Study program: Urban Engineering	
Type and level of studies: Basic academic studies	
Course unit: Fluid Mechanics	
Teacher in charge : Dobrica M. Milovanović, Slobodan R. Savić	
Language of instruction: English	
ECTS: 7	
Prerequisites: None	
Semester: Summer Semester	

Course unit objective

The main course objective is to introduce concepts, principles, laws, observations, and models of fluids at rest and in motion, as well as to apply all these equations to analyze fluid problems by making good assumptions and learn systematic engineering method to solve practical fluid mechanics problems.

Learning outcomes of Course unit

Upon successful completion of this course the students will gain a fundamental physical and mathematical understanding of fluid mechanics. By this, it is implied that the student will be able to correctly apply the course content (given in an outline below) to new situations so as to evaluate potential industrial applications of fluid theory through both physical induction and mathematical analysis/computation.

Course unit contents

Theoretical classes

Introduction to Fluid Mechanics - Physical properties of fluids (density, compressibility, viscosity, friction**, s**pecific heat capacity, thermal conductivity). Eulerian and Lagrangian description of fluid motion. Fluid statics - pressure distribution, hydrostatic forces on surfaces. Conservation of mass, energy, and momentum equations (Euler equation), Bernoulli's equation. Dimensional analysis and similarity. Laminar and turbulent flow – Navier-Stokes equations, Reynolds' equations. Flow in pipes Pipe systems, flow through series and parallel pipes, head loss, friction losses. Fluid outflow.

Practical classes

Practical training designed to reinforce the syllabus and answer any questions the student may have regarding specific areas

Literature

F. M. White, Fluid Mechanics (7th Edition), Mcgraw Hill, 2011

Y. Nakayama, R.F. Bouche, Introduction to Fluid Mechanics, Arnold, London, 1999.

Number of active teaching hours				**Other classes**
Lectures: 2	Practice: 2	Other forms of classes: -	Independent work: -	**-**

Teaching methods

Examination methods (maximum 100 points)			
Exam prerequisites	**No. of points:**	**Final exam**	**No. of points:**
Student's activity during lectures	**10**	oral examination	30
Practical classes/tests	**40**	written examination	-
Seminars/homework	**20**		

Grading system		
Grade	**No. of points**	**Description**
10	91 - 100	Excellent
9	81 - 90	Exceptionally good
8	71 - 80	Very good
7	61 - 70	Good
6	51 - 60	Passing
5	0 - 50	Failing