

Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Mechanical Engineering Department
2024-2025 Spring Semester
SYLLABUS

Code/Name	SEC 302.1 / Energy Efficiency
Type	Required
Credit/ECTS	3/3
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/2
Semester	Spring
Classroom	D204, A203
Content	Introduction to energy efficiency. Energy management and audit. Billing rate structures. Cogeneration. Boilers and steam systems. Heat recovery systems. Thermal insulation. Energy consumption in buildings. Electric motors. Compressors and compressed air lines. Lighting systems and home appliances. Economic and environmental considerations.
Prerequisites	
Textbooks	Primary M Kanoğlu, YA Çengel, Energy Efficiency and Management for Engineers, McGraw-Hill, 2020. Supplementary B.L. Capehart, W.C. Turner and W.J. Kennedy, <i>Guide to Energy Management</i> , 7 th edition, Fairmont Press, Inc., 2011.
Objectives	<ul style="list-style-type: none">• To develop an intuitive understanding of energy management principles, energy audit methods, and billing rate structures.• To analyze energy and cost savings potential associated with insulation, heating and cooling of buildings, boilers, cogeneration, and heat recovery systems.• To analyze energy and cost savings potential associated with electrical equipment such as compressors, motors, lighting systems, and home appliances.
Course Outcomes	In this course you will be able to: C01 Describe various methods of energy efficiency. C02 Describe principles and methods of energy management and audit. C03 Identify various heating and cooling systems for buildings and compare their characteristics. C04 Analyze energy savings potential associated with various energy efficiency applications. C05 Analyze cost savings potential associated with various energy efficiency applications. C06 Identify effects of energy efficiency and management on the environment.

Weekly Schedule of Topics

W	Topic
1	Energy management and audit
2	Billing rate structures
3	Cogeneration
4	Boilers
5	Boilers
6	Steam systems
7	Heat recovery systems
8	Thermal insulation
9	Building energy consumption

10	Building energy consumption
11	Heating and cooling systems in buildings
12	Electric motors
13	Compressors
14	Lighting systems

Professional Contribution Ability to understand, analyze, and assess the performance of internal combustion engines

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C01	0	0	0	0	0	0	0	0	4	0	0
C02	0	0	0	0	0	0	0	0	4	0	0
C03	0	0	0	0	0	0	0	0	4	0	0
C04	5	0	0	0	4	0	0	0	0	0	0
C05	5	0	0	0	4	0	0	0	0	0	0
C06	0	0	0	0	0	5	0	0	3	0	0

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

Special Conditions • Students work in groups for project and presentations.

Requirements

Evaluation	Midterm Exam	40%
	Quizzes	15%
	Final Exam	45%
	Total	100%

Rubric

Course Policy

1. Students are required to attend at least 70% of the theoretical courses and 80% of the courses with lab/application sessions including add-drop period. Otherwise, you will receive a grade of DZ. Health reports, and other official or nonofficial excuses are not accepted.
2. Be in the class on time. Late attendance may result in grade deductions.
3. English should always be used to communicate in the class.
4. Mobile phones should be switched off and put away during the class.
5. Illegal copies of the textbooks and other illegal course materials cannot be used for the classwork and exams.
6. Exam papers can only be checked within one week of grade announcement.

Cheating & Plagiarism

- Copying or letting someone copy your work on exams, assignments, or reports is cheating.
- Cutting and pasting text, figures and tables from web sources or any other electronic source is plagiarism.
- A consequence of academic dishonesty is to receive a grade of FF for the course.

Instructor

Name/Surname	Mehmet Kanoglu	Email	mehmet.kanoglu@alanya.edu.tr
Room	228	Office Hours	Tuesday: 13:15 – 14:15 Thursday: 16:15 – 17:15

Prepared by Mehmet Kanoğlu