



DESIGN PROJECT PROPOSAL FORM

Academic Year	2022 -2023	Semester	Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/>
Project Type	Research <input type="checkbox"/> ME 411 Thermal & Fluid Design <input type="checkbox"/> ME 413 Mechanical Design <input checked="" type="checkbox"/> ME 415 Robotics & Control Design	Application <input type="checkbox"/> ME 412 Thermal & Fluid Design <input type="checkbox"/> ME 414 Mechanical Design <input checked="" type="checkbox"/> ME 416 Robotics & Control Design	
Advisor	Asst.Prof.Dr.Çağlar UYULAN		
Project Title	Multi-purpose Tactical UAV Design and Manufacturing		
Purpose and Scope	<p>In this study, the mechanical design, simulations, and manufacturing of micro class fixed-wing tactical unmanned aerial vehicles designed to be used in various missions will be done. National and international competitions have been decisive in determining the design requirements. The designed vehicle has a maximum take-off weight of 3.5 kg and a payload of 0.5 kg. The wingspan of the vehicle is 1.4 m, the flight duration is 20 minutes, the cruising speed is 20 m/s, the duty altitude is between 5-50 m depending on the equipment used. It has the features of autonomously identifying coloured ground targets, landing and taking off, returning to the starting point in case of signal loss or low battery.</p>		
Work Packages	<ul style="list-style-type: none">• Mechanical Design, Configurations, Weight Estimation (Initial)• Wing Profile Selection• Thrust-Weight Ratio and Wing Loading Evaluations• Dimensionalization• Aerodynamic Calculations• Motor and Battery Selection• Detailed Design• Modelling and Simulation, CFD Analyzes• Manufacturing Process		
# of Team Members			
This section to be filled by the Commission	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