DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING
MECHANICAL ENGINEERING PROGRAM, BSC.

Course Syllabus

1. **Course number and name**
   ME 509 Internal Combustion Engines

2. **Credits and contact hours**
   (3+0) 3 credit hours, 3 contact hours

3. **Course type**
   Face to face Learning Course (3+0)

4. **Instructor's or course coordinator's name**
   Eng. Dia' A. Afaneh

5. **Textbook information**
   Engineering Fundamentals of the Internal Combustion Engine, by W.W. Pulkrabek, 2nd Edition, Pearson Education Limited, 2014.

   a. **Other supplemental materials**
   -Introduction to Internal Combustion Engines (4th Edition) by Richard Stone, Stone R. Published 2012
   -Internal Combustion Engines & Air Pollution, by Edward F. Obert.
   -Internal Combustion Engine Fundamentals, by J.B. Heywood.
   -Internal Combustion Engines in Theory & Practice, by C.F. Taylor
   - Instructor's Notes

6. **Specific course information**
   a. **Catalog description**
   Introduction to types of internal combustion engines, Performance Characteristics of IC Engines, Operation Principles, Method of Approach, Ideal & Actual Cycles, First law application to Combustion, Pollution & Impact on Environment.

   b. **Prerequisites or co-requisites**
   Prerequisite: ME 222 Thermodynamics 2

   c. **The course is:**
   Required in Mechanical Engineering Department.

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7. Specific goals for the course

a. Course outcomes:

After completion of the course, students are expected to be able to:

1. Identify different types of I. C. Engines, their characteristics, power range and applications.
2. Perform cycle analysis and calculations of engine performance characteristics.
3. Model, analyze and design attempts of I.C. Engines.
4. Study ideal and actual cycles in IC

b. The following student outcomes are addressed by the course:

SO-(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

SO-(pc-2) prepare students to work professionally in thermal systems

8. Learning Outcomes and their Alignment with Program Educational Objective (PEO's), Methods of Delivery, and Assessment Methods:

Learning Outcomes	Program PEOs	Method of Delivery	Assessment Method
Course Outcomes			
Identify different types of I. C. Engines, their characteristics, power range and applications.	-	Lectures (Example and Problems)	Question in exam
Perform cycle analysis and calculations of engine performance characteristics.	-	Lectures (Example and Problems)	Question in exam
Model, analyze and design attempts of I.C. Engines.		Lectures (Example and Problems)	Question in exam
Study ideal and actual cycles in IC	-	Lectures (Example and Problems)	Question in exam
Student Outcomes			

SO-(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.			
SO-(pc-2) prepare students to work professionally in thermal systems			

9. Weekly Teaching Plan

Week No.	Lecture	Topic	Method of Delivery
1	Sun (9-10)	Chapter 1: INTRODUCTION	Lecture
	Tue (9-10)	Chapter 1: INTRODUCTION	Lecture
	Thu (9-10)	Chapter 1: INTRODUCTION	Lecture
2	Sun (9-10)	Chapter 1: INTRODUCTION	Lecture
	Tue (9-10)	Chapter 1: INTRODUCTION	Lecture
	Thu (9-10)	Chapter 1: INTRODUCTION	Lecture
3	Sun (9-10)	Chapter 2: OPERATING CHARACTERISTICS	Lecture
	Tue (9-10)	Chapter 2: OPERATING CHARACTERISTICS	Lecture
	Thu (9-10)	Chapter 2: OPERATING CHARACTERISTICS	Lecture
4	Sun (9-10)	Chapter 2: OPERATING CHARACTERISTICS	Lecture
	Tue (9-10)	Chapter 2: OPERATING CHARACTERISTICS	Lecture
	Thu (9-10)	Chapter 2: OPERATING CHARACTERISTICS	Lecture
5	Sun (9-10)	Chapter 2: OPERATING CHARACTERISTICS	Lecture
	Tue (9-10)	Chapter 2: OPERATING CHARACTERISTICS	Lecture

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	Thu (9-10)	First Exam	Exam
6	Sun (9-10)	Chapter 3: ENGINE CYCLES	Lecture
	Tue (9-10)	Chapter 3: ENGINE CYCLES	Lecture
	Thu (9-10)	Chapter 3: ENGINE CYCLES	Lecture
7	Sun (9-10)	Chapter 3: ENGINE CYCLES	Lecture
	Tue (9-10)	Chapter 3: ENGINE CYCLES	Lecture
	Thu (9-10)	Chapter 3: ENGINE CYCLES	Lecture
8	Sun (9-10)	Chapter 3: ENGINE CYCLES	Lecture
	Tue (9-10)	Chapter 3: ENGINE CYCLES	Lecture
	Thu (9-10)	Chapter 3: ENGINE CYCLES	Lecture
9	Sun (9-10)	Chapter 4: THERMOCHEMISTRY & FUELS	Lecture
	Tue (9-10)	Chapter 4: THERMOCHEMISTRY & FUELS	Lecture
	Thu (9-10)	Chapter 4: THERMOCHEMISTRY & FUELS	Lecture
10	Sun (9-10)	Chapter 4: THERMOCHEMISTRY & FUELS	Lecture
	Tue (9-10)	Chapter 4: THERMOCHEMISTRY & FUELS	Lecture
	Thu (9-10)	Chapter 4: THERMOCHEMISTRY & FUELS	Lecture
11	Sun (9-10)	Chapter 4: THERMOCHEMISTRY & FUELS	Lecture
	Tue (9-10)	Chapter 4: THERMOCHEMISTRY & FUELS	Lecture
	Thu (9-10)	Second Exam	Exam
12	Sun (9-10)	Chapter 9: EMISSIONS AND AIR POLLUTION	Lecture
	Tue (9-10)	Chapter 9: EMISSIONS AND AIR POLLUTION	Lecture
	Thu	Chapter 9: EMISSIONS AND AIR POLLUTION	Lecture

	(9-10)		
13	Sun (9-10)	Chapter 9: EMISSIONS AND AIR POLLUTION	Lecture
	Tue (9-10)	Chapter 9: EMISSIONS AND AIR POLLUTION	Lecture
	Thu (9-10)	Chapter 9: EMISSIONS AND AIR POLLUTION	Lecture
14	Sun (9-10)	Chapter 11: FRICTION AND LUBRICATION	Lecture
	Tue (9-10)	Chapter 11: FRICTION AND LUBRICATION	Lecture
	Thu (9-10)	Chapter 11: FRICTION AND LUBRICATION	Lecture
15	Sun (9-10)	Chapter 11: FRICTION AND LUBRICATION	Lecture
	Tue (9-10)	Chapter 11: FRICTION AND LUBRICATION	Lecture
	Thu (9-10)	Chapter 11: FRICTION AND LUBRICATION	Lecture

10. Grade Distribution:

Assessment	Grade	Date
- First Exam	20%	Fifth Week
- Second Exam	20%	10th Week
- Assignments	10%	
- Final Examination	50%	16th Week

* Make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.