

COMPUTATIONAL FLUID DYNAMICS LAB**VII Semester**

Course Code	Category	Hours / Week			Credits	Maximum Marks		
A5AE32	PCC	L	T	P	C	CIA	SEE	Total
		-	-	3	1.5	30	70	100

COURSE OBJECTIVES:

Students undergoing this course are expected:

1. To study and analyze the internal and external aerodynamic properties over major aerodynamic profiles using commercial software packages.
2. To develop a Matlab code to analyze the behavior of the governing equations of Aerodynamics, Thermodynamics, Heat transfer, Aerospace Propulsion etc., and to generate major types of grid over an aerodynamic profile.

LIST OF EXPERIMENTS

- 1 Modelling of basic geometries using sketcher in workbench
- 2 Flow over an airfoil
- 3 2D analysis of road vehicles
- 4 2D analysis of high rise building
- 5 Supersonic flow over a wedge
- 6 Supersonic flow over missiles
- 7 Solution for one dimensional wave equation using explicit method of lax (code development)
- 8 Solution for one dimensional transient heat conduction equation using explicit method (code development)
- 9 Generation of the algebraic grids (code development)
- 10 Generation of the elliptic grids (code development)

Reference Books:

1. ANSYS FLUENT Tutorial Guide 18.0
2. Stormy Attaway, 'MATLAB-A Practical Approach'

COURSE OUTCOMES:

At the end of the course the students are able to:

- 1 Understanding modeling of geometries in computational tools
- 2 analyze internal and external flow using various geometries
- 3 Develop a code for solution for the one-dimensional wave equation using explicit method of lax
- 4 Generation of the algebraic grids and elliptic grids using MATLAB using ANSYS FLUENT
- 5 Evaluate supersonic flow over axi-symmetric bodies