**DESIGN PROJECT PROPOSAL FORM**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 | | | |

|  |  |
| --- | --- |
| **Project Title** | **Determination of Optimum Dimensions of Auxetic Core Structure Used in Sandwich Composites** |
| **Purpose and Scope** | The aim of this study is to design a sandwich composite with auxetic chiral cores at different sizes and optimum dimensions using CAD / FEM finite element package programs to obtain minimum Poisson ratio and to manufacture this design. |
| **Work Packages** | * In this study, students will be able to design a sandwich composite with a different auxetic chiral core using finite element package programs and determine the optimum dimensions to obtain the minimum Poisson ratio using FEM software. * Then optimum design will be manufacture with 3D printer using PLA and ABS materials to determine its mechanical properties experimental and numerically. |
| **# 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