

Geothermal power engineering

Faculty of	Mechanical and Power Engineering
Name in English	Geothermal power engineering
Name in Polish	Energetyka geotermalna
Main field of study	Power Engineering
Specialization	-
Level of studies	II level
Form of studies	full-time
Kind of subject	optional-specialization
Subject code	W09ENG-SM2356
Group of courses	NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15	15			
Number of hours of total student workload (CNPS)	25	25			
Form of crediting	Crediting with grade	Crediting with grade			
For group of courses mark final course with (X)					
Number of ECTS points	1	1			
including number of ECTS points for practical (P) classes		1			
including number of ECTS points for direct teacher-student contact (BU) classes	0,68	0,68			

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1.	Basic knowledge in the field of chemistry, physics and thermodynamics.
2.	Basic knowledge related to the construction and operation of power plants.

SUBJECT OBJECTIVES

C1	Acquisition knowledge, taking into account aspects of its application, in the field of: <ul style="list-style-type: none"> ▪ nature, classification and exploration of geothermal resources, ▪ geothermal energy utilization.
C2	Development of ability to identify and solve practical problems and issues related to the geothermal power.

SUBJECT LEARNING OUTCOMES

relating to knowledge:	
PEU_W01	Has knowledge related to the exploration, development and utilization of geothermal resources.
PEU_W02	Has knowledge regarding geothermal district heating and power generating systems.
relating to skills:	
PEU_U01	Has ability to apply an integrated knowledge to solving practical tasks in geothermal energy exploration, development and utilization.

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	The scope and course completion conditions. Introduction to geothermal energy. History and development of geothermal energy.	1
Lec 2	Structure of the Earth. Mechanism for geothermal heat flow.	2
Lec 3	Model of geothermal system. Classification of geothermal resources.	2
Lec 4	Strategies and techniques in geothermal energy exploration.	2
Lec 5	Geothermal well drilling.	2
Lec 6	Geothermal energy utilization. Direct use of geothermal energy.	2
Lec 7	Indirect use of geothermal energy. Geothermal power generating systems.	2
Lec 8	Colloquium.	2
Total hours		15

classes		Number of hours
Cl 1,2	Solving practical tasks related to the exploration and development of geothermal resources.	3
Cl 3	Solving practical tasks related to the exploitation of geothermal district heating systems.	2
Cl 4,5	Solving practical tasks related to the exploitation of dry steam geothermal power plants.	4
Cl 6,7	Solving practical tasks related to the exploitation of single-flash geothermal power plants.	4
Cl 8	Colloquium.	2
Total hours		15

TEACHING TOOLS USED	
N1	Multimedia presentation.
N2	Solving practical task and results discussion.
N3	Consultations.
N4	Student's own work – preparation for colloquium.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F– forming (during semester), C– concluding (at semester end))	Educational effect number	Way of evaluating educational effect achievement
C	PEU_W01 ÷ PEU_W02	Colloquium
C	PEU_U01	Colloquium

PRIMARY AND SECONDARY LITERATURE

Primary literature	
1	Harsh G., Sukanta R., Geothermal energy: an alternative resource for the 21st century, 2007
2	DiPippo R., Geothermal power plants: principles, applications, case studies and environmental impact, 2008
3	Glassley W., Geothermal Energy: Renewable Energy and the Environment, 2010
4	Pierce V., Introduction to Geothermal Power, 2011
5	Wachtel A., Geothermal Energy, 2010
Secondary literature	
1	Quaschnig V., Renewable Energy and Climate Change, 2010
2	Tabak J., Solar and Geothermal Energy, 2009

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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