ADVANCED FLUID MECHANICS

1	Course Title:	ADVANCED FLUID MECHANICS
2	Course Code:	INS6052
3	Type of Course:	Optional
4	Level of Course:	Third Cycle
5	Year of Study:	1
6	Semester:	2
7	ECTS Credits Allocated:	5.00
8	Theoretical (hour/week):	2.00
9	Practice (hour/week):	2.00
10	Laboratory (hour/week):	0
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:	
18	Objective of the Course:	To define and solve advanced problems in Fluid Mechanics
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	

	1	To be able to define fluid properties
	2	To be able to solve potential flow and viscous flow problems
	3	To be able to define various flows in open channel
	4	To be able to perform flow routing using analytical and numerical methods
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21	Course Content:	
	Course Content:	
Week	Theoretical	Practice
1	Fluid Properties, Control Volume Analysis, Streamline, Bernoulli equation	
2	Cauchy-stress equations, Navier-Stokes equations, Euler equations, continuity equation	
3	Inviscid, irrotational flows, stream function	
4	Rotational flow, vorticity-stream function	
5	Euler equation, velocity potential	

6	Boundary layer flow, superpositon	
7	Internal and external flows, Laminar and turbulent flows, Reynolds stresses	
8	Velocity profiles, boundary layer equations, lift and drag	
9	Momentum concept, specific force, hydraulic jump	
10	Gradually varied flow	
11	Flow under sluicgate, specific energy and specific force curves	
12	Entrance from a reservoir to an open channel, flow between two reservoirs connected by an open channel	
13	Governing equations in unsteady open channel flow	
14	Kinematic wave equations, analytical solution method	

22	Textbooks, References and/or Other Materials:	Fluid Mechanics 6th Ed, F. M. White, 2008, McGraw Hill. Fundamentals of Fluid Mechanics, B. R. Munson, D. F. Young, T. H. Okiishi, 2003, John Wiley. Fluid Mechanics With Engineering Applications 10th Ed, E. J. Finnemore, J. B. Franzini, 2002, McGraw Hill. Chow V.T., Open-Channel Hydraulics, 1959. French R.H., Open Channel Flow, 1987.
23	Assesment	

Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical		14	2.00	28.00
Quiz	0	0.00		
Practicals/Labs		14	2.00	28.00
Self study and preperation		0	0.00	0.00
Final Exam	1	50.00		
Homeworks		8	12.00	96.00
Projects		0	0.00	0.00
Contribution of Term (Year) Learning Activities to	50.00			
Field Studies		0	0.00	0.00
Midterm exams		1	2.00	2.00
Contribution of Final Exam to Success Grade	50.00			
Others		0	0.00	0.00
Final Exams		1	2.00	2.00
Measurement and Evaluation Techniques Used in the				
Total Work Load				156.00
Total work load / 30				5.20
ECTS Credit of the Course				5.00

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	0	0	0	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