THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Aerospace Engineering I

AEROENG 2200

Credit Hours:
4.00

Course Levels:
Undergraduate (1000-5000 level)

Course Components:
Lecture
Lab

Course Description:
An introduction to fundamental concepts leading to aircraft design, with an emphasis on aerodynamics and aircraft performance.

Prerequisites and Co-requisites:
Prereq: Physics 1250 or 1260 (131); and Math 1152 (152), 1161 (161), 1172 (154), or 1181H, or a grade of C- or above in Math 1544. Prereq or concur: Math 2173 (254), 2153 (153), or 2162 (263).

Course Goals / Objectives:
- Introduce students to the nomenclature and environment of flight
- Educate students in the fundamentals of fluid flow and the concepts of lift and drag
- Train students in the methodology for prediction of aerodynamic characteristics of aircraft
- Introduce aerodynamic concepts of vertical flight and rotorcraft performance
- Develop in students an understanding of how the equations of aircraft motion can be specialized to steady and accelerated flight
- Stimulate understanding of the basic principles with simple laboratory experiences

Course Topics:

- Flight environment, fundamental quantitative concepts, perfect gas law, and the standard atmosphere.
- Equations of fluid flow. Equations of conservation of mass, momentum and energy in one dimension.
- Elementary thermodynamics; isentropic flow; nozzles.
- Applications to subsonic and supersonic wind tunnels.
- Applied aerodynamics; Lift of airfoils, finite wings, pressure distributions; drag of bodies, boundary layers and separation.
- Rotorcraft aerodynamics in hover and forward flight. Basic momentum-disk theory. Helicopter operation and performance characteristics.
- Drag estimates of vehicles; parasitic and induced drag.
- Airplane performance; level and unaccelerated flight; thrust and power.
- Climbs and glides.
- Range and Endurance.
- Accelerated flight: turns, banks, takeoff, and landing.

Designation:
Required
Elective