First Course Handout

AE 351A Experiments in Aerospace Engineering (0-0-4-1-5) 2020-21 Semester II

Class hours – Friday 14.00 – 17.00

Instructors

Dr. Vaibhav Arghode (Propulsion)

Dr. Arun Kumar Perumal (Aerodynamics)

Dr. G.M. Kamath (Structures)

Course Objectives

This course aims to provide a hands-on experiential perspective of some of the topics covered in the lecture/theory-based courses.

Course Contents

S.No	Stream	Experiment
1	Structures	Uniaxial tensile testing
2	Structures	Torsion Testing
3	Structures	Beam Deflection and Strains
4	Structures	Principal Axes of Thin-walled Beams
5	Aerodynamics	Smoke flow visualization over streamlined and bluff bodies
6	Aerodynamics	Calibration of Pressure scanner and six component force balance
7	Aerodynamics	Measurement of pressure distribution over a wing in the wind tunnel
8	Aerodynamics	Measurement of pressure distribution over a circular cylinder in the wind tunnel
9	Propulsion	Study and calibration of Pressure Sensor and Flow meters
10	Propulsion	Experimental investigations in LPG-Air premixed flames
11	Propulsion	High Speed Flow Visualization using Shadowgraph & Schlieren Technique
12	Propulsion	Calibration of Supersonic Wind Tunnel

Course Plan

- All students will carry out one experiment every week in the following sequence: Structures (4 weeks), Aerodynamics (4 weeks) & Propulsion (4 weeks)
- The material relevant to each week's experiment will be uploaded on MOOKIT by 12.00 (Noon) every Monday
- The first 30 minutes of the Friday session will be used for discussion regarding the experiment scheduled for that day.
- There will be an evaluation (quiz format) for that day's experiment at the end of the lab session (typically 15-30 min. However, the exact duration will be decided depending on the experiment)
- The lab report for each experiment should be uploaded on MOOKIT by next Friday 12.00 NOON (1 week is provided to prepare the report)

Course Evaluation & Policies

The course evaluation will be based on

- Lab Reports – 30 %
- Weekly Lab Evaluation (Quiz format) – 20 %
- End-semester Exam (all experiments included) – 40 %
- Attendance – 10 %

Copyright Information