

Title: Thermodynamics, “the laws of the Universe” from faSteam engines, life processes to galactic rotation. Part 2

Please note: 2 semester course.

This class will be a discussion of classical thermodynamics using the Great Course, “Thermodynamics: Four laws that move the Universe” as the core teaching material. The class is intended to be a two part (two semester) program. We will augment the core material with explanations of the simple math used in the class, history of the development of thermodynamic science and some specialty items of interest.

Some specialty items will be “how batteries work”, generation of electricity from river mouths using osmotic pressure and a few others that we develop.

The second semester course presentation is as follows:

- 13 How materials respond to heat
- 14 Phases of matter – gases, liquids and solids
- 15 Phase diagrams – ultimate material maps
- 16 Properties of phases
- 17 To mix, or not to mix?
- 18 Melting and Freezing of mixtures
19. The Carnot engine and limits of efficiency
20. More Engines – materials at work
21. The electrochemical Potential
22. Chemical reactions – getting to equilibrium
23. The chemical reaction quotient
24. The greatest processes in the world.