

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF MINERAL RESOURCES ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	MRE991	SEMESTER	9
COURSE TITLE	MANAGEMENT INFORMATION SYSTEMS IN MINING WORKS		
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:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uowm.gr/courses/MRE193/		

(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"> • Configure and use information systems for the management of mining projects • Depict the individual mining works as activities of an information system • Collect and utilize real-time information from the construction sites of mining projects • Know about mining work assignment systems • Know about wireless and wired communication networks at mine sites. • Know about the application of cutting-edge technologies such as the internet of things and digital twins in mining projects.

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?

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

- 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
- Production of new research ideas
- Project planning and management

(3) SYLLABUS

Management information systems, IT system components, the need for a management system, mining projects as a set of activities, the project as a business, equipment, products and materials, regulatory performance indicators, real-time information collection, SCADA, hardware systems, micro-computers and touch screens, GPS receivers, real-time site and equipment control, mining project management information system structure, elementary departments, procedures, locations, events, delays, calendar, staff, qualities.
 Dispatch system.
 Operating optimization algorithms – methods of operational research in mining.
 The internet of things and digital twins in mining.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face lectures, distance seminars, computer laboratory exercises using mining programming software
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of a projection system, special mining planning software, installed in computer units of a special laboratory, organization and planning of the course and communication with students through the asynchronous e-learning platform open eclass.

<p style="text-align: center;">TEACHING METHODS</p> <p>The manner and methods of teaching are described in detail.</p> <p>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.</p> <p>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</p>	Activity	Semester workload
	Lectures	28
	Laboratory exercises	28
	Project write-up	32
	Lectures study	32
	Course total	120
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p>Description of the evaluation procedure</p> <p>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</p> <p>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</p>	<p>Assessment in Greek or English.</p> <p>Weekly examination of laboratory scheduling exercises on the computer (40% of the total grade of the course), final written examination of theory (50% of the total grade of the course) and final written examination of laboratory exercises (10% of the total grade of the course).</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

- Suggested bibliography:

Casey, J., Baptista, G., 2004, *MineSuite Concepts Guide, Advanced Systems Integration*, 97 pages

Dimitrakopoulos, R., (Ed), *Advances in Applied Strategic Mine Planning, The Australasian Institute of Mining and Metallurgy, Springer, 2018.*

Goel, A., (2008), *Fleet Telematics – Real-Time Management and Planning of Commercial Vehicle Operations, Springer Science (New York)*, 184 pages

Herrmann, J.W., (Ed), (2006), *Handbook of Production Scheduling, Springer Science (New York)*, 318 pages

Καπαγερίδης, Ι., (2017), *Εισαγωγή στη Μεταλλευτική Πληροφορική με Χρήση του Maptek Vulcan, Εκδόσεις σοφία, 503 pages*

Καπαγερίδης, Ι., (2020), *Πληροφοριακά Συστήματα Διαχείρισης Μεταλλευτικών Έργων – Σημειώσεις Θεωρίας και Εργαστηρίου, Πανεπιστήμιο Δυτικής Μακεδονίας, 96 pages*

Maptek Pty Ltd., 2008, *MineSuite – Mine Production Monitoring System User Manual, 507 pages*

Pinedo, M.L., 2008, *Scheduling – Theory, Algorithms, and Systems, 3rd Edition, Springer Science (New York)*, 671 pages

Reveliotis, S.A., (2005), *Real-Time Management of Resource Allocation Systems – A Discrete Event Systems Approach, Springer Science (New York)*, 242 pages

Weintraub, A., Romero, C., Bjrndal, T., Epstein, R., (Eds), 2007, *Handbook of Operations Research in Natural Resources, Springer Science (New York)*, 614 pages

Zeimbekis, V., Tarantilis, C., Giaglis, G., Minis, I., (Eds), (2007), *Dynamic Fleet Management – Concepts, Systems, Algorithms & Case Studies, Springer Science (New York)*, 241 pages

- Related academic journals:

Computers and Operations Research, Elsevier

International Journal of Mining Science and Technology, Elsevier

Internet of Things, Elsevier

Internet of Things Journal, IEEE

Journal of Scheduling, Springer

Real-time Systems, Springer