prerequisites: none

Course Aims:

Introduction to the basic properties and relations valid for non-Newtonian fluids. Introduction to the compressible fluid flow, basic laws and relations. Enabling students to solve computing problems of compressible fluid flow.

Learning Outcomes:

Ability to solve numerical problems of non-Newtonian fluid flow. Acquisition of knowledge in the field of gas dynamics for solving practical problems.

Syllabus:

Non-Newtonian fluids. Classification of fluid behavior. Non-compressible fluid flow in pipes. Determining flow characteristics. Laminar flow. Profile speed in laminar flow. Laminar fluid flow without bias. Non-isothermal flow. Turbulent flow. The flow of two phase mixture of gas and liquid in pipes. Polymers. Compressible fluid flow. Historical facts and introductory notes. Basic flow equations of compressible fluid. Basic characteristics of compressible fluid flow. Propagation of disturbances in the compressible fluid. Quasi one-dimensional isentropic steady flow. Schock waves. Oblique expansion waves – Prandtl-Meyer flow. Quasi onedimensional stationary compressible fluid flow with friction. Quasi one-dimensional stationary diabatic flow.

Required Reading: Relevant literature in English TBD

Weekly Contact Hours:4	**Lectures:3**	**Practical work:1**

Teaching Methods:

Students prepare one part of the course in advance and then discuss it during the class. Modern teaching means are used, but also the board and the chalk. During the practice problems from examination are solved. Students are obliged to attend lectures regularly and to be prepared for them. Both counts – attendance with 10, and preparedness with 20 points.

Knowledge Assessment (maximum of 100 points):100

Pre-exam obligations	points	**Final exam**	points
Lecture attendance	5	Oral part of the exam	50
Exercise attendance	5		
Test	10		
Test	10		
Test	10		
Test	10		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.