4.5 CE0450 – Surveying Engineering Applications

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
ACADEMIC UNIT	CIVIL ENGINEERING DEPARTMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**CE0450**	**SEMESTER**	**4**
COURSE TITLE	**Surveying Engineering Applications**		

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**
	5	4
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 Course
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/CIV363/

(2) LEARNING OUTCOMES

Learningoutcomes

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.

ConsultAppendix 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 aim of the course is to give the students fundamental concepts of Applied Geodesy

Upon completion of the course, students will have knowledge and skills about:

1. Processes, measuring and computing, through which the engineer can complete the mapping of small and / or large areas, with or without artificial structures.
2. The general principles of stakeouts and the procedures and methodologies of basic stakeouts in the horizontal plane (axes, angles, circular arcs, threads).

Specifically, students will be able to:

1. Use his/her knowledge from the previous course (Geodesy) and utilizes it in the procedures of measurements and calculations.

2. Understand the procedures of a topographic survey from the identification of the study area to the final production of a topographic drawing as well as the procedures of a stakeout.
3. Get familiar with the methodologies of measurements, solutions and rendering of elements of the field and their representation, as well as the methodologies of taking information from diagrams and transferring them to the field (stakeouts).
4. Analyze the elements of the field to be measured and calculate elements that will lead to its accurate representation.
5. Combine and synthesize the information obtained from the measurements in the field for the evaluation of his/her final product.
6. Collaborate with his/her fellow students in the group work of surveying and stakeout in the laboratory part of the course.
7. Develop to a higher degree the skills in basic concepts / knowledge of the use of geodetic instruments.
8. Connect theory with practice through participation in individual and group exercise.
9. Become familiar with new technologies of measurement and data collection.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the DiplomaSupplement 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…*

Specifically, students will be able to perform:

- Apply knowledge in practice.
- Search, analyze and perform the synthesis of data and information, using the necessary technologies.
- Decision making.
- Autonomous work.
- Teamwork.
- Work in an interdisciplinary environment.
- Project design and management.
- Exercise criticism and self-criticism.
- Promoting free, creative and inductive thinking.

(3) SYLLABUS

The course (theoretical part of 2 hours per week) is organized in 12 lectures. The 13th lecture is a summary of the lesson. The lectures are presented below:

1. Revision of Geodesy course.
2. Simple topographic surveys - Basic calculations.
3. Altitude: Trigonometric altitude.
4. Altitude: Leveling.
5. Traverses: Types of traverses – Measurements.
6. Traverses: Errors - Specifications – Calculations.
7. Urban surveying.
8. Making a Topographic diagram.
9. Legislation (Topographic diagram declarations, seashore-beach, cadastre, forestry).
10. Stakeouts: Calculations, applications.
11. Solution of closed polygonal traverses, independent and dependent on the Hellenic Geodetic Reference System.
12. GPS principles, Introduction to new imaging technologies (drone, laser scanner).
13. Revision.

The Laboratory (Practice Exercises of 3 hours per week) are applications of the theory carried out in the countryside (as measurements) or in the classroom (as calculations).

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>In the classroom and in working groups with the physical presence of students (Face-to-face). In more detail:
1. Theory:
• Delivery of the course in the classroom using .ppt presentations and by solving applications in the table
• Presentation and analysis of semester assignments
2. Laboratory – Rural Exercises:
• Use of topographic instruments and solution of on-site applications</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Use of the course website (Outline, Plan provided, Chart implemented, Details for semester work, Lecture material - Notes and presentations).
• Use of electronic presentation media (slide show in Powerpoint).
• Use of Program material “OPEN ACADEMIC COURSES” (video lectures, presentations, exercises).
• Communication with the students is normally made face to face and by e-mail, in special circumstances such as pandemic.</td></tr>
<tr><td>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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Theory Lectures</td><td>26</td></tr>
<tr><td>Rural Workshop</td><td>39</td></tr>
<tr><td>Study - solving exercises in the classroom or weekly exercises</td><td>25</td></tr>
<tr><td>Solve and write a semester topic</td><td>30</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>120</td></tr>
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<tr><td>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.</td><td>Language of evaluation: Greek

Final written examination: 60%
Laboratory: 40%

* Weekly laboratory exercises or exercises in the classroom
* Semester topic - Individual work
It is mandatory to participate in both types of examination (written examination & laboratory), with a grade of over 5 in each of them.
All information is accessible to students on the course website.</td></tr>
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(5) ATTACHED BIBLIOGRAPHY

Greek Bibliography:

1. Georgopulos, G., (2007), Lessons of Topography, Athens: Tziolas Publications (in Greek).
2. Kofitsas, I., (2009), Lessons of Topography, Athens: ION Publications (in Greek).
3. Lambru, E., Pantagis, G., (2010), Applied Geodesy, Thessaloniki: Ziti Publications (in Greek).
4. Sabaidis, P., Ifantis, I., Dukas, I., (2007), Geodesy I: Geodesy Measurements and Calculations, Thessaloniki: Kiriakidi Publications (in Greek).
5. Pantazis, G., (2020), Geodetic Methods of Movement Control, Thessaloniki: Ziti Publications (in Greek).