

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGIES
COURSE SYLLABUS

| Course Details | | | | | |
|---------------------------------------|---|----------|-----------------|----------------------|---------------------|
| Code | | | | Academic Year | Semester |
| EBT406 | | | | 3 | 6 |
| Title | T | A | L | ECTS | |
| Energy Management | 3 | 2 | 0 | 6 | |
| Language | German | | | | |
| Level | Undergraduate | X | Graduate | | Postgraduate |
| Department / Program | Energy Science and Technology | | | | |
| Forms of Teaching and Learning | Face-to-face | | | | |
| Course Type | Compulsory | | Elective | X | |
| Objectives | The Energy Management course aims to enable students to understand management processes, analytical methods, and their impacts on energy systems to ensure the efficient and sustainable use of energy resources. This course addresses the applications of energy management processes in industrial, commercial, and individual contexts, aiming to equip students with the ability to save energy, reduce costs, minimize environmental impacts, and make decisions aligned with sustainable development principles. | | | | |
| Content | This course covers the fundamental concepts, methods, and applications related to energy management. The content is supported by both theoretical knowledge and practical examples to develop students' analytical thinking and problem-solving skills. | | | | |
| Prerequisites | None | | | | |
| Coordinator | Dr. Aslı İşler Kaya | | | | |
| Lecturer(s) | Dr. Aslı İşler Kaya | | | | |
| Assistant(s) | Res. Asst. Anıl Can Duman | | | | |
| Work Placement | None | | | | |
| Recommended or Required Reading | | | | | |
| Books / Lecture Notes | B.L.Capehart, W.C.Turner,W.J. Kennedy, "Guide to Energy Management," Fairmont Press, 7th edition, 2012. Guide to Energy Management, https://research.iaun.ac.ir/pd/moradian/pdfs/UploadFile_4420.pdf | | | | |
| Other Sources | S.Doty, W.C.Turner, Energy Management Handbook,Fairmont Press, 2009. F.Kreith, D.Y.Goswami, Energy Management and Conversation Handbook, CRC Press, 2008. | | | | |
| Additional Course Material | | | | | |
| Documents | | | | | |
| Assignments | 1 Project | | | | |
| Exams | 1 Midterm + 1 Final | | | | |
| Course Composition | | | | | |

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| | | |
|--------------------------------|----|---|
| Mathematics and Basic Sciences | | % |
| Engineering | 20 | % |
| Engineering Design | 20 | % |
| Social Sciences | | % |
| Educational Sciences | | % |
| Natural Sciences | 20 | % |
| Health Sciences | | % |
| Expert Knowledge | 40 | % |

Assessment

| Activity | Count | Percentage (%) |
|--------------|-------|----------------|
| Midterm Exam | 1 | 30 |
| Quiz | | |
| Assignments | | |
| Attendance | | |
| Recitations | | |
| Projects | 1 | 30 |
| Final Exam | 1 | 40 |
| Total | | 100 |

ECTS Points and Work Load

| Activity | Count | Duration | Work Load (Hours) |
|------------------------------------|-------|----------|-------------------|
| Lectures | 14 | 3 | 42 |
| Self-Study | 13 | 4 | 52 |
| Assignments | | | |
| Presentation / Seminar Preparation | | | |
| Midterm Exam | 1 | 2 | 2 |
| Recitations | 14 | 2 | 28 |
| Laboratory | | | |
| Projects | 6 | 7 | 42 |
| Final Exam | 1 | 2 | 2 |
| Total Work Load | | | 168 |

ECTS Points (Total Work Load / Hour)

6

Learning Outcomes

| | |
|---|--|
| 1 | Students can explain the fundamental concepts of effective and efficient energy resource management and integrate these concepts into real-world applications. |
| 2 | Students can conduct energy consumption analyses and develop sustainability and efficiency strategies in energy management processes. |

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|---|---|
| 3 | Students can compare different energy management systems and propose suitable energy management models for businesses and institutions. |
| 4 | Students can analyze national and international legal regulations related to energy management and develop policy and strategy recommendations. |
| 5 | Students can design energy-saving system solutions using innovative technologies in energy management and evaluate the economic impacts of these solutions. |

Weekly Content

| | |
|----|---|
| 1 | Energy resources and energy systems |
| 2 | Measurement techniques and methods |
| 3 | Energy management processes and standards |
| 4 | Energy regulations and policies |
| 5 | Optimization and forecasting methods |
| 6 | Energy management in buildings |
| 7 | Energy management in electric vehicles |
| 8 | Midterm exam |
| 9 | Energy conservation and energy efficiency |
| 10 | Economic analysis |
| 11 | Life cycle assessment |
| 12 | Practical energy management with software – 1 |
| 13 | Practical energy management with software – 2 |
| 14 | Practical energy management with software – 3 |
| 15 | Project presentations |
| 16 | Final exam |

Contribution of Learning Outcomes to Program Objectives (1-5)

| | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 |
|---|----|----|----|----|----|----|----|----|----|
| 1 | 4 | 4 | 5 | 3 | 5 | 5 | 4 | 3 | 4 |
| 2 | 5 | 5 | 5 | 3 | 5 | 4 | 4 | 3 | 5 |
| 3 | 5 | 5 | 4 | 3 | 4 | 4 | 5 | 3 | 4 |
| 4 | 4 | 5 | 5 | 3 | 5 | 4 | 4 | 4 | 4 |
| 5 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 4 |

Contribution Level 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

<https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=EN&curSunit=5706>

Compiled by: Dr. Aslı İşler Kaya

Date of Compilation: 24.01.2024