**Graduation Project Proposal**

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| Project Title | Design and Analysis of a Power Plant |
| Classification | Design and Analysis |
| Supervisor | Mehmet Kanoğlu |
| Abstract | Most of the world’s electricity are produced from power plants operating on some kinds of thermodynamic cycles. In a fossil-fuel power plant, the combustion of coal, natural gas and oil produce thermal energy which in turn isa converted to work. Steam power plants use water as the working fluid and gas turbine power plant involve working fluid in gas state. There are also renewable energy based power plants including geothermal and solar thermal power plants. In this project, a group of students will work on design and analysis of a steam power plant. If needed, a different type of power plant may also be considered. The conditions for the design of power plant are as follows: Design and analyze a steam power cycle for a power output of 50 MW that can achieve a cycle thermal efficiency of at least 40% under the conditions that all turbines have isentropic efficiencies of 90% and all pumps have isentropic efficiencies of 75%. The plant utilizes open feedwater heater(s) and driven by a natural gas boiler system whose efficiency is 90 percent. The work will be done by hand calculations as well as by appropriate software. In the second part of the Project the group will analyze an existing power plant using actual plant data. All work will be documented on a regular basis and a final report will be prepared.  |

The graduation project is the subject of the MEC 401 Mechanical Engineering Design and MEC 402 Graduation Project courses offered in the 7th and 8th semesters, respectively.

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| Course Name | MEC 401 Mechanical Engineering Design |
| Prerequisites | MEC 205 Thermodynamics I, MEC 206 Thermodynamics II |
| Corequisites | - |
| Requirements | - |
| Workflow | * Literature survey
* Selection of cycle and its components
* Energy analysis
* Exergy analysis
* Software application
* Project report
* Final presentation
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| --- | --- |
| Course Name | MEC 402 Graduation Project |
| Prerequisites | MEC 401 Mechanical Engineering Design |
| Corequisites | - |
| Requirements | - |
| Workflow | * Selection of power plant
* Obtaining actual operational data of the plant
* Energy and exergy analysis
* Software application
* Project report
* Final presentation
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| Term | Fall 2024 |
| Date |  |
| Project Title | Design and Analysis of a Power Plant |
| Supervisor Name and Signature | Mehmet Kanoğlu |
| Students |
| First Name | Last Name | Student Number | Signature |
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