**Graduation Project Proposal**

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| Project Title | Design optimization of a vertical-axis wind turbine for maximum efficiency |
| Classification | Research project |
| Supervisor | Fatih DARICIK |
| Abstract | Vertical-axis wind turbines (VAWTs) are small and lightweight electric generators that need less maintenance. VAWTs are independent of the wind direction and can operate at wind speeds lower than are needed for horizontal axis wind turbines. VAWTs are suitable for the utilization of wind energy in urban areas. The goal of this project is to determine the optimum geometrical parameters of VAWT blades for maximum efficiency. |

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 104 Computer Aided Technical Drawing  MEC 301.2 Computer Aided Structural Analysis, |
| Corequisites | None |
| Requirements | Basic knowledge of solid modeling software and a finite element analysis software |
| Workflow | * Literature survey * Defining design criteria * Analytical calculations * Geometrical design studies * Midterm presentation * CFD analysis of a model * FSI analysis of a model * Project report * Final presentation |

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| Course Name | MEC 402 Graduation Project | | | |
| Prerequisites | MEC 304 Machine Elements III  MEC 401 Mechanical Engineering Design | | | |
| Corequisites | None | | | |
| Requirements | Basic knowledge of laboratory applications and occupational health&safety | | | |
| Workflow | * Manufacturing Studies * Assembly of the designed system * Experimental measurements * Midterm presentation * Observation of long-term performance * Project report * Final presentation | | | |
| Term | |  | | |
| Date | |  | | |
| Project Title | |  | | |
| Supervisor Name and Signature | |  | | |
| Students | | | | |
| First Name | | Last Name | Student Number | Signature |
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