

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF MINERAL RESOURCES ENGINEERING		
LEVEL OF STUDIES	PHD		
COURSE CODE	MRE_PHD01	SEMESTER	
COURSE TITLE	RESEARCH METHODOLOGY		
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		3	6
<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:	English		
IS THE COURSE OFFERED TO ERASMUS STUDENTS			
COURSE WEBSITE (URL)	https://eclass.uowm.gr/courses/126/		

(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 is an introduction to scientific research and the writing of a scientific paper at the PhD level of studies. It attempts to help PhD candidates gain relevant knowledge through research, and understand how it is conducted. Specifically, at the end of the course, PhD candidates will be able to define a research topic, methodically conduct a literature review, determine the hypotheses of their research, implement empirical research, develop and present the findings of their research.</p> <p>Upon successful completion of the course PhD candidates will be able to:</p> <ul style="list-style-type: none"> • know how the bibliographic research is done and the main sources used • know how primary and secondary data are collected, what restrictions exist and how research is done on the internet • Define the methodology of his research and draw up the appropriate plan for its implementation

- know how to develop a strategy to solve his research problem
- Check possible measurement errors, the validity and reliability of their research
- Know how to choose the size of his sample (sampling) and the basic statistical methods of analyzing the data of his research
- Know the qualitative methods of research
- Know how scientific research is written and presented

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
- Working independently
- Production of free, creative and inductive thinking

(3) SYLLABUS

- Introduction to science and scientific research
- The philosophy, theory and practice of research
- Basic principles of research (research proposal, literature review, research design, choice of methodology)
- Qualitative methods of research
- Quantitative research methods
- Design of questionnaires
- Sampling (design, measurement scales, reliability and validity of the measurement)
- Use of statistical packages in research
- Inductive statistical analysis (point estimation, confidence intervals, hypothesis tests)
- Analysis of variance
- Regression and correlation
- Non-parametric statistics
- Ethics in scientific research

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Face-to-face	
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Use of e-class, e-mail, projector, computer, software	
<p style="text-align: center;">TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <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>	Activity	Semester workload
	Lectures	40
	Study and analysis of bibliography	40
	Project write-up	40
	Course total	120
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION <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>	Preparation of a paper on a selected research topic, which is scored after its presentation.	

(5) SUGGESTED BIBLIOGRAPHY

<p><i>- Suggested bibliography:</i></p> <p>"Research Design: Qualitative, Quantitative, and Mixed Methods Approaches" by John W. Creswell and J. David Creswell</p> <p>"Research Methodology: A Step-by-Step Guide for Beginners" by Ranjit Kumar</p> <p>"Research Design and Methods: A Process Approach" by Kenneth S. Bordens and Bruce B. Abbott</p> <p>"The SAGE Handbook of Qualitative Research" edited by Norman K. Denzin and Yvonna S. Lincoln</p> <p>"The Craft of Research" by Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams</p> <p> </p> <p><i>- Related academic journals:</i></p> <p>Journal of Mixed Methods Research</p> <p>Qualitative Research</p> <p>Journal of Research Practice</p>
