A. Basic Information

Course Title: Internal Combustion Engines  
Code: MPE412  
Lecture: 3  
Tutorial: 3  
Practical:  
Total: 6  
Program on which the course is given: B.Sc. Mechanical Engineering (Power)  
Major or minor element of program: Major  
Department offering the program: Mechanical Engineering Department  
Department offering the course: Mechanical Engineering Department  
Academic year / level: Fourth Year / First Semester  
Date of specifications approval: 10/5/2006

B. Professional Information

1. Overall aims of course
   By the end of the course the students will be able to:
   1- Be familiar with the fundamental operating principles and practices used in internal combustion engines.
   2- Solve problems related to old and up to date internal combustion engines.

2. Intended Learning outcomes of Course (ILOs)

   a. Knowledge and Understanding:
      a.1) Concepts and theories of mathematics and sciences, appropriate to the discipline.
      a.5) Methodologies of solving engineering problems, data collection interpretation.
      a.6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.
      a.8) Current engineering technologies as related to disciplines.
      a.14) Internal combustion, pumps, turbines and compressors, classification, construction design concepts, operation and characteristics.
      a.16) The constraints which mechanical power and energy engineers have to judge to reach at an optimum solution.
a.19) Basic theories and principles of some other engineering and mechanical engineering disciplines providing support to mechanical power and energy disciplines.

b. Intellectual Skills
b.1) Select appropriate mathematical and computer-based methods for modeling and analyzing problems.
b.7) Solve engineering problems, often on the basis of limited and possibly contradicting information.
b.16) Analyze the performance of the basic types of internal combustion engines and hydraulic machines.

c- Professional and Practical Skills
c.1) Apply knowledge of mathematics, science, information technology, design, business context and engineering practice to solve engineering problems.
c.3) Create and/or re-design a process, component or system, and carry out specialized engineering designs.
c.8) Apply safe systems at work and observe the appropriate steps to manage risks.
c.12) Prepare and present technical reports.
c.18) Carry out preliminary designs of fluid transmission networks, internal combustion and steam engines and solve their operational problems.

d- General and Transferable Skills
d.1) Collaborate effectively within multidisciplinary team.
d.5) Lead and motivate individuals.
d.7) Search for information and engage in life-long self learning discipline.

3. Contents

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4. Teaching and Learning Methods
   ✓ Lectures
   ✓ Practical training / laboratory
     Seminar / workshop
   ✓ Class activity
   ✓ Case study
   ✓ Assignments / homework
   Other:__________________________

5. Student Assessment Methods
   ✓ Assignments to assess knowledge and intellectual skills..
   ✓ Quiz to assess knowledge, intellectual and professional skills.
   ✓ Mid-term exam to assess knowledge, intellectual, professional and general skills.
   ✓ Oral exam to assess knowledge and intellectual skills.
   ✓ Final exam to assess knowledge, intellectual, professional and general skills.
   Other:__________to assess ______________________________.

6. Assessment schedule
   Assessment 1 on weeks 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13.
   Assessment 2 Quizzes on weeks 4, 7, 11, 13
   Assessment 3 Mid-term exam on week 8
   Assessment 4 Oral Exam on week 14
   Assessment 5 Final exam on week 15

7. Weighting of Assessments
Mid- Term Examination 10 
Final- Term Examination 60 
Oral Examination 10 
Practical Examination 10 
Semester Work (Assignments) 05 
Other (Quizzes) 05 
Total 100

8. List of References

8.1 Course Notes

- Course notes prepared by instructor.

8.2 Essential Books (Text Books)


8.3 Recommended Books

Internal Combustion Fundamentals, John B.entals,

8.4 Periodicals Web sites, etc

9. Facilities Required for Teaching and learning

Lecture room equipped with overhead projector, Presentation board, computer and data show, Laboratory

Course coordinator: Dr. Zakaria El-behiry, Dr. Khairy Hausien
Course instructor: Dr. Zakaria El-behiry, Dr. Khairy Hausien
Head of department: Prof. Dr Maher G. Higazy

Date: 6 / 01 / 2012