



ME285 Aug 3:0

Turbomachine Theory

Instructor

Raghuraman N. Govardhan

Email: rng@iisc.ac.in

Teaching Assistant

Email:

Department: Mechanical Engineering

Course Time: Mon, Wed, Fri, 2 - 3 PM

Lecture venue:

Detailed Course Page:

Announcements

Brief description of the course

The course is meant for students with interest in understanding the basic fluid mechanics of Turbomachines. It is expected that the concerned taking the course will have a background in Fluid Mechanics. The course gives exposure to the basic principles of axial and radial turbomachines, and ways to analyze and understand the flow within them.

Prerequisites

Fluid Mechanics and Thermodynamics

Syllabus

Axial Turbomachines, Turbomachinery Performance, Three-dimensional flows in axial machines, Losses in turbomachines from vorticity perspective, Centrifugal Compressors/Pumps, Hydraulic turbines / Wind turbines

Course outcomes

The course gives exposure to the basic principles of axial and radial turbomachines, and ways to analyze and understand the flow within them.

Grading policy

35% for assignments, 15% for mid-term, 50% for final

Assignments

(1) Development of a potential flow solver based on vortex panel method for flow through an arbitrary 2D cascade geometry. This is done in three steps, first a simple flat plate code is done, which is then extended for flow past an arbitrary shaped blade in a uniform flow. This is then extended for a cascade geometry.

(2) Practical project. Students are expected to work in groups and analyze a chosen turbomachine in terms of principles learnt in the course and compare it to performance data that is measured.

Resources