

COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING		
ACADEMIC UNIT	MINERAL RESOURCES ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	MRE605	SEMESTER	6
COURSE TITLE	ENERGY RAW MATERIALS		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
TOTAL		5	5
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	SPECIAL BACKGROUND		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://eclass.uowm.gr/courses/MRE150/		

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> • identify and describe the various fuels, their properties, their uses as well as the exploration methods for their detection and evaluation. • use his/her knowledge for the development of work plans and decision-making on the exploration and exploitation of energy sources and the protection of the environment.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment
Production of new research ideas	Others...

1. Independent work.
2. Teamwork.
3. Work in interdisciplinary environment.
4. Generation of new research ideas.

(3) SYLLABUS

The course aims to provide the necessary knowledge on issues related to fossil energy sources, their origin, exploration and detection, mining methods, reserves (global and Greek) and the environmental impacts caused by their exploitation. Emphasis is given to the Greek lignite and the energy sector in Greece.

Specifically, the course covers the following thematic areas:

- Fossil fuels (Coal – Oil – Natural Gas).
- Peat – Lignite – Hard coal – Anthracite.
- Bitumen rocks.
- Origin and formation of solid and liquid fossil fuels – Composition – Economic geology – Mining – Uses.
- Radioactive materials (nuclear energy).
- Global reserves.
- Energy balance.
- Environmental impacts.
- Clean combustion technologies.
- Global environmental problems and energy.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face lectures.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Organization and scheduling of the course and the communication with students using the asynchronous e-learning platform 'open eclass'.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	65
	Study on lectures	25
	Laboratory exercises	35
	Total course	125
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	<p>Language of evaluation: Greek</p> <p>Theory: Final written examination, short-answer questions and open-ended questions (50% of the total grade of the course). Laboratory: oral and written examination (50%)</p> <p>The evaluation criteria are given on the relevant page of the course on the asynchronous e-learning platform 'open e-class' and are analyzed to the students at the beginning of the semester.</p>	

(5) SUGGESTED BIBLIOGRAPHY

<p><i>- Suggested bibliography:</i></p> <p><i>Quality characteristics of coals</i> Book Code in Eudoxus: 94646178 Version: 2nd/2020 Authors: Koukouzas N. ISBN: 978-618-5495-10-7 Type: Textbook Publisher: TSOTRAS AN ATHANASIOS</p> <p><i>Energy, Environment and Sustainable Development</i> Book Code in Eudoxus: 94645312 Version: 1st/2020 Authors: Polyzakis Apostolos ISBN: 978-618-83590-6-2 Type: Textbook Publisher: Polyzakis Apostolos & Co. EE</p> <p><i>BEYOND FOSSIL FUELS. THE JOURNEY OF RETURNING TO RENEWABLE ENERGY</i> Book Code in Eudoxus: 68370257 Version: 1st/2017 Authors: ALEXIS LOUKOURGIOTIS, CHRISTOS KORDOULIS, SOTIRIS LYKOURGIOTIS</p>

ISBN: 978-960-524-492-7

Type: Textbook

Publisher: FOUNDATION OF TECHNOLOGY & RESEARCH-UNIVERSITY PUBLICATIONS OF CRETE

Petroleum Geochemistry

Book Code in Eudoxus: 41954964

Version: 1st/2014

Authors: Pasadakis Nikolaos

ISBN: 978-960-418-461-3

Type: Textbook

Publisher: PUBLICATIONS A. TZIOLAS & SONS S.A.

Nuclear Energy and Fossil Fuels

Book Code in Eudoxus: 33133237

Version: A/2013

Authors: Savvidis Elias

ISBN: 978-960-9551-09-0

Type: Textbook

Publisher: COPY CITY I.K.E.

Energy and environment

Book Code in Eudoxus: 31384

Edition: 1st ed./2002

Authors: Tsatiris Michael N.

ISBN: 978-960-402-056-0

Type: Textbook

Publisher: G. DARDANOS - K. DARDANOS G.P.

Climate change policy

Book Code in Eudoxus: 24331

Edition: 1st ed./2010

Authors: Giddens Anthony

ISBN: 978-960-455-807-0

Type: Textbook

Publisher: METAIXMIO PUBLISHING S.A.

Coal exploitation technology

Book Code in Eudoxus: 14752

Edition: 1st ed./2004

Authors: Kolovos Christos I.

ISBN: 978-960-411-450-4

Type: Textbook

Publisher: STELLA PARIKOU & CO

- Related academic journals:

Nature Energy

Energy and Environmental Science

Renewable and Sustainable Energy Reviews

Energy Conversion and Management

Renewable Energy

Green Energy and Environment

International Journal of Electrical Power and Energy Systems

Wind Energy

Energy & Fuels

Sustainable Energy and Fuels

Sustainable Energy Technologies and Assessments
Geomechanics for Energy and the Environment
Energy, Ecology and Environment
Energy Efficiency
Energy Sources, Part B: Economics, Planning and Policy
Geothermal Energy
Journal of Electrochemical Energy Conversion and Storage
Journal of Renewable and Sustainable Energy
Energy Exploration and Exploitation
Energy Sources, Part A: Recovery, Utilization and Environmental Effects
Clean Energy