| Project Title | Advisor | Project Description | Requirements | Number of Students |
|---|---|---|---|---|
| Designing a Heat Pump System for the Güzelbahçe Campus | Prof.Dr. F. Görkem Üçtuğ | Students will perform the technical and economic analysis of using solar-powered heat pump system for residential heating in Güzelbahçe campus of our university. | ME 304, ME 201, MS Excel, any coding language | 3 |
| Building Thermal Retrofit | Prof.Dr. F. Görkem Üçtuğ | Students will perform the technical and economic analysis of retrofitting a building with insulation and solar power to improve its energy efficiency | ME 304, ME 201, MS Excel, any coding language | 3 |
| Planetary Gearbox Mechanism | Prof. Dr. Hakkı Eskicioğlu | Students will produce a planetary gear system used in parallel hybrid cars for demonsration in ME 308 course. | ME 308 | 3 |
| 3 Speed Gearbox Mechanism | Prof. Dr. Hakkı Eskicioğlu | Students will design and manufacture 3 Speed Gearbox for demonstration in ME 308 course | ME 308 | 3 |
| Design and Prototype a Low-Cost, Portable Water Purification System | Prof. Dr. Hakkı Eskicioğlu | Students will create a compact and affordable water purification system for use in remote or disaster-stricken areas. | ME 308 | 3 |
| CPR Machine Design with Integrated Sensors and Actuators | Prof.Dr.L.Canan Dülger | Previously designed CPR machine will be integrated with sensors and actuators. A prototype will be completed and operated. | ME 309-ME 314-Matlab | 4 |
| A Simulation Based Control Study on a Hybrid Press Mechanism | Prof.Dr.L.Canan Dülger | Previously designed hybrid Press Mechanism will be controlled using PID and simulated | Matlab-ME 314-SimScape | 3 |
| Force-Curve Analysis of Nanofilms Composed of 2D Inorganic Nanomaterials with Layer Variations | Assoc. Prof. Ozge Saglam | This project aims to investigate the mechanical properties of nanofilms composed of 2D inorganic nanomaterials with varying layer thicknesses through force-curve measurements. The study will focus on understanding the relationship between layer variations and the mechanical response of these films, contributing to their potential applications in advanced nanotechnologies | ME 202, Excel, Matlab | 2 |
| Temperature Effect on the Removal of Chemical Exfoliation Agents from Inorganic Nanofilms | Assoc. Prof. Ozge Saglam | This project focuses on examining how temperature impacts the removal of chemical exfoliation agents from inorganic nanofilms. The study aims to optimize the removal process to enhance the structural and functional properties of the nanofilms for advanced applications. | ME 202, Excel, Matlab | 2 |
| Improving the Mechanical Properties of an 7075 Al Alloy Mechanical Part | Asst. Prof. Dr. Yiğit Erçayhan | Students will design any mechanical part that they want and will apply mechanical analysis and will improve 7075 Al alloy mechanical properties by heat treatment processes. | ME 202, ME 208, ME 211 | 3 |

| Project Title | Advisor | Description | Prerequisites | Students |
|---|---|---|---|---|
| The Effects of Strain Rate on Mechanical Properties in Tension of Aluminum Alloy. | Asst. Prof. Dr. Yiğit Erçayhan | Students will prepare tensile test specimens of aluminum alloy and execute a series of tensile tests. Then they will conduct structural analysis with the same test specimens and compare the results. | ME 202, ME 208, ME 211 | 3 |
| Vibration Measurement Set-up Design and Validation | Asst. Prof. Dr. Umut Tabak | Students will design a vibration measurement setup for the demonstrations in ME 425 and ME 522 courses | ME 211, ME 206, Prefarably coding in MATLAB/Python, ME 422 and ME 425(these two prerequisites are nice to have but not a must) | 2 |
| Designing Efficient Interface Reduction Methods for Vibro-Acoustic Model Reduction Techniques | Asst. Prof. Dr. Umut Tabak | Students will investigate different interface reduction techniques used for structural problems and, with the help and guidance of the instuctor, they will try to extend these methods to systems with vibro-acoustic coupling | ME 211, ME 206, Prefarably coding in MATLAB/Python, ME 422 and ME 425(these two prerequisites are nice to have but not a must) | 2 |
| Designing a Numerical Test Platform with Petsc4Py for Iterative Solution of Linear System of Equation | Asst. Prof. Dr. Umut Tabak | Students will learn and pratice heavily with Python language by using Petsc4Py interface. They will create an interface for the solution of linear systems iteratively. | ME 211, ME 206, Prefarably coding in MATLAB/Python, ME 422 and ME 425(these two prerequisites are nice to have but not a must) | 2 |
| Designing and Testing Different Tuned Vibration Absorvers for Vibration Transfer Reduction in 2D Truss Structures | Asst. Prof. Dr. Umut Tabak | Tuned vibration absorbers are heavily used for vibration mitigation in structural systems. The students will investigate current, state of the art, tuned vibration absorber designs and come up with a new design that can be used on truss structures | ME 211, ME 206, Prefarably coding in MATLAB/Python, ME 422 and ME 425 | 2 |
| Numerical Modeling of Arc Welding Method and Experimental Validation of This Model | Lecturer Dr. Murat Türkan | Students will model arc welding method with a finite element analysis software. They will also perform an experimental welding process accordance with this model. They will compare the temperature measured with the termocouples in the experimental study with the temperature obtained from the created numerical model and verify the model. | SE 113, ME 202, ME 203, ME 304, MS Excel, ABAQUS | 3 |
| Design and Manufacture of a Rowing Device for Sports Purposes. | Lecturer Dr. Murat Türkan | Students will design and manufacture a rowing device for sports purposes. | ME 202, ME 203, ME 208, ME 307, ME 308, ABAQUS | 2 |