COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF MINERAL RESOURCES ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	MRE891	SEMESTER	8
COURSE TITLE	Mine Surveying and Geoinformatics		
INDEPENDENT TEACHING ACTIVITIES *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*		WEEKLY TEACHING HOURS	CREDITS
	LECTURES	2	3
	LABORATORY EXERCISES, FIELD WORK	2	2
	TOTAL	4	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialised general knowledge		
PREREQUISITE COURSES:	Geodesy (MRE404)		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uowm.gr/courses/MRE174/		

(2) LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon successful completion of the course, the student will have all the necessary knowledge for the use of modern methods and topographical mapping equipment in outdoor and underground mining projects and general large-scale technical projects.
In particular, he/she will know how to:

- Choose the right equipment
- Organize programs for the mapping of surface and underground mines
- Combine measurements and survey data for mine design
- Use special geoinformatics software and hardware systems
- Ensure safety conditions during topographical work on surface and underground sites.

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
- Teamwork
- Project planning and management

(3) SYLLABUS

Equipment and instruments. Large-scale topographical mappings. 3D surface models generation. Mapping of mines and tunnels. Mapping and monitoring of major technical projects (roads, bridges, junctions, dams, etc.). Drillhole surveying. Mapping of stopes and galleries. Positioning and networking systems in surface and underground mines. Modern mapping and scanning systems with LIDAR and drones. Safety of topographical works in surface and underground mines and quarries. Geoinformatics applications in mining projects.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face, field exercises, laboratory exercises
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of a projection system, special GIS software installed on computer units of a special laboratory, organization and scheduling of the course and communication with students through the asynchronous e-learning platform open eclass.
TEACHING METHODS *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*	

Activity	*Semester workload*
Lectures	28
Interactive lab exercises	28
Theory study	24
Lab exercises study	24
Field work	46
Course total	**150**

STUDENT PERFORMANCE EVALUATION *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.*	Weekly examination of interactive laboratory 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). 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.

(5) SUGGESTED BIBLIOGRAPHY

- Suggested bibliography:

Autodesk, Raster Design Getting Started Guide, Autodesk Inc, 2009, pages 122.

Burrough, P.A., and McDonell, R.A. Principles of Geographical Information Systems, Spatial Information Systems and Geostatistics, Oxford University Press, 1998.

Eastman, J.R., IDRISI Andes Guide to GIS and Image Processing, Clark Labs, 2006, pages 328.

ESRI, GIS for Emergency Management, White paper, Environmental Systems Research Institute Inc, 1999.

Gupta, R.P., 2003, Remote Sensing Geology, 2nd Edition, Springer-Verlag (Berlin), 655 pages

Ζήσου, Α., Εισαγωγή στα Συστήματα Γεωγραφικών Πληροφοριών ArcGIS/ArcView – Θεωρία & Εφαρμογές, Εκδόσεις Αθ. Σταμούλης, 2007, pages 269.

Καρτάλης, Κ., Φειδάς, Χ., Αρχές & Εφαρμογές Δορυφορικής Τηλεπισκόπησης, Β.Γκιούρδας Εκδοτική, 2006, pages 672.

Κουτσόπουλος, Κ., Ευελπίδου, Ν., Βασιλόπουλος, Α., Γεωγραφικά Συστήματα Πληροφοριών – Χρήση του MapInfo Professional, Εκδόσεις Παπασωτηρίου, 2006, pages 278.

Li, J., Zlatanova, S., Fabbri, A., Geomatics Solutions for Disaster Management, Lecture Notes in Geoinformation and Cartography, 3rd International Symposium on Geomatics Solutions for Disaster Management, Springer-Verlag, 2007, pages 444.

Lillesand, T.M., and Kiefer, R.W., Remote Sensing and Image Interpretation, Wiley, 1994

Linder, W., 2006, Digital Photogrametry – A Practical Course, 2nd Edition, Springer-Verlag (Berlin), 214 pages

Μερτίκας, Σ.Π., Τηλεπισκόπηση και Ψηφιακή Ανάλυση Εικόνας, Εκδόσεις ΙΩΝ, 1999, pages 499

Staley, W.W., 1939, Introduction to Mine Surveying, Stanford University Press, 303 pages

- Related academic journals:

Applied Computing and Geosciences, Elsevier

Computers & Geosciences, Elsevier

International Journal of Geographical Information Science, Taylor and Francis

International Journal of Remote Sensing, Taylor and Francis

ISPRS Journal of Photogrammetry and Remote Sensing

Journal of Applied Remote Sensing, SPIE

Journal of Photogrammetry, Remote Sensing and Geoinformation Science, Springer

Journal of Spatial Science, Taylor and Francis

Remote Sensing of Environment, Elsevier

Remote Sensing, MDPI

Transactions in GIS, Wiley