Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Mechanical Engineering Department

**SYLLABUS**

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| **Code/Name** | MCE 406.1 / Energy Efficiency and Management |
| **Type** | Technical Elective |
| **Credit/ECTS** | 3/5 |
| **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 |
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| 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 | 0 | 0 | 4 | 0 | 0 |
| CO2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| CO3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| CO4 | 5 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| CO5 | 5 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| CO6 | 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

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| **Special Conditions** | • Students work in groups for project and presentations. |
| **Requirements** | |
| **Evaluation** | Midterm Exam 40%<br>Quizzes 15%<br>Final Exam 45%<br>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.<br>2. Be in the class on time. Late attendance may result in grade deductions.<br>3. English should always be used to communicate in the class.<br>4. Mobile phones 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.<br>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.<br>• Cutting and pasting text, figures and tables from 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 | 228 | Office Hours | |


Prepared by Mehmet Kanoğlu