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| **Óbuda University** | | | | | | | | | | | | | | | | | | | |
| Light Industry and Environmental Engineering | | | | | | | | | | Faculty | Environmental Engineering and Science | | | | | | | | Institute |
| Course name: | | | | Alternative energy usage in practice I. (System of energetics, transport and residential application) | | | | | | | | | | Neptun-code: | | | RKWAE1EBNE | | |
| Course name in Hungarian: | | | | Energetikai alapismeretek | | | | | | | | | | Credit: | | | 6 | | |
| Type (compulsory/optional:) | | | | | | Compulsory | | Programme: | | | Full time | Semester: | | | | | | 6th | |
| Majors, where course is held: | | | | | | | Environmental Engineer | | | | | | | | | | | | |
| Course coordinator: | | | **Konrád Lájer Dr.** | | | | | | *Lecturer:* | | | | | | **Norbert Berecz** | | | | |
| Required preliminary knowledge: | | | | | | |  | | | | | | | | | | | | |
| Weekly lectures: | | | Lecture: | | 2 | | Classroom work: | | | | 2 | | Laboratory: | | | - | | | |
| Exam type: | | | | | e | | Course language: | | | | English | | Course in the major’s curriculum: | | | Differentiated professional knowledge | | | |
| **Curriculum** | | | | | | | | | | | | | | | | | | | |
| Aim: | | | | | | | | | | | | | | | | | | | |
| The aim of the course is for students to get to know alternative energy systems, their most important properties, to study the  operation of certain systems. In the subject, students will learn about alternative energy sources for operation  with their terms.  They gain insight into energy conversion systems, the relationship between energy and the environment. The  familiarize yourself with the procedures that occur in environmental engineering practice within the basic systems of energy use  and the conditions of their application in Hungary. The subject of the course is energy systems  getting to know the applications that appear in practice. | | | | | | | | | | | | | | | | | | | |
| **Detailed description of the course, schedule:** | | | | | | | | | | | | | | | | | | | |
| **Lecture and classroom work topics**: | | | | | | | | | | | | | | | | | | | |
| Week | Topic | | | | | | | | | | | | | | | | | | |
| 1. 2025.02.17. | | Description of semester requirements.  Introduction to residential energy use (and production).  Elements of residential energy use. | | | | | | | | | | | | | | | | | |
| 2. 2025.02.24. | | Comparison of energy sources typical for residential use. | | | | | | | | | | | | | | | | | |
| 3. 2025.03.03. | | Modes of non - industrial renewable heat (energy) production.  Solar: Solar panels, collectors; Latent heat recovery (heat pumps); Biomass  based systems (biogas reactor; energy grass-wood-wood waste solutions). | | | | | | | | | | | | | | | | | |
| 4. 2025.03.10. | | Working principle of photovoltaic systems. Solar cell varieties and their effectiveness.  Methods of energy storage (recharging, storage). | | | | | | | | | | | | | | | | | |
| 5. 2025.03.17. | | Non-renewable modern heating systems (gas, wood / coal gasification boilers,  electric heating panels).  Options for reducing heat emissions (housing insulation methods).  Coordination of tasks to be submitted. Presentation by Iceland. | | | | | | | | | | | | | | | | | |
| 6. 2025.03.24. | | Modern lighting systems. The LED as a light source. Structure of modern "white-light" LEDs, their operating principle.  Home control, energy saving methods. Remote monitoring of flats and its modern equipment. | | | | | | | | | | | | | | | | | |
| 7. 2025.03.31. | | Mid-term test | | | | | | | | | | | | | | | | | |
| 8. 2025.04.07. | | Smart homes | | | | | | | | | | | | | | | | | |
| 9. 2025.04.14. | | Energy sources and technical solutions in transport, from the industrial revolution to the present day (steam, petrol, diesel) | | | | | | | | | | | | | | | | | |
| 10. 2025.04.21. | | Rector’s break, Easter holiday | | | | | | | | | | | | | | | | | |
| 11. 2025.04.28. | | The history of electromobility from its beginnings to the present day. In practice, what makes a technical solution competitive? | | | | | | | | | | | | | | | | | |
| 12. 2025.05.05. | | The electric car nowadays, opportunities, difficulties. How to be competitive with internal combustion engines? | | | | | | | | | | | | | | | | | |
| 13. 2025.05.12. | | Renewable energy in public transport | | | | | | | | | | | | | | | | | |
| 14 2025.05.19. | | Presentations by students, closure of the semester | | | | | | | | | | | | | | | | | |
| **Mid-term requirements** | | | | | | | | | | | | | | | | | | | |
| Participation in classes: | | | | | | | | | | | | | | | | | | | |
| Active listening and participation in the lectures and classroom works. | | | | | | | | | | | | | | | | | | | |
| **Method of obtaining the signature:** | | | | | | | | | | | | | | | | | | | |
| Conditions for obtaining a signature:  - participation in the practice / laboratories, absences may be allowed according to the SRS. of Óbuda University, both in terms of the lecture and the practice / laboratory, according to SRS. of Óbuda University.  - One successful *Mid-term test* from the semester topics (min. requirement 61% of each).  - Dissemination of their individual research work with a presentation.  A student who has not written the Mid-term tests or its replacements and / or has reached the limit of absence allowed by the SRS. will receive a Blocked entry.  Replacement of the signature beyond the diligence period is possible in the **Signature Replacement Exam**, the method of which is provided for by the SRS. of Óbuda University. | | | | | | | | | | | | | | | | | | | |
| *Method of obtaining the signature:* | | | | | | | | | | | | | | | | | | | |
| The condition for a successful semester is the completion of the exam at least at a sufficient level. The exam can be organized in a written/oral form.  The grades are formed according to the following percentage distribution:  0-60%: insufficient (1)  61-70%: sufficient (2)  71-81%: medium (3)  81-90%: good (4)  91-100%: significant (5) | | | | | | | | | | | | | | | | | | | |
| **Literature** | | | | | | | | | | | | | | | | | | | |
| Compulsory: | | |  | | | | | | | | | | | | | | | | |
| Recommended | | | Gyorgy Elmer, Dr. – Electrical Power Engineering I. – University of Pécs, Faculty of Electrical Engineering | | | | | | | | | | | | | | | | |
| **Course quality assurance methods:** | | | | | | | | | | | | | | | | | | | |
| The subject has an annual teacher review, which considers the effectiveness of knowledge transfer and the information obtained from the evaluation of the opinions given by students and graduates. Based on the evaluation, development actions related to the subject can be launched, the areas of which  - knowledge transfer methodology,  - the content of the curriculum,  - the interdependence of lectures and exercises.  We make an annual evaluation of the changes and their results, make a note of this and make the proven elements part of the subject program with a schedule organized by the supervisor. | | | | | | | | | | | | | | | | | | | |