**Project Background:**
The Aero Design competition is intended to provide undergraduate and graduate engineering students with a real-life engineering challenge. The competition has been designed to provide exposure to the kinds of situations that engineers face in their real-life work environment. First and foremost a design competition, students will find themselves performing trade studies and making compromises to arrive at a design solution that will optimally meet the mission requirements while still conforming to the configuration limitations.

**Goal:**
The goal of this project is to design and build a radio control aircraft which will be able to complete a successful run at the SAE Aero Design Competition with a total weight, weight of the aircraft and the payload, of thirty pounds.

**Objectives:**
The objectives of this project are:
- To be lightweight
- To be stable in flight
- To be able to land safely
- To carry the maximum possible weight
- To meet all SAE design requirements

**Wing:**
The airfoil shape, pictured above, was selected because it has a large coefficient of lift. This is due to the high camber, curvature, associated with the wing geometry. To ensure the wing is both strong and lightweight, a combination of Sitka spruce and balsa wood will be used, and structural analysis will be performed using the Autodesk Simulation software.

**Fuselage:**
The fuselage, pictured below, will be assembled using balsa wood to help keep the aircraft lightweight. A high wing configuration, one in which the wing is mounted on top of the fuselage, will be used so that the weight of the aircraft will act as a pendulum increasing the stability of the aircraft in flight.

**Landing Gear:**
A tail dragger configuration will be used for the landing gear. This type of configuration has two wheels under the front of the fuselage and one at the rear. A lightweight steel will be used for the structure and an elastic polymer will be used as a shock absorber. A drop test will be performed at the maximum loading to ensure the landing gear meets the design objectives.

**Team Members:**
- Matthew Fitzgerald
- Jeff Rinks
- Kevin Denson

**Faculty Advisor:**
- Dr. Doug Sterrett

**Performance**

In order to determine the amount of weight able to be lifted by the aircraft within the 200 ft takeoff limit, lift, drag, and thrust were calculated. Then, using an equation derived from the free body diagram of the aircraft on the runway, the weight lifting capabilities of the aircraft were estimated. Plots of the results can be found below.