COURSE OUTLINE

1. GENERAL

SCHOOL	ENVIRONMENT AND AGRICULTURAL ENGINEERING		
ACADEMIC UNIT	NATURAL RESOURCES AND AGRICULTURAL ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	430	**SEMESTER**	4th
COURSE TITLE	GEOLOGY - GEOMORPHOLOGY		

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	3	3
Laboratory exercises	2	2
	5	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*	Special background, Specialised general knowledge Skills development
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	

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*

The goal of the course is to provide key info regarding the Geological and Geomorphological processes of the Earth, focusing also on the natural resources.

Students will comprehend the endogenous vs exogenous processes that form the landscape and the geological structures. The geoenvironment defines the way we live and our quality of life. An in-depth knowledge of the earth processes provides a valuable info on the planet's functioning and well-being. It would provide key info on environmental planning and best practices regarding the exploitation of the natural resources and the prevention of natural hazards. The course will emphasize the role of geology regarding a) land reclamation and infrastructure works, regarding both the design and monitoring against natural hazards (earthquakes, floods, landslides), b) the soil properties from insitu soils and allochthonous/transported soils, c) water resources, both the quantity and quality of water. Students will comprehend the role of deformation of rocks and how they define water permeability, erosion rates and rock quality. Students are expected to assess how human activities can degrade the natural environment and estimate their impacts.

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…*
	…….

Respect for the natural environment
Working in an interdisciplinary environment
Decision-making
Project planning and management
Search for, analysis and synthesis of data and information, with the use of the necessary technology

3. SYLLABUS

1. Planet Earth, Natural and manmade environment, Geoenvironment and Structure of the Earth. Crust, Mantle and Core, earth discontinuities and how they have been found, oceanic and continental crust.
2. Endogenous vs Exogenous processes. Landscape analysis, Geomorphology, Hydrological basins, sedimentation, alteration (chemical, mechanical), Erosion, Landslides and creeping phenomena, Causes and prevention measures against sliding phenomena, Soil development and sediments. Karstic processes and structures.
3. Lithosphere, Asthenosphere, Plate Tectonic Theory, Seismicity, birth, development and destruction of Oceans, orogenesis-mountain building, volcanism
4. Structural Geology, Deformation mechanism, Brittle and plastic deformation, Faults (types and kinematics), Joints, Folds.
5. Earthquakes, Active faults, landscape development, earthquake magnitude, earthquake intensity, factors controlling the earthquake damage pattern
6. Rocks in Greece, Igneous, Sedimentary, Metamorphic, tectonic and petrological cycle.
7. Geological Time scale. Absolute and relative chronology, fossils
8. Geological structure and evolution of Greece. Hellenic Orogenic Arc, Volcanism, Geothermal energy and applications.
9. Applied Hydrogeology – Hydrological cycle, Water balance, Hydrogeological characteristics of rocks, groundwater table and water extraction, Hydrochemisty of the groundwater, groundwater pollution.

Laboratory exercises include:

Lab 1: Igneous rocks of Greece (Rock specimens)

Lab 2: Sedimentary rocks of Greece (Rock specimens)

Lab 3: Metamorphic rocks of Greece (Rock specimens)

Lab 4: Topographic maps of different scale

Lab 5: Geological map (Legend, Lithostratigraphic structure, cross-sections)

Lab 6: Delineate the boundaries of Hydrological basins on different scale topographic maps

Lab 7: Stream order, drainage density, stream frequency

Lab 8: Construction of a topographic cross-section

Lab 9: Construction of a simple geological cross-section

Lab 10: River deltas, sedimentation processes and flooding

Lab 11: Water balance

Lab 12: Geology, Hydrochemistry and assessing water quality

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	
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*	
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.*	I. Written theory exams (50%) including: - short-answer questions - open-ended questions II. Written Laboratory exams (50%) - Laboratory exercises and problem solving

Activity	***Semester workload***
Lectures	36
Laboratory exercises	24
Fieldtrip	8
Homework	57
Course total	125

4. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1) Geological applications (2005). Migiros 280p (in Greek).

2) Geology – The study of Earth (2007). Papanikolaou D. and Sideris Ch. I. ISBN: 9789601620497, 296p. Pataki Publications (in Greek).

- Related academic journals:

1) Geology
2) Geomorphology
3) Journal of Structural Geology
4) Tectonophysics
5) Earth and Planetary Science Letters