ME 6101: Course Outline [2024]

Dr. Md. Zahurul Haq, *Ph.D., CEA, FBSME, FIEB*

Professor
Department of Mechanical Engineering
Bangladesh University of Engineering & Technology (BUET)
Dhaka-1000, Bangladesh

http://zahurul.buet.ac.bd/

ME 6101: Classical Thermodynamics
`http://zahurul.buet.ac.bd/ME6101/`

Thermodynamics is a funny subject. The first time you go through it, you don't understand it at all. The second time you go through it, you think you understand it, except for one or two small points. The third time you go through it, you know you don't understand it, but by that time you are so used to it, so it doesn't bother you any more.

Arnold Sommerfeld

Syllabus

Fundamentals of classical thermodynamics, first and second laws; Concept of properties. Reversible and irreversible processes, entropy and other characteristic functions. Maxwell's relations. Equation of state and generalized coordinates; Equilibrium and stability.

Tentative Lecture Plan [2024]

Topic	No. of Lectures [1]
1. Introductory Concepts, Terminology, Work & Heat	1
2. First Law of Thermodynamics	2
3. Second Law of Thermodynamics & Entropy	2
4. Irreversibility	1
5. Thermodynamic Processes & Efficiency Parameters	1
6. Exergy Concepts and Applications	3
7. Thermodynamic Properties & Equations of State (EOS)	2
8. Thermodynamics of Mixtures	3
9. Thermodynamic Relations	3
10. Stability, Phase & Chemical Equilibrium	4

[1] 75 minutes/lecture

Tentative Marks Distribution

1. Assignments [3] 35%
2. Mid-term examination 30%
3. Final examination 35%

Reference Books

- Moran, M.J. & Shapiro, H.N., *Fundamentals of Engineering Thermodynamics*, J. Wiley & Sons, Inc.
- Wark, K. & Richards, D.E., *Thermodynamics*, McGraw-Hill, Inc.
- Wark, K., *Advanced Thermodynamics for Engineers*, McGraw-Hill, Inc.
- Shell, M.S., *Thermodynamics and Statistical Mechanics: An Integrated Approach*, Cambridge University Press.
- Winterbone, D. *Advanced Thermodynamics for Engineers*, Butterworth-Heinemann.