



ENGINEERING THERMODYNAMICS

PROF. V. RAGHAVAN

Department of mechanical engineering
IIT Madras

INTENDED AUDIENCE : Under Graduate students

COURSE OUTLINE :

Engineering Thermodynamics is the first level thermodynamics course for undergraduate students from ME, CH, AE, MM departments. This is a core course. This course will be helpful for the preparation of competitive exams such as GATE.

The objectives of this course are:

- (i) To understand the concepts & laws of energy conversion involving heat and work interactions.
- (ii) To learn about the property changes occurring in substances during energy conversion processes.
- (iii) To be able to understand the working principles of energy conversion devices.
- (iv) To appreciate the limitations for energy conversion and estimate the maximum performance attainable in practical devices

ABOUT INSTRUCTOR :

Prof. V. Raghavan obtained his PhD degree in Mechanical Engineering from Indian Institute of Technology Madras (IITM), Chennai, India. He did his post-doctoral research in the Department of Mechanical Engineering at the University of Nebraska-Lincoln, USA. He joined IITM in 2007 as an Assistant Professor in the Department of Mechanical Engineering. He is currently working as a professor. He teaches courses such as Thermodynamics, Applied Thermal Engineering, Fundamentals of Combustion, Theory of Fire Propagation, Combustion Technology, etc. His areas of research include evaporation and combustion of liquid fuel droplets, laminar flames, fire modeling, CFD for reacting flows, flame spread and liquid fuel pool combustion, and coal gasification.

COURSE PLAN :

Week 1: Basic concepts

Week 2: Tutorial – 1, Work and heat

Week 3: Tutorial – 2, First law of thermodynamics for systems

Week 4: First law of thermodynamics for systems, Tutorial - 3

Week 5: Pure substances, Tutorial - 4

Week 6: Tutorial - 5

Week 7: First law of thermodynamics for control volumes, Tutorial - 6

Week 8: Second law of thermodynamics

Week 9: Tutorial - 7

Week 10: Entropy

Week 11: Tutorial - 8

Week 12: Thermodynamic Cycles, Tutorial - 9