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

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| **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** | T-206 |
| **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***<br>M Kanoğlu, YA Çengel, Energy Efficiency and Management for Engineers, McGraw-Hill, 2020.<br>***Supplementary***<br>B.L. Capehart, W.C. Turner and W.J. Kennedy, *Guide to Energy Management*, 7th edition, Fairmont Press, Inc., 2011. |
| **Objectives** | • To develop an intuitive understanding of energy management principles, energy audit methods, and billing rate structures.<br>• To analyze energy and cost savings potential associated with insulation, heating and cooling of buildings, boilers, cogeneration, and heat recovery systems.<br>• 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:<br>CO1 Describe various methods of energy efficiency.<br>CO2 Describe principles and methods of energy management and audit.<br>CO3 Identify various heating and cooling systems for buildings and compare their characteristics.<br>CO4 Analyze energy savings potential associated with various energy efficiency applications.<br>CO5 Analyze cost savings potential associated with various energy efficiency applications.<br>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 |

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

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| **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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 |
| CO2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 |
| CO3 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 |
| CO4 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CO5 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CO6 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 5 | 0 | 0 |

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

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| **Special Conditions** | • Students work in groups for project and presentations. | |
| **Requirements** | | |
| **Evaluation** | Midterm Exam | 30% |
| | Quizzes | 20% |
| | Final Exam | 50% |
| | Total | 100% |
| **Rubric** | | |
| **Course Policy** | 1. You must attend at least 70% of the sessions including add-drop period. Otherwise, you will receive a grade of DZ.<br>2. Be in the class on time.<br>3. English should always be used to communicate with one another.<br>4. Mobile phone should be switched off and put away during the class.<br>5. Illegal copies of the textbooks and other illegal course materials cannot be used for the classwork and exams. | |
| **Cheating & Plagiarism** | • Copying or letting someone to copy your work on exams, assignments, or reports is cheating.<br>• Cutting and pasting text, figures and tables from the web sources or any other electronic source is plagiarism.<br>• A consequence of academic dishonesty is to receive a grade of FF for the course. | |

**Instructor**


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| Name/Surname | Mehmet Kanoglu | Email | mehmet.kanoglu@alanya.edu.tr |
| Room | 121 | Office Hours | Tuesday: 12:30 – 13:30<br>Thursday: 16:30 – 17:30 |


Prepared by Mehmet Kanoğlu on Jan. 26, 2022