

AE 606 Unsteady Gas Dynamics

Syllabus (2017-18, I Semester)

Instructor: Sanjay Kumar (Phone: ext 6768; E-mail: skmr@iitk.ac.in)

Class timings: Mon, Wed (17:10 to 18:25)

Venue: NWTF Lecture Hall

Topics covered:

Non-steady gas dynamics is a one semester course covering fundamentals of dynamics of shock waves, expansion waves, and related discontinuities in gases, shock reflections, refractions, and intersections, real gas effects on shock wave propagation, shock tube techniques, viscosity effects – shocktube boundary layer, shock structure, detonation waves – CJ and ZND models.

Text/Reference Books:

Suggested References:

- P.A. Thompson, Compressible Fluid Dynamics (McGraw Hill)
- W.D. Hayes, Gas Dynamic Discontinuities (Princeton University Press)
- Zeldovich and Raizer, Physics of shock waves and high temperature hydrodynamic phenomenon (Dover)
- G.B. Witham, Linear and Nonlinear waves (Wiley)
- Wildon Fickett and William Davis, Detonation – Theory and Experiment
- Elements of Gas Dynamics. Authors: H.W. Liepmann and A. Roshko
- The Dynamics and Thermodynamics of Compressible fluid Flow vol. 1: Author: A.S. Shapiro

Assessment will be based on the following activities

| Assessment Activity | % Weightage |
|---------------------|-------------|
| Mid-Term Exam | 35 |
| Quizzes | 15 |
| Final Exam | 45 |
| Attendance | 5 |