Nazwa w jęz. angielskim: PBL - Applied energy technology (Challenge based project)

Dane dotyczące zajęć:
Information on course:

Jednostka oferująca: Wydział Inżynierii Środowiska i Energetyki // dr inż. Marcin Landrat
Course offered by: Faculty of Energy and Environmental Engineering // dr inż. Marcin Landrat

Język wykładowy:
angielski
Language:
English
Strona WWW: **Course homepage:**
Skrócony opis:
Short description:
This module course will gives students the skills to conduct a feasibility analysis, identify financial requirements, and complete perspective of solving real engineering problems. Students are set real-world challenges by industrial partners, which enhance both problem-solving skills and awareness of all the technological, environmental and economic factors involved in the decision-making process, and how they interact together.
Opis:
Description:
The module is designed in challenge driven education style with elements of project based learning. The whole group of students receive the common challenge. During first classes the challenge is detailed discussed and the KPIs are established. Then the whole group is divided in to working groups (teams) and the leaders are nominated together with the leader of the whole group (project manager). Teams are solving the same problem independently. Finally the challenge solution is delivered by all teams and is compared with each other. In addition all teams should deliver SWOT analysis and feasibility study. The pitches on elaborated solutions is delivered by all teams. This makes the internal competition between teams. The comparison is made on the basis of defined previously KPIs. Finally the whole group is creating the common report with clearly indicated responsibility parts. The common conclusions and executive summary is crated on the basin of contribution of all teams and finally delivered by project manager. The solution relevant to the challenge should be assessed valued to all relevant stakeholders. The course is conducted in cooperation with industrial partners. This module is designed in a form of a laboratory/project conducted by teams under the leadership of project management and is focused on solving the real program (challenge). The challenge is always related to the issue which is important to the industry, society and economy. The main objective is to deepen the making value judgments skills and the knowledge already gained in other modules of the program, shape the multidimensional thinking taking into account technological, economic, environmental and social issues and implement analytic skills, making value judgments together with the art of presentation, discussion and shaping teamwork skills. The module improves skills in gathering information in a real life situations on needs to be covered and problems to be solved. **Number of hours of classes with direct participation of academic teachers or other persons teaching courses and students** **Laboratories: 45 h** **Number of ECTS credits: 6**
Literatura:
Bibliography:

1. Scientific journals available in university network (Scopus, Science direct etc.)
2. Documents related to the challenge delivered by industrial partner

Efekty uczenia się:

Learning outcomes:

Knowledge
Student knows and understands:
K2A_W10 demonstrates broad knowledge of technologies used in conventional and nuclear power engineering

Skills
Student can:
K2A_U04 prepares and presents, both in Polish and in a foreign language, an oral presentation regarding detailed concepts in the field of power engineering
K2A_U06 demonstrates linguistic skills which meet the requirements for B2+ level of the English language and A1 of a second foreign language, as specified in the Common European Framework of Reference for Languages; demonstrates the skills of using English specialist terminology in the field of power engineering
K2A_U10 formulates and tests hypotheses related to engineering problems and basic research problems in the field of power engineering
K2A_U14, K2A_U25 prepares documents of a report/article type, which present results of his/her own analyses formulates and solves an engineering problem and a basic research problem in the area of the studied programme

Social competences
Student is prepared to:
K2A_K02 is aware of the importance of understanding non-technical aspects and effects of an engineer's work, including its impact on the environment and responsibility for the decisions taken in this respect

Metody i kryteria oceniania:

Assessment methods and assessment criteria:

Grading: from 2 to 5
Where:
- Grade: 2 – Student fails to demonstrate any evidence of the learning outcomes. He/she didn't provided sufficient number of correct answers in the final tests and consequently didn't collected sufficient numbers of points. He/she is not able to provide correct oral answers to questions he/she is asked. He/she didn't participated in case teaching by taking part in the discussions, giving comments nor by solving tasks. He/she failed to complete project assignments and didn't submit a report with correct solution.
- Grade: 3 – Student demonstrates limited evidence of the learning outcomes. Student sufficiently understands social, economic, legal and other non-technical conditions, is able to incompletely characterise energy storage technologies and processes, is partly aware of possibilities and conditions for system integration of energy storage technologies. Student builds models apply analytical methods and conducts simulations with major difficulties and needs significant teacher's assistance. He/she formulates hypotheses as well as formulates and solves engineering problems with some difficulties. Student weakly demonstrates the skills of using the principles and methods of thermodynamics. Student demonstrates difficulties in team work. Student is able to partly identify consequences of plans and decisions and shows only limited awareness of the relation of value to producers, customers, shareholders, communities, ecological systems, policies. He/she reformulates and applies available ideas to address and solve some of his project challenges.
Student doesn't propose new or improved products, services, processes, policies or new business models, but recognises existing connections among ideas or technologies and innovative solutions. Student shows limited understanding of real-life problems. He/she provided sufficient number of correct answers (50 – 60 %) in the final tests and collected sufficient numbers of points. He/she is able to provide sufficiently correct oral answers to questions he/she is asked. He/she participated in case teaching by taking part in the discussions, giving comments and solving tasks but his activity was low. He/she completed project assignments and submitted a report with correct solution with major faults thus significant corrections were required.
- Grade: 4 – Student demonstrates evidence of the learning outcomes in a good manner. He/she makes only minor errors and is able to correct them with only limited teacher's assistance. Student is able to relate the value proposed in his activity to several relevant stakeholders including producers, customers,

shareholders, communities, ecological systems or policies as appropriate. Student is able to invent or find solutions to address and solve some of his project's challenges. He/she proposes significant improvements to products, services, processes, policies or business models. His work shows understanding of real-life problems related to the district heating and cooling. He/she provided sufficient number of correct answers (60 – 80 %) in the final tests and collected good numbers of points. He/she is able to provide correct oral answers to questions he/she is asked. He/she participated in case teaching by taking part in the discussions, giving comments and solving tasks in a good manner. He/she completed project assignments and submitted a report with correct solution and only minor faults thus significant corrections were not required.
- Grade: 5 – Student excellently demonstrates evidence of the learning outcomes. There are only minor and negligible shortcomings in his performance. He/she provided almost all correct answers (80 – 100 %) in the final tests and collected very good numbers of points. He/she is able to provide correct oral answers to questions he/she is asked and even challenge these questions with new ideas. He/she actively participated in case teaching by taking part in the discussions, giving comments and solving tasks. He/she completed project assignments and submitted a report with correct solution. He/she is able to relate the value proposed in his activity to all relevant stakeholders including producers, customers, shareholders, communities, ecological systems and policies as appropriate. Student is able to invent or find solutions to address and solve his/her project's main challenges. He/she creates/proposes new products, services, processes, policies or entirely new business models that do not yet exist in the market. His/her work is clearly focused and grounded in the information gathered on real life situations and/or student's own experiences about needs to be covered and/or problems to be solved. He/she makes proposals on how results could improve things.

Przynależność do grup przedmiotów w cyklach:
Element of course groups in various terms:

Opis grupy przedmiotów Course group description	Cykl pocz. First term	Cykl kon. Last term
przedmioty obieralne studia stacjonarne i niestacjonarne stopień studiów – dowolny kierunek studiów – dowolny, semestr dowolny elective courses full-time and part-time studies degree - any field of study - any semester - any	2023/2024	