

Aviation Design – Early Design Exposure for Students by Students

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Extended Abstract

A student-organization-created design course for freshmen and sophomores that supports an interest for participation and early exposure to capstone-type engineering design. Aviation Design is a two-semester project-based course conceived by students that provides incoming engineering students the opportunity to design, draft, and construct a remote controlled aircraft from scratch. Will knowledge of experience many freshman and sophomores have there is no required experience needed to participate in this project. Teams of four to five student participants cooperate to create and optimize an aircraft. These aircraft are eventually tested to outperform the other teams in three various missions. Based on an organized syllabus constructed by the student organization leads, the two-semester course not only features mentoring by senior undergraduate students but also includes technical presentations by faculty and industry experts. Students are introduced to the fundamental forces in aviation and how to design an aircraft structure to withstand stresses on the aircraft during flight. They are given the opportunity to participate in a software workshop designed by student instructors, create a CAD model of their entire aircraft and also construct a small portion of their wing for wind tunnel testing. In the following semester, participants construct their aircraft with the materials provided. After construction, all teams compete with their aircraft in a set of missions. Finally, participants are given the opportunity to use the data and observations from this project to write a technical publication about the design of their aircraft. This paper outlines positive student outcomes observed in learning, mentor-ship and professional development achieved both by the participants as well as the student-initiators.