# APPLIED THERMODYNAMICS LABORATORY

**IV Semester: ME**

| Course Code | Category | Hours / Week | | | Credits | Maximum Marks | | |
|---|---|---|---|---|---|---|---|---|
| **AMEC17** | **Core** | **L** | **T** | **P** | **C** | **CIA** | **SEE** | **Total** |
| | | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| **Contact Classes: Nil** | **Tutorial Classes: Nil** | **Practical Classes: 36** | | | | **Total Classes: 36** | | |

**Prerequisite: There are no prerequisites to take this course.**

## I. COURSE OVERVIEW:

Applied Thermodynamics is science intended to introduce concepts and working principles of internal combustion engines which are widely used in different industrial applications such as automobile, agriculture, industry for transport, water pumping, electricity generation, earth moving and for supply mechanical power. This course also deals with working principles of compressors and refrigeration systems in various fields of engineering.

## II COURSE OBJECTIVES:
**The students will try to learn:**

I. The concepts related to the operation of internal combustion engines based upon the fundamental engineering sciences of thermodynamics.
II. The techniques for improving the efficiencies and performance of compressors and refrigeration systems retained to practical applications such as irrigation, air conditioning and refining oil and gas.
III. The performance of Heat Engines in real-time applications by applying the various testing parameters of an engine.

## III LIST OF EXPERIMENTS:

**Week-1**: Valve timing diagram of an IC engine.

Batch 1 & Batch2: Draw the Valve timing diagram of IC engine.

**Week-2**: Port timing diagram of an IC engine

Batch 1 & Batch2: Draw the Port timing diagram of IC engine.

**Week-3**: performance test for 2 stroke SI engine

Batch 1 & Batch2: Conduct Performance for 2-strole petrol engine.

**Week-4**: performance test for 4 stroke SI engine

Batch 1 & Batch2: Conduct Performance for 4-stroke petrol engine.

**Week-5**: IC engine Morse and motoring tests

Batch 1 & Batch2: Conduct Morse test on 4-stroke Multi cylinder SI engine.

**Week-6**: heat balance on SI engine

Batch 1 & Batch2: Prepare Heat balance sheet for 4-stroke Multi cylinder SI engine

**Week-7**: Performance test on variable compression ratio engine

Batch 1 & Batch2: Conduct Performance for 4-stroke CI engine

**Week-8**: Performance test on diesel engine (mechanical loading)

Batch 1 & Batch2: Conduct Performance for 4-stroke CI engine.

**Week-9**: Heat balance on CI engine

Batch 1 & Batch2: Prepare Heat balance sheet for CI engine.

**Week- 10**: Volumetric efficiency of a reciprocating air compressor

Batch 1 & Batch2: Determine volumetric efficiency of an air compressor.

**WeeK-11**: Assembling and dis Assembling IC engine

Batch 1 & Batch2: Assemble and dissemble the components of an IC engine.

**Week-12**:  Study of boilers

Batch 1 & Batch2: Understand and observe the working of boilers from prototype models.

## II. REFERENCE  BOOKS:

1.   V. Ganesan, "I.C. Engines", Tata McGraw-Hill, 3rd Edition, 2011
2.   B. John Heywood, "Internal Combustion Engine Fundamentals", Tata McGraw-Hill, 2nd Edition,2011.
3.    K. Rajput, "Thermal Engineering", Lakshmi Publications, 1st Edition, 2011.

## III. WEB REFERENCES:

1.   https://nptel.ac.in/courses/112102103/16
2.   https://nptel.ac.in/courses/112107078/37