

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Wind power plants		Code 1010311471010326912
Field of study Power Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty Ecological Source of Electrical Energy	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: - Laboratory: - Project/seminars: 15		No. of credits 4
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 4 100% 4 100%
Responsible for subject / lecturer: dr inż. Grzegorz Twardosz email: Grzegorz.Twardosz@put.poznan.pl tel. 61 6652796 Elektryczny ul. Piotrowo 3a, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of renewable energy sources and unconventional sources
2	Skills	Ability to effectively self-study in a field on wind power plants
3	Social competencies	Is aware of the need to broaden their competencies, is ready to work in a team.
Assumptions and objectives of the course: Acquainted with properties and characteristics various solutions wind power plants. Recognize theoretical and practical problems be connected with design, construction and exploitation wind power plants.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Basic knowledge of renewable energy sources and unconventional sources. Recognize and select methods of analysis and testing conversion wind energy - [K_W09++] 2. Orientation in present and latest expertise on development of wind power plants - [K_W20+]		
Skills: 1. Ability to get information from literature and web and other sources in field of wind power plants - [K_U01+] 2. Ability to compare various solutions and tested other methods of work wind power plants - [K_U02+, K_U10+]		
Social competencies: 1. Ability to think and act in the field of influence wind power plants on environment. - [K_K02+] 2. Is able to work alone and in a team - [K_K04+]		
Assessment methods of study outcomes		

<p>Lecture: Asses the knowledge and skills listed on the written form with basic and problematics tasks in the field on wind power plants.</p> <p>Project: -Assesment of the form and content of the project -Favoring systematic progress in the project. Get additional points for the activiti in the classroom particular byabiliti to work within a team.</p>		
Course description		
<p>Technology wind power plants HAWT and VAWT. Build and direct action wind power plants. Assembly and influence wind power plants on environment. Investment in wind power plants.</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Lubośny Z.: Elekrownie wiatrowe w systemie elektroenergetycznym. WNT, Warszawa, 2009. 2. Lewandowski W.: Proekologiczne odnawialne źródła energii. WNT, Warszawa 2012. 3. Chmielniak T.: Technologie energetyczne. WNT, Warszawa 2008. 4. Jastrzębska G.: odnawialne źródła energii i pojazdy proekologiczne. WNT, Warszawa 2009. 5. Lubośny Z.: Farmy wiatrowe w systemie elektroenergetycznym. WNT, Warszawa 2013. 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Krawiec F.: Energia. Wyd. Dyfin, Warszawa 2012. 2. Niedziółka D.: Rynek energii w Polsce. Wyd. Dyfin, Warszawa 2010. 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Participation in project activies	15	
3. Participation in the consultation on the lecture	5	
4. Take part in the consultation on the project	10	
5. Prepare on the project activiti	10	
6. Implementation on the project	10	
7. Prepare for the completion of the lecture	15	
8. Prepare for the completion of the project activiti	15	
9. Participation in the completion of the project	5	
10. Participation in the completion of the lecture	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	102	4
Contact hours	54	2
Practical activities	27	1