DEPARTMENT OF ENERGY SCİENCE AND TECHNOLOGY
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
EBT303	3			Fall
Title	**T**	**A**	**L**	**ECTS**
Fluid Mechanics	3	2	0	6

Language	German					
Level	**Undergraduate**	**X**	**Graduate**		**Postgraduate**	
Department / Program	Energy Science and Technology					
Forms of Teaching and Learning	Face to Face					
Course Type	**Compulsory**	**X**	**Elective**			
Objectives	This module provides the basic knowledge of fluid mechanics required for the energy science and the ability to apply it in simple engineering-practical applications.					
Content	Fluid properties, hydrostatic, flow kinematics and kinetics, conservation laws (control volume, Euler, Navier-Stokes, Reynolds), potential, groundwater and boundary layer flows, pipe and channel flows, flow forces, similarity theory					
Prerequisites	None					
Coordinator						
Lecturer(s)						
Assistant(s)						
Work Placement	No					

Recommended or Required Reading	
Books / Lecture Notes	● Çengel, Y.A., Cimbala, J.M., 2004, Fluid Mechanics, McGraw Hill. ● Leopold Böswirth, 1993, Technische Strömungslehre Lehr- und Übungsbuch, Sabine Bschorer Wiesbaden Springer Verlag 2014.
Other Sources	

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition		
Mathematics und Basic Sciences		%
Engineering	60	%
Engineering Design	40	%
Social Sciences		%

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Educational Sciences		%
Natural Sciences		%
Health Sciences		%
Expert Knowledge		%

Assessment

Activity	Count	Percentage (%)
Midterm Exam	2	%40
Quiz		
Assignments		
Attendance		
Recitations		
Projects		
Final Exam	1	%60
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	13	3	39
Self-Study	14	7	98
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	2	3	6
Recitations	14	2	28
Laboratory			
Projects			
Final Exam	1	3	3
		Total Work Load	**174**
		ECTS Points (Total Work Load / Hours)	**6**

Learning Outcomes

1	Student learns the flow movement
2	Students can apply fluid mechanics in simple engineering-practical structures.

Weekly Content

1	Fundamentals of Fluid Mechanics
2	Properties of Fluids
3	Pressure and Fluid Statics
4	Fluid Kinematics

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5	Mass, Bernoulli and Energy Equations
6	Momentum Analysis of Flow Systems
7	Dimensional Analysis and Modeling
8	Midterm
9	Flow in Pipes
10	Differential Flow Analysis
11	Approximate Solutions of the Navier-Stokes Equation
12	External Flow: Resistance and Lift
13	Compressible flow
14	Open channel flow and Turbomachinery
15	Final exam

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7
1	5	4	3	4	4	5	1
2	5	5	5	5	5	3	1

Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

P1 Working with modern scientific sources.
P2 Having modern scientific knowledge and scientific analysis abilities and being able to apply them to scientific problems.
P3 Having theoretical and practical skills in the area of Energy Science and Technology.
P4 Having foreign language skills to follow the worldwide advancements in the field of Energy Science and Technology and to be able to discuss them with foreign colleagues.
P5 Having computational skills for research data analysis purposes.
P6 Having appropriate skills for academic and industrial jobs, being ready to take responsibility in working life.
P7 Having knowledge about work occupational work and safety.

Compiled by:	Res Asst. Elvan Burcu Kosma
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