FIU | FLORIDA INTERNATIONAL UNIVERSITY

SENIOR DESIGN ORGANIZATION SYNOPSIS – SPRING 2014

PanthAir Cargo: SAE International Aero Design Brazil 2014

Team 6: Andres Cardenas, Arjav Patel and Nestor Paz

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The SAE Aero Design series competition provides engineering students with an opportunity to face real-life engineering challenges by designing, building and flying a remote control aircraft within a given set of parameters. The competition scores each team on the accuracy, completeness and the oral presentation of their report, the structural integrity and reliability of their aircraft, and their flying performance in the completion. In order to be successful in this effort, it is necessary for each team to apply their technical knowledge of the aerospace field as well as effectively utilize their oral and interpersonal communications and report writing skills.

The competition will be held in São José dos Campos, Brazil from 30 October to 2 November 2014. Ninety five university teams will compete in three different classes: Micro, Regular and Advanced. Ten slots are reserved for international teams, and we hope to secure a slot for us to represent FIU on this international stage. We plan on competing in the Regular Class. The objective of the Regular Class competition is to design a remote controlled cargo aircraft, accurately predict the aircraft's payload capacity in our report, and then perform in the actual flight competition where the objective is for the airplane to lift as much payload as possible within the given parameters.

The aircraft's wings, fuselage, and empennage are to be unique and entirely designed and constructed. The aircraft's geometric and weight measurements must stay within the given parameters. Components such as the electronics, engine, propeller and landing gear can be purchased as long as they also conform to the given parameters of the competition.

The team has researched different design alternatives to select the best option while considering many factors including flight stability, performance, cost and manufacturability. Our design will be optimized as much as possible using computational fluid dynamic (CFD) analysis and optimization to maximize lift and minimize drag. We will validate the optimized results using wind tunnel testing. Our research will hopefully lead to improved future airplane designs.