

The University of Jordan
School of Engineering
Department of Mechatronics Engineering
2nd Semester – 2015/2016



Course: Autotronics – 0908481 (3 Cr. – Elective Course)

Instructor: Dr. Hussam Khasawneh
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Office Hours: Sun Tue 10:00-11:00AM, Mon Wed 9:30-11:00AM
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Catalog Data: This course aims at providing the student with a general overview of modern automotive systems. The internal combustion engine (ICE) will be explained. Also, fundamentals of vehicle dynamics will be covered. In addition, this course discusses various electric and electronic systems in the automobile.

Prerequisites by Course:

- Thermal and Fluid Science– 0904248.

Prerequisites By Topic: The student should have the basic knowledge of electronics, mechanics, and thermal and fluid sciences.

Textbook:

- Handouts by instructor.
- *Automotive Engineering Fundamentals*, Richard Stone and Jeffrey K. Ball (2004), SAE.

References:

- *Internal Combustion Engine Fundamentals*, John B. Heywood (1988), McGraw Hill.
- *Fundamentals of Vehicle Dynamics*, Thomas D. Gillespie (2014), SAE.

Schedule & Duration: 16 weeks, 32 lectures (75 minutes each) plus exams.

Minimum Student Material: Textbook, class handouts, scientific calculator, and an access to a personal computer.

Minimum College Facilities: Classroom with whiteboard and projection display facilities, library, computational facilities with MATLAB and other engineering programs.

Course Objectives: The course provides the student with general overview of automotive systems. Starting with fundamentals of internal combustion engine (ICE) construction and operation, automotive transmission, automotive suspension, automotive steering system, automotive electric and electronic system.

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should:

1. Have a general idea about automotive engineering history and challenges in future. (f,h,j)
2. Understand the working principles of the gasoline and diesel engines for automotive applications. (a)
3. Understand the structure and the working principle of the transmission system. (a)
4. Understand the fundamentals of vehicle dynamics. (a,e)
5. Understand the automotive electrical and electronics systems. (a)
6. Identify the mechatronics systems in automobile. (e,l)
7. Conduct research on the state-of-the-art automotive systems. (d,g,j)

Course Topics:

	Topic Description	Hrs
1.	Internal combustion engines (ICE): working principles of gasoline and diesel ICE	3
2.	Internal combustion engines (ICE): operating parameters	4
3.	Fuel delivery and injection system (mechatronic system)	2
4.	Drivetrain	5
5.	Brakes and tires	4
6.	Mechatronic systems in brakes	2
7.	Steering system	4
8.	Mechatronic systems in steering	2
9.	Suspension	4
10.	Mechatronic systems in suspension	2

Ground Rules: **Attendance is required** and highly encouraged. To that end, attendance will be taken every lecture; Absence of more than 7 hours will result in the expulsion of the student from the course.

Make up Examinations:

There will be no make up exams for any exam that will be taken during the course. exceptions to this rule is restricted only to the following cases:-

1. death of only first order relatives (father, mother, sister, or brother).
2. hospital entry (in-patient) during thr time of the examination.

Any other cases will be given the zero mark in the corresponding exam.

Assessments: Exams, Projects, and Assignments.

Grading policy:

Midterm Exam	30%
Homework	10%
Project	10%
Final Exam	50 %
Total	100%

Last Updated: January, 2016