



Jordan University of Science and Technology
Faculty of Engineering
Mechanical Engineering Department

ME527 Automotive System - JNQF Level: 7

First Semester 2023-2024

Course Catalog

3 Credit Hours. Engine cycles, gas-exchange processes, fuel metering, ignition, combustion and emissions, turbo-charging, and overall performance. Electrics and electronics, control and instrumentation, sensors and actuators. Electronic engine and vehicle control, Electric and hybrid vehicles.

Text Book

Title	Internal Combustion Engines
Author(s)	Colin R. Ferguson and Allan T. Krkpatrick, 2001
Edition	2nd Edition
Short Name	Text Book
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#1	Internal Combustion Engine Fundamentals,	J.B. Heywood	1st Edition	
Ref#2	An Introduction to Combustion	Stephen R. Turns.	2nd Edition	
Ref#3	Electric and Hybrid Vehicles VEHICLE POWERTRAIN SYSTEMS	Behrooz Mashadi and David Crolla	1st Edition	John Wiley & Sons, Ltd

Instructor

Name	Prof. Ghassan Tashtoush
Office Location	M5 L2

Office Hours	Sun : 11:30 - 12:30 Mon : 12:00 - 14:00 Tue : 11:30 - 12:30 Thu : 09:30 - 10:30 Thu : 11:30 - 12:30
Email	gtash@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 12:30 - 13:30 Room: M5126

Prerequisites		
Line Number	Course Name	Prerequisite Type
253220	ME322 Thermodynamics (2)	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	The different types of internal combustion engines and the parameters that define engine performance	From Text Book
Week 2	Thermodynamic analysis of engine cycles	From Text Book
Week 3	Gas exchange processes in four-stroke and two-stroke cycle engines	From Text Book
Week 4	Spark-ignition (SI) engine combustion, emissions formation and control	From Text Book
Week 5	Diesel engine combustion, emissions formation and control	From Text Book
Week 6	Engine fuels metering and requirements	From Text Book
Week 7	Turbo-charging and overall Engine operating characteristics and performance	From Text Book , From Ref#1
Weeks 8, 9, 10	Electrics and electronics, engine and vehicle control and instrumentation, sensors and actuators.	From Ref#1
Weeks 11, 12, 13	Hybrid engines and Electric vehicle	From Ref#3
Weeks 14, 15	Fuel cell and hydrogen engines	From Ref#3

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Formulate and solve engineering tasks related to the most representative automotive systems using the thermodynamics principles [20SO1, 10SO2, 10SO6] [10L7K1, 10L7S1, 10L7S3, 10L7C1]	40%	First Exam, Assignments and Quizes, Course Project, Final Exam
Employ a range of skills and techniques focused on the implementation of solutions for different engineering problems in the field of the propulsion systems of automotive vehicles. [10SO1, 10SO4, 10SO6, 10SO7] [10L7S1, 15L7C2, 15L7C4]	40%	First Exam, Assignments and Quizes, Course Project, Final Exam
Develop a broad range of students? skills and knowledge to be able to understand, recognize, and solve complex issues in vehicle propulsion system as a part of the challenging automotive industry. [5SO1, 5SO2, 5SO4, 5SO7] [10L7S1, 5L7C2, 5L7C4]	20%	First Exam, Course Project, Final Exam

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
35	15		15		20	15

Relationship to NQF Outcomes (Out of 100%)					
L7K1	L7S1	L7S3	L7C1	L7C2	L7C4
10	30	10	10	20	20

Evaluation	
Assessment Tool	Weight
First Exam	25%
Assignments and Quizes	10%
Course Project	25%
Final Exam	40%

Policy	
Course Evaluation Policy	Assignments, Quizes 10% Experiment 0% 1st Exam 25% project 25% Final Exam 40%

University Policy

- Attendance is mandatory. Any student who misses 20% of the class will be barred from class.
- Late student will be considered absent.
- No cell phones are allowed during class.
- All cell phones should be turned OFF during exams.

Date Printed: 2023-11-27