University: Cairo **Faculty: Engineering** **Department: Aerospace Engineering**

Course Specifications

Programme on which the course is given: B.Sc. in Aerospace Engineering

Major or minor element of programme: Major

Department offering the programme: Aerospace Department

Department offering the course: Aerospace Department

Academic year / Level: 2nd year

Date of specification approval:

A- Basic Information

Title:	Internal Combustion Engines	**Code:**	AER-206		
Credit Hours:	3	**Lectures:**	3		
Tutorials:	1	**Practical:**			

B- Professional Information

1- Overall Aims of Course

The course aims at teaching the student the basic concepts of the internal combustion engines.

2- Intended Learning Outcomes of Course

a- Knowledge and Understanding

The components of the internal combustion engine are introduced to the student emphasizing the function of each component. The engine types and their performance are characterized. The combustion process in both spark-ignition and compression-ignition engines are explained. Upon completion of this course, the student will be able to perform design and analysis calculations of the internal combustion engines including ideal and real cycle analysis.

b- Intellectual Skills

The ability to analyze the systems of the internal combustion engine and suggest new concepts.

c-Professional and Practical Skills

The ability to measure the performance of internal combustion engines and choose an engine for certain application.

d- General and Transferable Skills

computing, writing computer programs, analyzing results

3- Contents

Topic	No. of hours	Lectures	Tutorial
Engine Types and Their Operation	7	6	1
Engine Design and Operating parameters	5	4	1
Engine Operating Characteristics	5	4	1
Thermochemisrty of Fuel-Air Mixtures	12	8	4
Ideal Models of Engine Cycles	12	8	4
Gas Exchange Processes	5	4	1
Carburetors	5	4	1
Injection Systems	3	2	1
Review	2	2	-
	56	42	14

4- Teaching and learning Methods

lectures through discussion, assignments with design and analysis problems, assignments for information collection.

5- Student Assessment Methods

5.1	Assignments	to assess	understanding basic concepts
5.2	Tests	to assess	problem solving
5.3	Exams	to assess	ability to use information for analysis of problems

Assessment Schedule

Assessment	week
Assignment 1	2
Assignment 2	4, 6
Assignment 3	8, 10
Assignment 4	12, 14
Test 1	6
Mid-Term	9

Weighting of Assessments

Mid-Term	10 %
Course work	20 %
Final Exam	70 %

6- List of References

6-1 Course Notes

not available

6-2 Essential Books (Text Books)

"Internal Combustion Engine Fundamentals" by John Heywood, McGraw-Hill, 1988.

6-3 Recommended books

"Internal combustion Engine Theory and Practice", by S.P.Sen, Khanna Publishers Delhi, 1984

6-4 Periodicals, Web sites, …. etc

www.howstuffworks.com

7- Facilities Required for Teaching and Learning

Lecture rooms, projector and overhead projectors, computer and internet connection

Course Coordinator: Dr. Ola Rashed

Head of Department: Prof. Ayman H. Kassem

Date: March, 2015.