

# 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):	1.00	
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:	<a href="http://insaat.uludag.edu.tr/">http://insaat.uludag.edu.tr/</a>	
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
		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
		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	Improvement in observation, measurement and report writing habit by means of laboratory experiments
		9	
		10	
21	Course Content:		
		<b>Course Content:</b>	
Week	Theoretical	Practice	
1	The field of fluid mechanics, descriptions, dimensions and units		
2	Physical properties of fluids, body and surface forces	Reynolds experiment	

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	Recitation		
9	Darcy-Weisbach friction factor in laminar and turbulent flows, head loss in single pipe systems, velocity and diameter calculations	Experiment of friction losses in various pipes		
10	Minor losses and flow measurement using venturimeter	Minor loss and venturimeter experiments		
11	Pipes in series and in parallel, equivalent diameter, multi-reservoir systems, junctions	Recitation		
12	Solution to water distribution networks using Hardy-Cross method, pumps and turbines	Experiment of water distribution networks		
13	Open channel flow, properties, types and uniform flow equations	Recitation		
Activites		Number	Duration (hour)	Total Work Load (hour)
22	Theoretical Lectures, Textbooks, References and/or Other Materials:	14	3.00	42.00
Practicals/Labs		14	2.00	28.00
Self study and preperation		14	4.00	56.00
Homeworks		12	4.00	48.00
Projects		4	0.00	0.00
Field Studies		0	0.00	0.00
23	Assesment Midterm Exams	1	2.00	2.00
Others		0	0.00	0.00
Final Exams		1	2.00	2.00
Midterm Exam		1	3.00	3.00
Total Work Load				180.00
Total work load/ 30 hr				5.93
Home work-project		12	10.00	
ECTS Credit of the Course				6.00
Total		14	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	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0
ÖK2	4	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0
ÖK3	4	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0
ÖK4	5	5	5	0	4	0	0	0	0	0	0	0	0	0	0	0
ÖK5	5	5	5	0	4	0	0	0	0	0	5	0	0	0	0	0
ÖK6	5	5	5	0	4	0	0	0	0	0	5	0	0	0	0	0
ÖK7	5	5	5	0	4	0	0	0	0	0	5	0	0	0	0	0
ÖK8	0	4	5	5	5	0	0	0	0	0	5	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			