	T.R. **İZMİR KÂTİP ÇELEBİ UNIVERSITY** **FACULTY OF ENGINEERING AND ARCHITECTURE** **MECHANICAL ENGINEERING DEPARTMENT**	**Form No:** FRM-1 **First Pub Date:** 15.11.2016 **Revision Date:** 15.02.2017

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	Assoc.Prof.Dr.Sercan ACARER		

Project Title	Design and rapid prototyping (3D printer) test of high speed hydrostatic bearings for additively printed micro gas turbine applications
Purpose and Scope	The purpose of this undergraduate project is to design, fabricate, and test high-speed hydrostatic bearings for additively printed micro gas turbine applications using rapid prototyping techniques. The goal of this project is to investigate the feasibility of using 3D printing technology to produce high-performance hydrostatic bearings that can be used in micro gas turbines.
Work Packages	• Literature review: Conduct a comprehensive review of the existing literature related to the design and fabrication of hydrostatic bearings, as well as the use of 3D printing technology for producing these bearings. • Design of hydrostatic bearings: Based on the literature review, design hydrostatic bearings suitable for high-speed micro gas turbine applications. The design should consider factors such as load capacity, stiffness, and damping. • Rapid prototyping: Use 3D printing technology to rapidly fabricate the designed hydrostatic bearings. Investigate the effect of different 3D printing parameters (e.g., layer height, infill density, printing speed) on the performance of the bearings. • Bearing performance testing: Conduct performance tests on the fabricated hydrostatic bearings to evaluate their load capacity by monitoring achieved rpm. • Analysis and interpretation of results: Analyze the experimental results and interpret the findings. Discuss the limitations of the study and suggest future research directions. The work will follow the procedures described in the attached scientific paper: https://asmedigitalcollection.asme.org/gasturbinespower/article-abstract/144/12/121010/1145924/Design-Methodology-and-Concept-Demonstration-of
# of Team Members	1 student

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This section to be filled by the Commission	The Project Proposal ☐ is approved. ☐ should be revised considering the following suggestions: