



# THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

## *Department of Mechanical Engineering*

### **MEE 206 – Basic Engineering Thermodynamics**

#### **COURSE PARTICULARS**

**Course Code:** MEE 206

**Course Title:** Basic Engineering Thermodynamics

**No. of Units:** 3

**Course Duration:** Two hour of theory and three hours of practicals per week for 12 weeks.

**Status:** Compulsory

**Course Email Address:** NIL

**Course Webpage:** NIL

**Prerequisite:** NIL

#### **COURSE INSTRUCTORS**

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#### **COURSE DESCRIPTION**

This course is an introductory course to all other thermodynamics-based courses; it is very useful for students in all forms of engineering because it's a foundation course for engineers in all disciplines. However, it also meets the need of students in other hard science related fields, as a course that provides the basic introduction to the three solid state of matter. The principles are introduced so that a clear understanding of the basic issues related to thermodynamics are well understood As a practical course, the focus is to impart useful skills on the students in order to give them a total reorientation of engineering challenges they find within their environment.

## **COURSE OBJECTIVES**

The objectives of this course are to:

- Introduce students to thermodynamic and its forms; and
- Gives the students opportunities to explore such real life forms of thermodynamic situations within their environment.

## **COURSE LEARNING OUTCOMES / COMPETENCIES**

Upon successful completion of this course, the student will be able to:

*(Knowledge based)*

- Understand the basic laws and principles of thermodynamics and relate it to situations within their immediate environment;
- Classify and explain the function of different thermodynamics components;
- Understand the purpose of thermodynamics in solving engineering problems;

*(Skills)*

- Students would be able to apply the principles and laws of thermodynamics to solve real life engineering problems or cases related energy issues.

## **GRADING SYSTEM FOR THE COURSE**

This course will be based on this weighting scheme:

Class Attendance	10%
Problem sets (Assignment)	15%
Mid Term Exam (Test)	15%
<u>Final Examination</u>	<u>60%</u>
<b><u>TOTAL</u></b>	<b><u>100%</u></b>

Your total percentage shall be used to compute your final grade. *Grades are not negotiable!*

## **GENERAL INSTRUCTIONS**

**Attendance:** It is expected that every student be in class for lectures and also participate in all forms of practical exercises. Attendance records would be kept and used to determine if a student is qualified to sit for the final examination. In case of illness or any other unavoidable cause of absence, the student must communicate as soon as possible to any of the instructors, indicating the reason for the absence.

**Academic Integrity:** Our job is to be your guide in the learning process. It is our responsibility to provide you with access to the resources you need in order to master the course. We shall provide you with lectures and problem sets to prepare you for exams. Ultimately, however, *you are responsible for your own learning*. To maximize your learning, I recommend that you attend lectures regularly and complete the entire problem set. If you work hard and demonstrate mastery of the material, you will get an “A”!

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person’s work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students’ misconduct as spelt out in the Students’ Handbook.

**Problem Sets (Assignments):** The purpose of the problem sets is to help you learn, to help your grade, and to help you prepare for your future career by working in teams to solve problems and present work in a written format. An honest effort on the problem sets is guaranteed to help your grade and will clearly provide the best preparation for the tests and exam. Students are expected to submit assignments as scheduled, failure to submit assignments as at when due will earn you zero for that assignment, but only under extenuating circumstances, for which a student has notified any of the instructors in advance would late submission of be permitted.

**Code of Conduct in Lecture Rooms and Laboratories:** Students should always turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as chatting, texting, watching videos, *etc.*) during lectures.

## READING LIST

Bello, E.I. and Ogedengbe T.I. (2007) *Basic Engineering Thermodynamics*

Eastop, T.D. and McConkey A. (1982) *Applied Thermodynamics for Engineering Technologists*,  
*Longman, London*

Rogers, G.F.C. and Mayhew, T.R. (1967) *Engineering Thermodynamics and Heat Transfer*,  
*Longman, London*

## COURSE OUTLINE

**Note: Approximate lecture schedule (subject to change!)**

<b>Week</b>	<b>Topic</b>	<b>Remarks</b>
1	Introduction to the Course and some basic definitions on thermodynamics	An introductory class to the course
2 & 3	Definition of basic thermodynamics terminologies; .system; state properties and processes	During this class, the student is expected to get familiar with the basic thermodynamics definitions.
4 & 5	Energy and energy conversion; work, heat, non – flow processes, zeroth law of equilibrium and flow processes.	ASSIGNMENT I
6	First law of thermodynamics and application to close and open system.	MID-SEMESTER TEST
7	The steady state flow energy equation and its application.	
8 & 9	Thermodynamic cycles; otto, diesel, dual and carnot cycles	ASSIGNMENT II
10	Second law of thermodynamics; consequences and applications of the law. Thermodynamic properties of ideal and real fluids.	
11	Thermodynamics tables, Introduction to steam power and refrigeration cycles.	ASSIGNMENT III
12	Revision	This is the week preceding the final examination; during this period, evaluation will be done to assess how well the students' expectations for the course have been met.

