

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	SCHOOL OF ENGINEERING		
<b>ACADEMIC UNIT</b>	DEPARTMENT OF MINERAL RESOURCES ENGINEERING		
<b>LEVEL OF STUDIES</b>	UNDERGRADUATE		
<b>COURSE CODE</b>	MRE914	<b>SEMESTER</b>	9
<b>COURSE TITLE</b>	Marble and Quarry Materials Exploitation and Processing		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <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>		<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>
LECTURES		2	2
LABORATORY EXERCISES		2	2
<b>TOTAL</b>		4	4
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Specialised knowledge		
<b>PREREQUISITE COURSES:</b>	Surface Mining (MRE501)		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBSITE (URL)</b>	<a href="https://eclass.uowm.gr/courses/MRE181/">https://eclass.uowm.gr/courses/MRE181/</a>		

### (2) LEARNING OUTCOMES

<p><b>Learning outcomes</b></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"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p>The course aims to enable students to</p> <ul style="list-style-type: none"> <li>• Know about the marble and aggregates deposits in Greece</li> <li>• Know the properties and specifications of marbles</li> <li>• Know how to conduct exploration of marble deposits and quarrying materials</li> <li>• Plan the exploitation of marble quarries</li> <li>• Form the marble treatment strategies</li> <li>• Know economic and market data regarding the exploitation of marbles and quarrying materials</li> </ul>

### 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...
	.....

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Adapting to new situations
- Decision-making
- Working independently
- Team work
- Project planning and management
- Respect for the natural environment

### (3) SYLLABUS

Legislative framework for the exploitation of quarries of aggregates and its application today - exploitation methods (drilling geometry, blasting, loading, transport), treatment methods (breakage, separation, products of modern spasterotribe), methods of research and quality control, categories of quarry materials, weathering, health index, slab index, elongation index, specific and apparent weight, mechanical properties of quarrying, tests of British specifications, tests outside British standard (Los Angeles, Deval), resistance to breakage and abrasion.

Methods of exploitation of marbles (of dense parallel perforations, with steel wire, with diamond wire), use of explosive materials. Means of detachment and overturning of the mined volumes, means of handling and loading quarry products. Processing of marbles and decorative stones, products of standard dimensions, processing of healthy marbles, artistic products, storage and distribution of products, utilization of by-products, quality control of marbles, packaging of the final product. Physical-mechanical properties of marbles, specific gravity, water absorption, modulus of elasticity, compression and tensile strength, resistance to abrasion wear, impact resistance, resistance to the effect of dilute acid solutions, thermal expansion coefficient, Knoop micro-hardness.

#### (4) TEACHING and LEARNING METHODS - EVALUATION

<p><b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i></p>	<p>Face-to-face lectures, distance seminars, laboratory exercises on the computer using special mining software</p>	
<p><b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>Use of a projection system, special mining design software installed in computer units of a special laboratory, organization and scheduling of the course and communication with students through the asynchronous e-learning platform open eclass.</p>	
<p><b>TEACHING METHODS</b> <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.</i></p> <p><i>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></p>	<p><b>Activity</b></p>	<p><b>Semester workload</b></p>
	<p>Lectures</p>	<p>28</p>
	<p>Theory study</p>	<p>30</p>
	<p>Laboratory exercises</p>	<p>28</p>
	<p>Project write-up</p>	<p>34</p>
	<p>Course total</p>	<p><b>120</b></p>
<p><b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Final written examination of theory and exercises (60% of the total grade of the course), intermediate written examination of theory (20%), assignments (20%). 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>- Suggested bibliography:</p> <p>Darling, P. (Ed), 2011, <i>SME Mining Engineering Handbook</i>, Society for Mining, Metallurgy and Exploration, 1846 pages</p> <p>Hartman, H.L., 1987, <i>Introductory Mining Engineering</i>, John Wiley &amp; Sons, 633 pages</p> <p>Kennedy, B.A. (Ed), 1990, <i>Surface Mining</i>, 2<sup>nd</sup> Edition, Society for Mining, Metallurgy and Exploration, 1194 pages</p> <p>Παπαγεωργίου, Χ., Ρούμπος, Χ., 2018, <i>Βασικές Μεταλλευτικές Εργασίες στις Υπαίθριες Εκμεταλλεύσεις, Δημόσια Επιχείρηση Ηλεκτρισμού, Γενική Διεύθυνση Ορυχείων</i>, 533 pages</p> <p>Παπαγεωργίου, Χ., Ρούμπος, Χ., 2018, <i>Τεχνολογία και Ολοκληρωμένη Μηχανοποίηση των Επιφανειακών Εκμεταλλεύσεων, Δημόσια Επιχείρηση Ηλεκτρισμού, Γενική Διεύθυνση Ορυχείων</i>, 530 pages</p> <p>- Related academic journals:</p> <p><i>International Journal of Mining Science and Technology</i>, Elsevier</p> <p><i>International Journal of Mining, Reclamation and Environment</i>, Taylor &amp; Francis</p> <p><i>Journal of Mining Science</i>, Springer</p> <p><i>Mining Journal</i>, Aspermont Media</p> <p><i>Mining Technology: Transactions of the Institutions of Mining and Metallurgy</i>, Taylor &amp; Francis</p>
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