Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Mechanical Engineering Department
2021-2022 Spring Semester

Syllabus

Code/Name	SEC 202.3 / Introduction to Automotive Engineering
Type	Elective
Credit/ECTS	4/4
Hour per Week	4 (2+2+0)
Level/Year	Undergraduate/2
Semester	Spring
Classroom	Th Th F F | A108 A108 A103 A103
Content	Engine characteristics. Vehicle performance. Resistances to motion. Maximum speed and acceleration performance. Calculation of fuel consumption. Power train: clutch, gearbox, gear ratios, propeller shaft, universal and constant velocity joints, differential, differential ratio, drive shafts. Brakes: basic requirements, directional stability, weight transfer, brake force distribution. Modern trends in automotive engineering.
Prerequisites	MEC 203 Dynamics
Textbooks	***Primary*** Class Notes ***Supplementary*** Sakthivel et al, Introduction to Automotive Engineering, Wiley, 1st Ed., 2019. B Lenzo, Vehicle Dynamics: Fundamentals & Ultimate Trends, Springer, 1st Ed., 2021. TD Gillespie, Fundamentals of Vehicle Dynamics, SAE, 1st Ed., 1992. GK Awari et al., Automotive Systems: Principles & Practice, CRC Press, 1st Ed., 2021. I Husain, Electric & Hybrid Vehicles: Design Fundamentals, CRC Press, 3rd Ed., 2021.
Objectives	• To classify various vehicular systems and vehicle layouts • To examine the objectives of vehicle design • To summarize the developments in BEV, HEV, and FCV technologies
Course Outcomes	In this course you will be able to: CO1 Classify vehicles and distinguish the components of a vehicle CO2 Relate subsystems of vehicular engines CO3 Examine the working principles of clutches, transmissions, and differentials CO4 Analyze longitudinal motion of a vehicle CO5 Appraise the performance of braking and steering systems C06 Examine the components of BEV, HEV and, FCV systems

Weekly Schedule of Topics

W	Topic
1	Vehicle classification
2	Vehicular engines
3	Automotive clutches
4	Manual and automatic transmissions
5	Differential, propeller shaft
6	Vehicle longitudinal motion
7	Suspension systems
8	Braking systems
9	Wheels and tires

10	Steering systems
11	Vehicle aerodynamics
12	Battery electric, hybrid electric and fuel cell vehicles
13	Battery electric, hybrid electric and fuel cell vehicles
14	Autonomous drives

Professional Contribution	Ability to classify ground vehicles and to evaluate components of a vehicle

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	0	1	3	2	0	3	4	0	0
CO2	2	3	0	1	1	2	0	1	0	0	0
CO3	3	4	0	1	1	2	0	1	0	3	0
CO4	5	4	0	3	5	5	0	1	0	3	0
CO5	5	4	0	1	4	2	0	1	0	0	0
CO6	3	3	0	1	4	5	4	3	5	0	3

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions	The consequence of violation of the attendance rule is to receive a grade of **DZ.**
Requirements	Basic knowledge of Matlab
Course Policy	1. You must attend at least 75% of the sessions including add-drop period. 2. Be in the class on time. 3. English should always be used to communicate with one another. 4. Mobile phone should be switched off and put away during the class. 5. You cannot talk to your friends during class no matter what the subject is.
Cheating & Plagiarism	• Copying or letting someone to copy your work on exams, assignments, or reports is cheating. • Cutting and pasting text, figures and tables from the web sources or any other electronic source is plagiarism. • The consequence of academic dishonesty is to receive a grade of **FF** for the course.
Evaluation	Midterm Exam 40% Presentation 10% Final Exam 50% Total 100%
Rubric	A rubric will be announced after the exams based on the details of the answer keys. A rubric will be announced prior to presentation sessions. The rubric has 2 main parts for the grading: technical assessment (50%) and writing or presentation performance (50%)

Instructor

Name/Surname	Akın Oktav	Email	akin.oktav@alanya.edu.tr
Room	209	Office Hours	M 14.30-15.30 | Th 16.00-17.00

Prepared by Akın Oktav on January 18th, 2022