

COURSE DESCRIPTION CARD		
The name of the course/module ENERGY-SAVING ARCHITECTURE		Code A_K_1.6_016
Main field of study ARCHITECTURE	Educational profile (general academic, practical) general academic	Year / term III/6
Specjalization	Language of course: Polish	Course (core, elective) core
Hours Lectures: 15 Classes: - Laboratory classes: - Projects / seminars: -		Number of points 1
Level of qualification: I	Form of studies (full-time studies/part-time studies) Full-time studies and part-time studies	Educational area(s) Technical Sciences ECTS division (number and %) 1 100%
Course status in the studies' program (basic, directional, other) directional		(general academic, from a different major)
Lecturer responsible for the course/lecturer: dr inż. arch. Marzena Banach e-mail: marzena.banach@put.poznan.pl Faculty of Architecture ul. Nieszawska 13 C, 61 -021 Poznań tel. 61 665 32 60		Lecturer responsible for the course/lecturer: dr inż. arch. Marzena Banach e-mail: marzena.banach@put.poznan.pl Faculty of Architecture ul. Nieszawska 13 C, 61 -021 Poznań tel. 61 665 32 60
Prerequisites defined in terms of knowledge, skills, social competences:		
1	Knowledge:	- Student has explicit, theoretically based knowledge including the most important issues of architectural designing and urban planning, - Student has basic knowledge of development trends in architectural designing and urban planning,
2	Skills:	- Student can acquire information from publications, data bases and other Polish and English sources, can collate, verify and interpret the said information and draw conclusions as well as voice and justify opinions, - Student can identify practical tasks in the scope of architectural designing, assess existing solutions,
3	Social Competences:	- Student is aware of impact of engineering activities upon the environment and liability for environment affecting decisions, - Student correctly identifies and resolves dilemmas in various spatial situations in urban and architectural scale.
Objective of the course:		
<ul style="list-style-type: none"> Becomes familiar students with ecological approach of architecture designing, understood as connection system of urban planning elements, functions, utility processes and constructions, consistent with principle of sustainable development. Becomes familiar students with basic legal regulations (Polish and EU) related to energy-saving buildings and renewable energy sources. Becomes familiar students with principles of designing energy-saving buildings (location, selection of form and materials, partitions parameters). Becomes familiar students with the latest technologies of using renewable energy sources in architecture: geothermy, sun, wind, water, biomass and installations supporting energy-saving buildings. 		
Learning outcomes		
Knowledge:		
W01	Student has explicit, theoretically based knowledge including the key issues of energy-saving architecture,	AU1_W01
W02	Student knows the basic methods, techniques and tools in the scope of architectural designing of energy-saving facilities,	AU1_W02
W03	Student has basic knowledge of development trends in architectural designing and urban planning in the context of sustainable development idea,	AU1_W03

W04	Student has basic knowledge of potential and contemporary ways of using renewable energy sources in architecture.	AU1_W04
Skills:		
U01	Student can acquire information from publications, data bases and other Polish and English sources, can collate, verify and interpret the said information and draw conclusions as well as voice and justify opinions;	AU1_U01
U02	Student can identify practical tasks in the scope of architectural designing, assess existing solutions,	AU1_U02
U03	Student can identify renewable energy sources and ways of using them in architecture.	AU1_U03
Social competences:		
K01	Student is aware of the importance of design activity and understand its non-technical aspects, in this impact upon the environment and liability for environment affecting decisions,	AU1_K01
K02	Student correctly identifies and resolves dilemmas in various spatial situations in urban and architectural scale.	AU1_K02
The evaluation methods:		
Formative assessment:		
<ul style="list-style-type: none"> course credit is conditional on participation in lectures (minimum 2/3 attendance) and positive credit of test. 		
Final grading scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0		
Summative assessment:		
<ul style="list-style-type: none"> a series of lectures ends with test (in descriptive and drawing form), containing contents presented during lectures. There are proposed two tests in session, but the second term is resit test. 		
Final grading scale: 3,0; 3,5; 4,0; 4,5; 5,0		
Positive grade for module depends on achieved by student all learning outcomes specified in the syllabus.		
Course contents		
Lectures		
<ul style="list-style-type: none"> Polish law and law of European Union in the aspects of energy-saving building engineering and using renewable energy sources. Systematics of basic concepts. Discussion of selected examples. Principles of ecological approach in designing energy-saving architecture. Designing building development: orientation, form, surrounding, development, glass surfaces, thermal insulation. Selection of housing materials of energy-saving architectural building (including greenery). Potential use of renewable energy sources in Poland. Using geothermal energy, principles of architectural designing: area development, application of heat recovery systems. Principles of designing architectural space with using solar energy (passive and active solar systems) or impact limitations of sunrays. Methods of using wind as an energy source (turbine, power station next to house) to ventilation of premises inside buildings ("breathing" building) and protection methods of architectural buildings against wind. Acquisition systems of energy from water (water turbines) and installations of recovery of rainwater and consumed water (sullage) in architectural facilities. Installations supporting energy-saving buildings using biomass and energy-saving solutions of illumination in architectural facilities. Integrated and non-integrated management systems of installations in building. 		
Basic bibliography:		
Baranowski A., Projektowanie zrównoważone w architekturze, Wyd. Pol.Gdańska,Gdańsk,1998.		
Feist W., Podręcznik podstawy budownictwa pasywnego, Wyd. Polskiego Instytutu Budownictwa Pasywnego, Gdańsk, 2012.		
Guzowski M., Towards zero-energy architecture. New solar design., Laurence King Publ., London, 2010.		
Herzog T., Solar Energy In Architecture and Urban Planning, Prestel,Munich-New York,1996.		
Zimny J., Odnawialne źródła energii w budownictwie niskoenergetycznym, Polska Geotermalna Asocjacja, Warszawa-Kraków,2010.		
Supplementary bibliography:		
"Agenda 21"		
Majerska-Pałubicka B., Rozwiązania energooszczędne w architektonicznym projektowaniu obiektów handlowych, Pol. Śląska, Gliwice, 2001.		
Naciążek B., Piotrowski R., Jak zbudować dom energooszczędny i skorzystać z dopłaty, Wyd. Przewodnik Budowlany, 2013.		
Wnuk R., Instalacje w domu pasywnym i energooszczędnym, Wyd. Przewodnik Budowlany, 2007.		
Wines J., Zielona architektura,Wyd.Taschen,Köln,2008.		

The student workload		
Form of activity	Hours	ECTS
Overall expenditure	27	1
Classes requiring an individual contact with teacher	17	-
Practical classes	0	-

Balance the workload of the average student

Form of activity	Number of hours
participation in lectures	15 h
participation in classes/ laboratory classes (projects)	-
preparation for classes/ laboratory classes	-
preparation to colloquium/final review	-
participation in consultation related to realization of learning process	-
preparation to the exam	10 h
attendance at exam	2 h

Overall expenditure of student: **1 ECTS credit** **27 h**

As part of this specified student workload:

- activities that require direct participation of teachers: **1 ECTS credit**