İZMİR KÂTİP ÇELEBI UNIVERSITY FACULTY OF ENGINEERING ARCHITECTURE MECHANICAL ENGINEERING DEPARTMENT	**Form No:** FRM-1
	First Pub Date: 15/11/2016
	Rev. No/Date: 25/01/2017

DESIGN PROJECT PROPOSAL FORM

Academic Year	**2022-2023**	**Semester**	~~Fall •~~ Spring ☑
Project Type	**Research** ~~• ME 411 Thermal & Fluid Design~~ ~~• ME 413 Mechanical Design~~ ~~• ME 415 Robotics & Control Design~~	**Application** ☑ ME 412 Thermal & Fluid Design • ME 414 Mechanical Design • ME 416 Robotics & Control Design	
Advisor	Asst. Prof. Dr. Umut Ceyhan		

Project Title	Deformation of drops under shear flow
Purpose and Scope	This project aims to analyze deformation of partially/non-wetting drops under the action of shear flow. The analysis requires the development of a two-phase flow solver using finite element method and understanding the dynamics of drop deformation with possible control mechanisms.
Work Packages	(a) Literature study on drop deformation under shear flows and multi-phase flows (b) Development of a solver to integrate the model equations (c) Validation of the solver (d) Analysis of the deformation
# of Team Members	1-2
This section will be filled by the Commission	The Project Proposal ☐ fulfills the regulations of the Department ☐ should be revised according to the following suggestions:

The projects are aimed to prepare students to attain the following program educational objectives:
(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(d) an ability to function on multidisciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Therefore, the final report of the project should contain the followings:

i. Definition of the design problem and its limitations
ii. Theoretical information about the topic, standards and patents
iii. Different design options and selection criteria
iv. Optimal solution with appropriate selection criteria
v. Cost accounting, feasibility, compliance with regulations and standards, environmental impacts, and compliance with ethical rules
vi. Engineering drawing and presentation methods for presenting