

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF MINERAL RESOURCES ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	MRE912	SEMESTER	9
COURSE TITLE	UNDERGROUND MINE VENTILATION		
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
LECTURES		2	2
LABORATORY EXERCISES		2	2
TOTAL		4	4
<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>	Specialised knowledge		
PREREQUISITE COURSES:	Underground Mining (MRE601)		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uowm.gr/courses/MRE179/		

(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>The course aims to enable students to</p> <ul style="list-style-type: none"> • Know information about the atmosphere of the underground works and the needs of ventilation and cooling • Know the principles of airflow in underground projects • Know how to measure the ventilation parameters of underground works • Choose suitable ventilation and cooling equipment for an underground project • Map and simulate networks for the ventilation of underground works • Configure systems of atmospheric control of underground works

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

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

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Others...

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- 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

(3) SYLLABUS

Basic principles of ventilation, the atmosphere of underground works, principles of air flow, air flow in underground mines, air flow measurements, mining ventilation networks, fans, boosters, natural ventilation, mining and technical ventilation systems, stope ventilation, computer simulation, economic data, gas emissions in underground projects, dust, methane, exhaust gases of internal combustion engines, heat and humidity, cooling, controlled recirculation, atmospheric control instruments and systems, laboratory exercises.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY</p> <p style="text-align: center;"><i>Face-to-face, Distance learning, etc.</i></p>	<p>Face to face, laboratory exercises on the PC using special software</p>													
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p> <p style="text-align: center;"><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 style="text-align: center;">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>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>	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="text-align: left;"><i>Activity</i></th> <th style="text-align: left;"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>28</td> </tr> <tr> <td>Lab exercises</td> <td>28</td> </tr> <tr> <td>Home study</td> <td>34</td> </tr> <tr> <td>Project write-up</td> <td>30</td> </tr> <tr> <td>Course total</td> <td>120</td> </tr> </tbody> </table>		<i>Activity</i>	<i>Semester workload</i>	Lectures	28	Lab exercises	28	Home study	34	Project write-up	30	Course total	120
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<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p><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>Weekly examination of interactive laboratory exercises on the computer (20% of the total grade of the course), final written examination of the theory (50% of the total grade of the course) and evaluation of the semester's work (30% of the total grade of the course). 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><i>Bise, C.J., 2003, Mining Engineering Analysis, Second Edition, Society for Mining, Metallurgy, and Exploration, 313 pages</i></p> <p><i>Darling, P. (Ed), 2011, SME Mining Engineering Handbook, Society for Mining, Metallurgy and Exploration, 1846 pages</i></p> <p><i>Hartman, H.L., 1987, Introductory Mining Engineering, John Wiley & Sons, 633 pages</i></p> <p><i>Hartman, H.L., 1961, Mine Ventilation and Air Conditioning, Wiley, 549 pages</i></p> <p><i>Hustrulid, W.A., Bullock, R.L. (Eds), 2001, Underground Mining Methods: Engineering Fundamentals and International Case Studies, Society for Mining, Metallurgy, and Exploration, 728 pages</i></p> <p><i>McPherson, M.J., 1993, Subsurface Ventilation and Environmental Engineering, Springer, 913 pages</i></p> <p><i>Sierra Fernandez, C., 2020, Mine Ventilation – A Concise Guide for Students, Springer, 372 pages</i></p> <p><i>Thakur, P., 2018, Advanced Mine Ventilation – Respirable Coal Dust, Combustible Gas and Mine Fire Control, ScienceDirect, 530 pages</i></p> <p><i>Tien, J.C., 1999, Practical Mine Ventilation Engineering, Intertec Publishing, 460 pages</i></p> <p>- Related academic journals:</p> <p><i>Minerals, MDPI</i></p> <p><i>International Journal of Mining Science and Technology, Elsevier</i></p> <p><i>International Journal of Mining, Reclamation and Environment, Taylor & Francis</i></p> <p><i>Journal of Mining Science, Springer</i></p> <p><i>Mining Journal, Aspermont Media</i></p> <p><i>Mining Technology: Transactions of the Institutions of Mining and Metallurgy, Taylor & Francis</i></p>
