HASAN KALYONCU UNIVERSITY
Faculty of Engineering
Course Description Form

COURSE: Fluid Mechanics				
CODE: CE272	**SEMESTER:** SPRING			
LANGUAGE: ENGLISH	**TYPE:** COMPULSORY			
PRE-REQUISITES: - **CO-REQUISITES: -**	**THEORY**	**PRACTICAL**	**CREDIT**	**ECTS**
WEEKLY HOURS: 3	3	0	3	4

CONTENT OF THE COURSE:
This course gives the fundamental principles of fluid mechanics and their application to engineering problems and includes the study of behavior of viscous and non-viscous fluids at rest and in motion through development and application of the principles of fluid statics, continuity, energy, momentum, similitude, and dimensional analysis. The topics covered in this course throughout the semester include fluid statics; kinematics of fluid flow: continuity equation, stream function, ir-rotational flow velocity potential; fluid dynamics: flow of viscous fluids; newtonian fluids, simple laminar flow systems, turbulence, flow in pipes as well as selected subjects from compressible flow, open channel flow, boundary layer theory.

OBJECTIVE OF THE COURSE:
To enable students to know the fundamentals of Engineering fluid mechanics and hydraulics. As well as to know how to deal with its problems in civil engineering.

WEEKLY SCHEDULE	
Week	**Topics**
1	Introduction about fluid mechanics
2	Fluid properties
3	Pressure types and how to measure it.
4	Hydrostatic forces, buoyancy and stability
5	Fluid kinematics
6	Continuty equation and Bernoulli’s equation
7	Pitot tubes, Venturi meter pipes and orifices
8	Midterm Exam
9	Momentum equation and its application
10	Force exerted by a jet striking a flat plate
11	Analysis of flow in pipelines
12	Introduction to Energy loss in pipe flows
13	Design of pipeline diameter and flow rate
14	Steady flow and piping networks system

TEXTBOOK: Applied Fluid Mechanics, 7th edition, 2014 by Robert Mott and Joseph Untener
REFERENCE BOOKS

Fluid Mechanics, 2008 by Merle Potter and David Wiggert.

EVALUATION SYSTEM:		
IN-TERM STUDIES	**QUANTITY**	**PERCENTAGE (%)**
Midterm Exam	1	35
Homework	3	15
Laboratory works	0	-
Quiz	2	10
Final Exam	1	40
TOTAL	7	100
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	6	60
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	40
TOTAL	7	100

COURSE CATEGORY:	**PERCENTAGE (%)**
Mathematics and Basic Sciences	40
Engineering	45
Engineering Design	15
Social Sciences	

TABLE OF ECTS / WORKLOAD:			
Activities	**QUANTITY**	**Duration (Hour)**	**Total Workload**
Course Duration	13	3	39
Hours for off-the-classroom study (Pre-study, practice)	14	3	42
Laboratory works	0	0	0
Mid-term	1	2	2
Final examination	1	2	2
Homework	3	3	9
Quiz	2	0.5	1
Total Work Load	34	13.5	**95**
Total Work Load / 30			**3.16**
ECTS Credit of the Course			**4**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
LO1	3	2	0	2	0	0	0	0	0	0	0
LO2	3	2	0	2	0	0	0	0	0	0	0
LO3	3	2	0	2	0	0	0	0	0	0	0
LO4	3	2	0	2	0	0	0	0	0	0	0
	PO: Program Outcomes | LO: Learning Outcomes Values: 0: None | 1: Low | 2: Medium | 3: High										

INSTRUCTOR(S):	Asst.Prof.Dr. H.Çağan Kılınç
FORM PREPARATION DATE:	22.05.2019

LEARNING OUTCOMES OF THE COURSE:	**PROGRAM OUTCOMES:**
LO1: Define basic terms, values and laws in the area of fluids properties, statics, kinamatics and dynamics of fluids. LO2: Describe methods of implementing fluid mechanics laws and phenomena while analysing the operational parameters of hydraulic problems, systems and machines. LO3: Calculate and optimise operational parameters of hydraulic problems, systems and machines. LO4: Select engineering approach to problem solving based on the acquired physics and mathematical knowledge.	**PO1:** Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems. **PO2:** Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. **PO3:** Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. **PO4:** Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively. **PO5:** Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions. **PO6:** Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually. **PO7:** Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions. **PO8:** Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself. **PO9:** Consciousness to behave according to ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice. **PO10:** Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship,

	innovation; knowledge about sustainable development. **PO11:** Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.