



University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

Form no. (12): Course Specification

1- Course Data

Course Code: ME 382	Course Title: Internal Combustion Engines (2)	Academic Year/Level: 3rd year / 6th semester	
Specialization: Mechanical	No. of Instructional Units 3 credits	Lecture 2 hrs.	Practical 2 hrs.

2- Course Aim

- To teach students fundamentals of diesel engine operation and engine systems.
- To help students acquire the ability to do simple design calculations
- To teach students the basics of diesel engine systems and testing

3- Intended Learning Outcomes

a- Knowledge and Understanding	<p>Through knowledge and understanding, students will be able to:</p> <p>a.6) Quality assurance systems, codes of practice and standards, health and safety requirements and environmental issues.</p> <p>a.7) Business and management principles relevant to engineering.</p> <p>a.p.2) Internal combustion, pumps, turbines and compressors, classification, construction design concepts, Operation and characteristics</p> <p>a.a.1) Detailed knowledge and understanding of the themes and specialist subjects of the automotive</p> <p>a.a.6) The drivability, safety limitations and compulsory tests especially applied in automotive</p>
b- Intellectual Skills	<p>Through intellectual skills, students will be able to:</p> <p>b.5) Assess and evaluate the characteristics and performance of components, systems and processes</p> <p>b.p.1) Evaluate mechanical power and energy engineering designs, processes and performances and propose improvements.</p> <p>b.a.2) The ability to assess and analyze information in support of problem solving, design and development, critical evaluation of alternatives and performance data</p> <p>b.a.3) Create solutions to automotive engineering especially to manufacturing and maintenance problems</p>
c- Professional Skills	<p>Through professional and practical skills, students will be able to:</p> <p>c.8) Apply safe systems at work and observe the appropriate steps to manage risks.</p> <p>c.p.1) Use basic workshop equipment safely and appropriately.</p> <p>c.p.5) Design, operate, repair and maintain fluid hydraulic power systems for diverse applications</p> <p>c.p.7) Work in mechanical power and energy operations, maintenance and overhaul</p> <p>c.a.1) Using special automotive test & measurement equipment and conducting experimental laboratory</p>

d- General Skills	Through general and transferable skills, students will be able to: d.2) Work in stressful environment and within constraints. d.7) Search for information and engage in life-long self learning discipline
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4- Course Content

Week No.1	Introduction to D.E.
Week No.2	Analysis of Actual Cycle of Diesel Engine Using “El Chelberg Chart”
Week No.3	Analysis of Actual Cycle of D.E. Using “ El Chellberg Chart”
Week No.4	Charging and Scavenging Process
Week No.5	Combustion Process in D.E
Week No.6	Combustion Process in D.E
Week No.7	Fuel Injection System / 7th week evaluation
Week No.8	Fuel Injection System (Cont.)
Week No.9	Fuel Injection System (Cont.)
Week No.10	Exhaust Emissions (Formation – Effects – Measurements – Control – Standards)
Week No.11	Exhaust Emissions (Formation – Effects – Measurements – Control – Standards)
Week No.12	Super Charging - / 12th week evaluation
Week No.13	Turbocharging.
Week No.14	Engine Operating Characteristics
Week No.15	Rivision
Week No.16	Final Examination

5- Teaching and Learning Methods

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars

6-Teaching and Learning Methods for Students with Special Needs

<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Seminars <p><u>Engineering Requirements and Design Considerations in college Buildings and its Leading Passages</u></p> <ul style="list-style-type: none"> • The design of college buildings and pedestrian passages leading to it are sloppy to allow the transportation of the handicapped; • Doors are wide enough to let wheel chairs pass through easily and conveniently. • Lifts are provided for movement between floors. • Doors are made from light weight materials to make it easy for the handicapped suffering from weakness in limb muscles or those handicapped using prosthetic limbs to deal with them with the least muscular effort.
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- Class floors are made from non-slippery materials to prevent falls on the part of the handicapped.
 - Sudden changes in the floor level are prevented.
- Design Considerations of the Classes**
- Class boards are placed at 60 cm high to allow wheeled chair users or those suffering from limited arm mobility use them.
 - Enough spaces are left between seats and benches to prevent hindering the movement of wheeled chairs between them.
 - Handicapped students sit among normal people in class to be able to interact with them. Nevertheless, in urgent cases according to the nature of the disability, the handicapped students sit in fixed suitable places whether at the front or the back of the class.
 - Handicapped students sit close to the main exits of the class to be able to evacuate in case of emergencies.
- Academic Support:**
- The general academic advisor appoints an academic supervisor for handicapped students.
 - Continuous follow ups are made for handicapped students after each assessment to evaluate their academic level of achievement

7- Student Assessment

a-Procedures used	1-Written Examinations to assess The Intended Learning Outcomes.	
	2-Class Activities (Reports, Discussions, -----) to assess The Intellectual and general Skills.	
b- Schedule:	Assessment 1 Assessment 2 Assessment 3 Assessment 4	7 th Week Assessment 12 th Week Assessment Continuous Assessments 16 th Week Final Written Exam
c- Weighing of Assessment	7 th Week Evaluation 12 th Week Evaluation Final-term Examination Oral Examination Practical Examination Semester Work Total	30 % 20 % 40 % 00 % 00 % 10 % 100%

8- List of References:

a- Course Notes	N/A
b- Required Books (Textbooks)	• Bartlett, Tim. , "The Adlard book of Diesel engines", Adlard Coles Nautical. – Latest Edition.
c- Recommended Books	• William K. Tobold, " Diesel Fundamentals, service, repair", latest edition, the Goreadheart, willeax company Inc.
d- Periodicals, Web Sites, etc.	N/A

Course Instructor: **Dr. Walid Abdel Ghaffar**

Head of Department: **Prof. El-Sayed Saber**

Program Manager: **Prof. El-Sayed Saber**

Dean of College of Engineering and Technology of AASTMT

Name: **Prof. Moustafa Hussein Aly**

Signature:

Executive Manager of Quality Assurance Center of AASTMT

Name: **Prof. Aziz Ezzat**

Signature:

