



Program and Degree: BSc in Aerospace Engineering	
Course Description	
Course Title	Aerodynamics laboratory
Prerequisites	Aerodynamic I
The course aims	<ul style="list-style-type: none">- A strong understanding of the fundamental principles of aerodynamics- Learn engineering methods that are used to calculate the forces and moment generated on airfoils and finite wings
Contents	<ul style="list-style-type: none">- Introduction to fundamental of wind tunnel and its usages- Pressure distribution on cylinder at different flow velocity and find separation point approximately.- Flow visualization on 2-D wing by smoke generator - Effect of surface roughness on drag force at different flow velocity (cylinder, sphere, etc.).- Forces and torques measurement for airplane's model at different flow velocity (subsonic): Examine the effects of velocity, angle of attack, yaw angle and rotation of model on stability coefficients.- Effect of flap angle on pressure distribution for 2 dimensional wing (subsonic).- Boundary layer generation on flat surface at AOA=0 and zero pressure gradient. Measure displacement thickness and other parameters of boundary layer.- Effect of Reynolds number on boundary layer.- Drag force measurement for 2 dimensional wing with total pressure distribution and calculation velocity at trailing edge- Usage of hot wire to measure velocity, turbulence intensity and determine hot wire's calibration graph- wing stall observation, increasing lift under effect of flap, slot, suction, blower
Duration	1 Semester (16 weeks)
Course Hours	3 hours/week
Course Type	Optional