

## SYLLABUS CURRICULUM

<b>COURSE</b>	<b>Course Name : THERMODYNAMICS I</b>
	<b>Course Code : TM184306</b>
	<b>Credit : 3 sks</b>
	<b>Semester : III</b>

### COURSE DESCRIPTION

Thermodynamics is a science that deals with concepts, dynamics, changes in shape, and energy transfer through work and heat and its applications in thermal power, cooling, and thermal pump systems. The thermodynamic course of Technique I discusses the definitions, basic concepts, and laws of Thermodynamics I and II, the nature and state of a single simple and compressible substance. In this course also discussed the application of techniques that include energy analysis, engineering systems, entropy and steam power systems. This course is taught through lectures in class, response / case study and laboratory practice. Students are expected to apply the concept and law of thermodynamics in engineering analysis.

### LEARNING OUTCOMES

LO6	Understand the engineering principles in mechanical system to identify, formulate and solve the problem of mechanical engineering.
LO9	Able to find the source of engineering problems in mechanical system through research that includes identification, formulation, analysis, data interpretation based on engineering principles.
LO10	Able to formulate the solution of engineering problem in mechanical system by considering economy, safety, environment and energy conservation.

### COURSE LEARNING OUTCOMES

- Able to understand and analyze basic concepts of thermodynamics, which include forms of energy, nature, state level (single phase, mixture and ideal gas), processes and cycles.
- Able to apply the laws of Thermodynamics I and II on a set of volumes and a set of masses to solve the problems of temodynamics.
- Able to understand, analyze and solve problems of steam power system.

### MAIN SUBJECT

- Basic definitions and concepts of thermodynamics
- System dimensions & units
- The nature and state of a single simple compressible substance and ideal gas,
- The Law of Thermodynamics I, and energy analysis on the set and volume adjusted masses,
- Law of Thermodynamics II, analysis of entropy balance

- Analysis of engineering systems and steam power systems.

**PREREQUISITES**

Fundamental Physics I & II

**REFERENCE**

1. Moran J. Michael & Howard N. Saphiro, "Fundamental of Engineering Thermodynamics", Sixth Edition, John Wiley and Sons Inc., New York, 2000.
2. Yunus A. Cengel & Michael E. Boles, "Thermodynamics: An engineering approach", Fifth Edition, Mc-Graw Hill, 2004.
3. Reynold Perkins, "Engineering Thermodynamics", Edisi ketiga, Airlangga, Jakarta, 1994.
4. J. P. Holman, "Thermodynamics", Mc-Graw Hill, 2004.