**DESIGN PROJECT PROPOSAL FORM**

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| **Academic Year** | **2019 -2020** | **Semester** | | FallSpring**X** |
| **Project Type** | **Research** | | **Application** | |
| ME 411 Thermal & Fluid Design | | ME 412 Thermal & Fluid Design | |
| ME 413 Mechanical Design | | **X**ME 414 Mechanical Design | |
| ME 415 Robotics & Control Design | | ME 416 Robotics & Control Design | |
| **Advisor** | Prof. Dr. Buket OKUTAN BABA | | | |

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| **Project Title** | **Mechanical Analysis of Sandwich Composite Structures Containing Auxetic Re-entrant and Chiral Core** |
| **Purpose and Scope** | The aim of this study is to design a sandwich composite with auxetic re-entrant and chiral core and compare these structures in terms of their mechanical properties. |
| **Work Packages** | * In this study, a sandwich composite with auxetic re-entrant and chiral core will be designed in different shapes and sizes using CAD / FEM finite element package programs. * Then, re-entrant and chiral structure will compared to determine Poisson's ratio and mechanical properties. |
| **# 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:

1. Definition of the design problem and its limitations
2. Theoretical information about the topic, standards and patents
3. Different design options and selection criteria
4. Optimal solution with appropriate selection criteria
5. Cost accounting, feasibility, compliance with regulations and standards, environmental impacts, and compliance with ethical rules
6. Engineering drawing and presentation methods for presenting