Course Description Form	
Course Code and Name	ME301 Fluid Mechanics I
Course Semester	5
Catalog Content	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 basic equations in integral form for a control volume. Laminar and turbulent flows in pipes and ducts, major and minor losses.
Textbook	1) Introduction to Fluid Mechanics, R. W. Fox, P. J. Pritchard and A. T. McDonald, John Wiley & Sons, Inc. 2) Introduction to Fluid Mechanics, D. F. Young, B. R. Munson, T. H. Okiishi and W.W. Huebsch, John Wiley & Sons, Inc.
Supplementary Textbooks	1) Mechanics of Fluids, M. C. Potter and D. C. Wiggert, Prentice Hall.
Credit	5
Prerequisites of the Course (Attendance Requirements)	
Type of the Course	Compulsory
Instruction Language	English
Course Objectives	To introduce basic properties and importance of fluids in engineering applications. To teach and apply basic methods employed for analysis of engineering problems involving fluids.
Course Learning Outcomes	1. Has knowledge about the basic fluid properties and the fundamental concepts of the 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.
Instruction Methods	The modes of delivery of this course are face to face & laboratory.
Weekly Schedule	1. Week INTRODUCTION: Definition of fluid, fluid mechanics in engineering, scope of fluid mechanics, methods of analysis, dimensions and units. 2. Week FUNDAMENTAL CONCEPTS: Definition of continuum, fluid as a continuum, velocity field, timeline,pathline, streakline and streamline. Stress field. EXPERIMENT I 3. Week FUNDAMENTAL CONCEPTS: Viscosity, Newtonian and non-Newtonian fluids, vapor pressure and surface tension, description and classification of fluid motion. 4. Week FLUID STATICS: The basic equation of fluid statics, analysis of hydrostatic force on plane submerged surfaces. 5. Week FLUID STATICS: Analysis of hydrostatic force on curved submerged surfaces. Buoyancy and stability. 6. Week FLUID STATICS: Analysis of fluids in rigid-body motion. 7. Week BASIC EQUATIONS FOR A SYSTEM: Conservation of mass, momentum, moment of momentum and energy equations.

	8. Week I. Midterm. BASIC EQUATIONS FOR A SYSTEM: Conservation of mass, momentum, moment of momentum and energy equations. EXPERIMENT II 9. Week BASIC EQUATIONS IN INTEGRAL FORM: Derivation of Reynolds transport equation. Derivation and application of conservation of mass and momentum equation. 10. Week BASIC EQUATIONS IN INTEGRAL FORM: Derivation and application of moment of momentum and conservation of energy equations for a control volume. 11. Week ANALYSIS OF INTERNAL INCOMPRESSIBLE FLOW: Derivation of extended Bernoulli equation. Calculation of major and minor head losses. 12. Week ANALYSIS OF INTERNAL INCOMPRESSIBLE FLOW: Flow analysis in serial system of pipes, flow analysis in parallel system of pipes. 13. Week II. Midterm. ANALYSIS OF INTERNAL INCOMPRESSIBLE FLOW: Analysis of pipe networks, analysis of interconnected reservoir systems. 14. Week ANALYSIS OF INTERNAL INCOMPRESSIBLE FLOW: Analysis of pipe networks, analysis of interconnected reservoir systems. 15. Week FINAL EXAM
Teaching and Learning Methods *(These are examples. Please fill which activities you use in the course)*	Weekly theoretical course hours: 3 Weekly applied course hours: 0 Reading Activities: 3 Internet browsing, library work: 3 Designing and implementing materials: 0 Report preparing: 5 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 10 Final Exam and Preparation for Final Exam: 12
Assessment Criteria	

	Numbers	**Total Weighting (%)**
Midterm Exams	2	45
Assignment	4	0
Application	2	5
Projects	0	0
Practice	0	0
Quiz	2	10
Percent of In-term Studies (%)		60
Percentage of Final Exam to Total Score (%)		40
Attendance		0

Workload

Activity	**Total Number of Weeks**	**Duration (weekly hour)**	**Total Period Work Load**
Weekly Theoretical Course Hours	14	3	42
Weekly Tutorial Hours			0
Reading Tasks	7	3	21
Studies	7	3	21
Material Design and Implementation			0
Report Preparing	2	5	10

Preparing a Presentation			0	
Presentations			0	
Midterm Exam and Preperation for Midterm Exam	2	10	20	
Final Exam and Preperation for Final Exam	1	12	12	
Other (should be emphasized)			0	
Total Workload			126	
Total Workload / 25			5,04	
Course Credit (ECTS)			5	

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge of subjects specific to mathematics, natural sciences and related engineering disciplines; ability to use theoretical and applied knowledge related to these areas in complex engineering problems.				X	
2	Ability to identify, define, formulate, and solve complex engineering problems; ability to select and apply appropriate analysis and modeling methods to this end.				X	
3	Ability to design a complex system, process, device or product under realistic constraints and conditions to meet specific requirements; ability to apply modern design methods for this purpose.	X				
4	Ability to develop, select and use modern techniques and tools required for the analysis and solution of complex problems encountered in engineering practice; ability to use information technologies effectively.			X		
5	Ability to design and conduct experiments, collect data, analyze and interpret results to investigate complex engineering problems or discipline-specific research topics.					
6	Ability to work effectively in disciplinary and multi-disciplinary teams; ability to work individually.					
7	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of at least one foreign language; the ability to write effective reports and understand written reports, to prepare design and production reports, to deliver effective presentations, to give and receive clear and understandable instructions.					
8	Awareness of the necessity of lifelong learning; the ability to access information, to follow developments in science and technology, and to renew oneself constantly.					
9	Acting in accordance with ethical					

		principles, professional and ethical responsibility; information about standards used in engineering applications.						
	10	Information about business life practices such as project management, risk management and change management; awareness of entrepreneurship, innovation; information about sustainable development.						
	11	Knowledge about the universal and social effects of engineering applications on health, environment and safety and the problems of the age reflected in the engineering field; awareness of the legal consequences of engineering solutions.						
The Course's Lecturer(s) and Contact Informations	1. Prof. Dr. Nuri YÜCEL nuyucel@gazi.edu.tr 2. Assist. Prof. Dr. Nureddin DİNLER ndinler@gazi.edu.tr							