OSTIM TECHNICAL UNIVERSITY
FACULTY OF ENGINEERING

COURSE SYLLABUS FORM
2021-2022

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MEC 305 Fluid Mechanics							
Course Name	**Course Code**	**Period**	**Hours**	**Application**	**Laboratory**	**Credit**	**ECTS**
FLUID MECHANICS	MEC 305	1	3	0	0	4	5

Language of Instruction	English
Course Status	Compulsory
Course Level	Bachelor
Learning and Teaching Techniques of the Course	Lecture, Discussion, Question Answer, Practice

Course Objective

To give the ability of developing fluid mechanics equations in integral and differential forms to students and to build the understanding of basic fluid-solid interactions.

Learning Outcomes

A successful student of this course,

1. Has knowledge about the basic fluid properties and the fundamental concepts of fluid mechanics.
2. Can derive and apply the fundamental equation of fluid statics and determine the hydrostatic force acting on immersed surfaces.
3. Can derive and apply the conservation equations of mass, momentum, energy and angular momentum in integral form.
4. Can analyze incompressible flow in pipes and closed conduits.

Course Outline
Introduction fundamental concepts and fluid properties. Description and classification of fluid motion. Fluid statics. Buoyancy and stability. Concepts of system and control volume. Derivation and application of flow equations in integral and differential forms. Laminar and turbulent flows in pipes and ducts, major and minor losses. Turbomachinery.

Weekly Topics and Related Preparation Studies		
Weeks	Topics	Preparation Studies
1	Fundamental Concepts	
2	Fluid Statics	
3	Integral Equations of Fluid Mechanics	
4	Integral Equations of Fluid Mechanics	
5	Differential Equations of Fluid Mechanics	
6	Differential Equations of Fluid Mechanics	
7	Differential Equations of Fluid Mechanics	
8	Incompressible Inviscid Flow	
9	Incompressible Inviscid Flow	
10	Internal and External Incompressible Viscous FLow	
11	Internal and External Incompressible Viscous FLow	
12	Internal and External Incompressible Viscous FLow	
13	Fluid Machinery	
14	Fluid Machinery	

Textbook(s)/References/Materials:
Fox, R. W., McDonald, A. T., & Mitchell, J. W. (2020). Fox and McDonald's introduction to fluid mechanics. John Wiley & Sons.

Assessment		
Studies	**Number**	**Contribution margin (%)**
Attendance	14	10
Lab		
Application		
Field Study		
Course-Specific Internship (if any)		
Quizzes / Studio / Critical	2	20
Homework		
Presentation		
Projects		
Report		
Seminar		
Midterm Exams / Midterm Jury	1	30
General Exam / Final Jury	1	40
	Total	**100**
Success Grade Contribution of Semester Studies		60
Success Grade Contribution of End of Term		40
	Total	**100**

Relationship Between Course Learning Outcomes and Program Competencies							
#	**Learning Outcomes**	**Contribution Level**					
		1	**2**	**3**	**4**	**5**
1	An ability to apply knowledge of science, mathematics, and engineering.					x
2	An ability to design static systems, components, or processes to meet industrial needs.					x
3	An ability to work with multi-disciplinary teams.					x
4	An ability to identify, formulate, and solve engineering problems.					x
5	Take responsibility to solve unpredictable and complex problems encountered in applications as an individual and as a member of a team			x		
6	Plan and manage activities in teamwork			x		
7	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.				x	
8	Can do research on interdisciplinary fields.			x		

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Course hours (Including the exam week: 16 x total course hours)	16	3	48
Laboratory			
Application			
Course-Specific Internship			
Field Study			
Study Time Out of Class	14	2	28
Presentation / Seminar Preparation			
Projects			
Reports			
Homeworks			
Quizzes / Studio Review	5	2	10
Preparation Time for Midterm Exams / Midterm Jury	1	15	15
Preparation Period for the Final Exam / General Jury	1	15	15
Total Workload			**116**