

MA 560- Advanced Aerodynamics

Course Code:	MA-560
UTAA Credit (Theoretical-Laboratory hours/week):	3(3-0)
ECTS Credit:	6.0
Department:	Mechanical and Aeronautical Engineering
Language of Instruction:	English
Level of Study:	Graduate
Offered Semester:	Fall and Spring Semesters.

Course Objectives

The course aims to get the students to comprehend importance of aerodynamics, to give a general knowledge about three dimensional incompressible flow, inviscid compressible flow, normal and oblique shock waves, compressible flow through nozzles, diffusers and wind tunnels, subsonic compressible flow over airfoils and bluff body aerodynamics.

Course Content

Aerodynamics: Some introductory thoughts: Importance of aerodynamics: Historical examples; three dimensional incompressible flow; inviscid compressible flow; normal shock waves; oblique shock waves; compressible flow through nozzles, diffusers and wind tunnels; subsonic compressible flow over airfoils: Linear theory; bluff body aerodynamics

Course Learning Outcomes

- 1-comprehend the importance of aerodynamics.
- 2-get a general knowledge about three dimensional incompressible flow, three-dimensional source, three-dimensional doublet and flow over a sphere.
- 3-get a knowledge about general three-dimensional flows and panel techniques, applied aerodynamics.
- 4-learn the topic of inviscid compressible flow.
- 5-learn the topic of normal oblique shock waves.
- 6-learn the topic of compressible flow through nozzles, diffusers and wind tunnels and solve the relating problems.
- 7-comprehend subsonic compressible flow over airfoils.
- 8-get a general knowledge about bluff body aerodynamics