



### DESIGN PROJECT PROPOSAL FORM

<b>Academic Year</b>	<b>2022 -2023</b>	<b>Semester</b>	Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/>
<b>Project Type</b>	<b>Research</b> <input type="checkbox"/> ME 411 Thermal & Fluid Design <input type="checkbox"/> ME 413 Mechanical Design <input checked="" type="checkbox"/> ME 415 Robotics & Control Design	<b>Application</b> <input type="checkbox"/> ME 412 Thermal & Fluid Design <input type="checkbox"/> ME 414 Mechanical Design <input checked="" type="checkbox"/> ME 416 Robotics & Control Design	
<b>Advisor</b>	Asst.Prof.Dr.Çağlar UYULAN		
<b>Project Title</b>	Identification, Learning, and Control in Robotic Systems		
<b>Purpose and Scope</b>	The research focuses on cyber-physical systems for robotic manipulators with the specific goal of achieving: 1) trajectory tracking controller design, 2) methods for integrating, identification, planning, control and learning with the nonlinear dynamical system, and 3) developing integrated physical manifestations with sensing, actuation, and computation necessary to realize the robotic manipulation (3 DOF is preferable)		
<b>Work Packages</b>	<ul style="list-style-type: none"><li>• Dynamical Modeling of a Robotic Manipulator</li><li>• Identification of Dynamics Model</li><li>• Controller Design and Implementation</li><li>• Path Planning, Parameter Tuning</li><li>• Experimental Realization</li></ul>		
<b># of Team Members</b>			
<b>This section to be filled by the Commission</b>	The Project Proposal <input type="checkbox"/> is approved. <input type="checkbox"/> should be revised considering 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 following:

- 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