<table>
<tr><td>Course code</td><td></td></tr>
<tr><td>Type and description</td><td>Elective Course</td></tr>
<tr><td>ECTS credit</td><td>1</td></tr>
<tr><td>Course name</td><td>Design of Photovoltaic Systems</td></tr>
<tr><td>Course name in Polish</td><td>Projektowanie sytemów fotowoltaicznych</td></tr>
<tr><td>Language of instruction</td><td>English</td></tr>
<tr><td>Course level</td><td>8 PRK</td></tr>
<tr><td>Course coordinator</td><td>dr hab. inż. Maciej Sibiński, prof. PŁ</td></tr>
<tr><td>Course instructors</td><td>dr hab. inż. Maciej Sibiński, prof. PŁ, dr inż. Katarzyna Znajdek</td></tr>
<tr><td>Delivery methods and course duration</td><td>
<table>
<tr><th></th><th>Lecture</th><th>Tutorials</th><th>Laboratory</th><th>Project</th><th>Seminar</th><th>Other</th><th>Total of teaching hours during semester</th></tr>
<tr><td>Contact hours</td><td>0</td><td>0</td><td>0</td><td>15</td><td>0</td><td>0</td><td>15</td></tr>
<tr><td>E-learning</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td></td></tr>
<tr><td>Assessment criteria (weightage)</td><td></td><td></td><td></td><td>1,0</td><td></td><td></td><td></td></tr>
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<tr><td>Course objective</td><td>The main aim of this course is to acquire knowledge in the field of photovoltaic installations operation, exploitation parameters and computer aided designing methods.</td></tr>
<tr><td>Learning outcomes</td><td>After finishing of this course PhD student is able to:
1. List and describe the advantages of PV application in power supply system – W4, U4.
2. Analyse and construct the energy consumption profile for selected group of devices – U4.
3. Select and adjust the system architecture for proper type, localisation, function and work configuration of PV installation – U4.
4. Analyse the technical parameters of prepared design and calculate achieved emission reduction result – U4, K1.
5. Working in a designer team to prepare the proper project documentation for professional PV installation – U4, K1.</td></tr>
<tr><td>Assessment methods</td><td>Methods of verification:
effects 1-5 - project presentation
The final grade consists of:
Project presentation - 100%</td></tr>
<tr><td>Prerequisites</td><td></td></tr>
<tr><td>Course content with delivery methods</td><td>Project
1. PV installation operation within renewable energy dissipated system.
2. Basic opto-electronic parameters and construction of photovoltaic cells and modules.
3. Work configuration and elements of on-grid and off-grid systems.
4. The PV installation design content and methods of preparation with the help of CAD tools according to the localisation, surrounding and local demands.
5. Legal issues connected with PV installation design.
6. Discussion of the practical design examples and realisations.
7. Analysis of the design accuracy and errors in the designing process.

8. Basic tools for PV installation dimensioning on the basis of the positioning system.
9. Preparation of shadowing profiles and generation results according to the real 3D models.
10. Proper configuration of strings and inverters for optimal energy generation in on-grid and off-grid</td></tr>
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	systems. 11. Calculation of battery capacity for off-grid systems in various conditions. 12. Calculation of the actual energy effectiveness and ecological effect.PROJECT 13. Preparation of complete project documentation. 14. Presentation of individual projects, prepared for indicated technical conditions.
Basic reference materials	1. Lecturer materials, 2. K. Znajdek, M. Sibiński, „Postępy w fotowoltaice", Wydawnictwo Naukowe PWN, Warszawa 2021, ISBN: 978-83-01-21666-5 3. M. Sibiński ,K. Znajdek "Przyrządy i instalacje fotowoltaiczne", Wydawnictwo Naukowe PWN, Warszawa 2016 ISBN:978-83-01-18837-5 4. A. Reinders "Photovoltaic solar energy : from fundamentals to applications". ISBN: 978-1-118-92746-5 2017 5. B. Szymański „Instalacje fotowoltaiczne. Poradnik wydanie VII" Glob Energia, 2018
Other reference materials	
Average student workload outside classroom	15h
Comments	
Last update	20.04.2023