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Name o	f the module/subject		ESCRIPTION FORM	Code	
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Field of	study		Profile of study	Year /Semester	
Civil	Engineering Fire	st-cycle Studies	(general academic, practical) (brak)	2/3	
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Elective	pair//specially	-	Polish	obligatory	
Cycle o	f study:		Form of study (full-time,part-time)		
First-cycle studies			part-time		
No. of h	ours			No. of credits	
Lectu	e: 10 Classes	s: 10 Laboratory: -	Project/seminars:	- 2	
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ema	ail: marcin.skotnicki@p	out.poznan.pl			
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Lectures - written test (15 -20 questions, duration up to 30 min)

Exercises - written test (3-4 problems, duration up to 60 min) and activity

Course description

Physical properties of fluids, real and ideal fluids, forces in fluids. Statics of fluids - basic equation of fluid equilibrium and its application, fluid instruments for pressure measurement, hydrostatic pressure on flat and curved surfaces, diagram of pressure. Basic notion of fluid motion. Dynamics of ideal fluid: Bernoulli?s equation and its interpretation. Motion of real fluid: Reynolds?s experiment, laminar and turbulent flow. Hydraulics of pipelines: linear and local head losses, diagram of piezometric head pressure, hydraulic calculation of single pipeline, siphon, calculation of long pipelines, system of pipe, reservoirs. Fluid motion in pressureless pipelines: steady state flow in open channels, sewage channels, critical flow. Flows in porous media: Darcy?s law, hydraulic conductivity coefficient, inflow to drainage ditch, wells. Hydrological cycle, rainfall-runoff transformation, rainfall characteristics, design storms and flows, IDF-curves.

Basic bibliography:

- 1. Mitosek M.: Mechanika płynów w inżynierii środowiska, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1997
- 2. Orzechowski Z., Prywer J., Zarzycki R.: Mechanika płynów w inżynierii środowiska, Wydawnictwa Naukowo-Techniczne, Warszawa 1997
- 3. Pociask-Karteczka J.: Zlewnia. Właściwości i procesy, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2006

Additional bibliography:

- 1. Ciesielski J.: Zbiór zadań z mechaniki płynów dla kierunku Inżynieria Środowiska (cz. 1), Wydawnictwo Politechniki Poznańskiej, 1986
- 2. Lambor J.: Hydrologia inżynierska, Wydawnictwo Arkady, Warszawa 1970

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	10
2. Participation in excersises	10
3. Work at home	20
4. Preparation for test	10

Student's workload

Source of workload	hours	ECTS		
Total workload	50	2		
Contact hours	30	1		
Practical activities	0	0		