

FLUID MECHANICS

1	Course Title:	FLUID MECHANICS	
2	Course Code:	INS3051	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	3	
6	Semester:	5	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	1	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Doç.Dr. SERDAR KORKMAZ	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	skorkmaz@uludag.edu.tr 0224 24 09 04	
17	Website:	http://insaat.uludag.edu.tr/	
18	Objective of the Course:	To teach the student the theory and application of fluid mechanics, the fundamental of hydraulic engineering	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	To be able to identify the physical properties of fluids
		2	To be able to calculate the hydrostatic forces acting on plane and curved surfaces by means of theory and experiments
		3	To be able to classify the types of fluid flow
		4	To be able to apply the fundamental conservation principles to pressurized and open channel flow problems by means of theory and experiments
		5	To be able to calculate the friction and minor losses in pressurized flows as well as pump and turbine powers
		6	To be able to analyze and design water distribution networks
		7	To be able to calculate the flow rate, depth and force of water and design channels
		8	To be able to improve in observation, measurement and report writing habitude by means of laboratory experiments
		9	
		10	
21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	
1	The field of fluid mechanics, descriptions, dimensions and units		

2	Physical properties of fluids, body and surface forces	Recitation
3	Hydrostatics, governing equation, pressure distribution and measurement	Recitation
4	Hydrostatic forces on plane and curved surfaces	Hydrostatic pressure experiment
5	Kinematics, position, velocity, acceleration vectors, motion and deformation of a fluid element, flow types	Recitation
6	Concepts of system and control volume, Reynolds Transport Theorem	Recitation
7	Conservation of mass, momentum and energy, Bernoulli's equation	Water jet impact experiment
8	General characteristics of flow in pressurized pipes, friction losses, energy and hydraulic grade lines, Darcy-Weisbach and Hazen-Williams equations	Pitot tube experiment
9	Darcy-Weisbach friction factor in laminar and turbulent flows, head loss in single pipe systems, velocity and diameter calculations	Venturimeter experiment
10	Minor losses and flow measurement using venturimeter	Orificemeter experiment
11	Pipes in series and in parallel, equivalent diameter, multi-reservoir systems, junctions	Experiment of friction losses in pipes
12	Solution to water distribution networks using Hardy-Cross method, pumps and turbines	Minor loss experiment

Activites			Number	Duration (hour)	Total Work Load (hour)
Theoretical and gradually varied flow			14	3.00	42.00
Practicals/Labs			14	1.00	14.00
Self study and preparation			Eng. Dept., 2009.	5.00	70.00
Homeworks			6	8.00	48.00
Projects			3	0.00	0.00
Field Studies			0	0.00	0.00
Midterm exams			2	2.00	2.00
Others			0	0.00	0.00
Final Exams			1	2.00	2.00
TERM LEARNING ACTIVITIES		NUMBER	WEIGHT		
Total Work Load					178.00
Midterm Exam		1	30.00		5.93
Total Work load/ 30 hr					
ECTS Credit of the Course					6.00
Home work-project		6	10.00		
Final Exam		1	60.00		
Total		8	100.00		
Contribution of Term (Year) Learning Activities to Success Grade			40.00		
Contribution of Final Exam to Success Grade			60.00		
Total			100.00		
Measurement and Evaluation Techniques Used in the Course					
24	ECTS / WORK LOAD TABLE				

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	4	4	4	0	5	0	0	0	0	0	0	0	0	0	0	0
ÖK3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	5	5	5	0	5	0	0	0	0	0	0	0	0	0	0	0
ÖK5	5	5	5	0	5	0	0	0	0	0	0	0	0	0	0	0
ÖK6	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	5	5	5	0	5	0	0	0	0	0	0	0	0	0	0	0
ÖK8	0	3	3	5	5	0	3	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			