

INTRODUCTION

This laboratory manual is intended for students taking Aeronautical Laboratory 1, or any similar course and is suitable for Aeronautical or Aerospace Engineering programs.

This laboratory manual contains two (2) pre-lab activities and five (5) experiments sufficient for an 18-week semester with a 3-hour laboratory period.

The included topics are familiarization with laboratory equipment and setup, Safety Orientation and Wind Tunnel Familiarization, Airflow Visualization, Calibration of 3D Balance, Test Section Calibration, Free Stream Turbulence, Drag Measurement, Wing and High Lift Device testing. The activities involved are: calibration & use of windtunnel software, lift & drag evaluation for short, sphere, circular ring, and teardrop shaped airfoils.

The experiments require the ff. lab equipment: subsonic windtunnel, fan speed controller, balance indicator, model airfoils, angular scale, and computer. Earmuff and goggles must also be worn during operation of the machine.

Windtunnels may or may not require software to completely function. It is important to check the features and refer to the manual of the equipment. Windtunnel which requires calibration should be monitored to prevent damage or inaccurate readings. Before using the equipment, please ensure that the operator has undergone the appropriate training.