7.12 CE0731 – Special Topics in Building Technology

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
ACADEMIC UNIT	CIVIL ENGINEERING DEPARTMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**CE0731**	**SEMESTER**	**7**
COURSE TITLE	**Special Topics in Building Technology**		

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**
	4	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, in English
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/modules/auth/opencourses.php?fc=69

(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 learning outcomes of the course aim to be able to the student for the following (after successful completion):

- To understand the design of the building and the building detail with the help of modern algorithmic design tools.
- To connect the design of the node with modern methods of digital implementation (3d printing, laser cutting).
- Familiarity with the tools and modern approaches to design from the scale of the shell to the building detail.
- Deepening in modern algorithmic tools of a building detail.
- Understanding the geometric properties of the whole, which are constantly related to the properties of the individual elements of the structure.

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* *……* *Others…*
The course aims at the following general skills: • Search, analysis and synthesis of data and information, using the necessary technologies • Promoting free, creative and inductive consideration • Autonomous work • Teamwork	

(3) SYLLABUS

The course includes both theoretical and laboratory part with the following subjects:

Theoretical Part:

- The relationship of the engineer with the modern construction process. Interconnection of design and construction through modern digital technologies. (laser cutting, 3d printing)
- Study of Curved surfaces (applications: shells, membranes), Polyhedral surfaces (applications: spatial networks, geodesic domes), Geometric transformations (applications: constructions with flat or three-dimensional patterns)
- Selection of themes of applied character and their development, with the program Rhinoceros, as well as with formulation of algorithms with the program grasshopper.
- Shell and dome design over space, given the floor plan, using modern design tools.
- Types and design of paving at the level and in the space.
- Study of nodes of metal and wood constructions and design for digital implementation (3d printing, laser cutting).

Laboratory Part:

In the laboratory part of the course the theoretical concepts that have been taught in Theory are applied. It focuses on the study of nodes and wiring and the implementation with modern digital methods (3d printing, laser cutting).

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Presentations through a program of dynamic parametric design, posting of educational material on the respective website, provision of digitized material to students (via website, e-mail, etc.).
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*	**Theory:**

Activity	*Semester workload*
Lectures	26
Laboratory Courseworks	26
Personal Study	33
Teamwork	35
Course total	**120**

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.*	• Written Final Exam (60%) which includes problem solving and other crisis questions. • Teamwork (40%) **Laboratory:** • Oral examination in each exercise (50%) • Written Final Examination in the laboratory (50%) • The total grade is formed by the sum of 60% of the grade of Theory and 40% of the grade of the Laboratory. • The evaluation criteria have been presented to the students before the examination, the individual grade of the subjects is written in them and the final grade is accessible through the online platform of the Institution. In addition, students can see their writing and individual grade on the topics, be given clarifications about them and, finally, point out any mistakes they make. • The language of assessment is Greek unless the students come from the Erasmus program, in which case the examination is in English.

(5) **ATTACHED BIBLIOGRAPHY**

Greek Bibliography:

1. Kourniatis N., (2018), Geometric Representations in Applied Architectural Design, Tziola publications, Thessaloniki (in Greek).
2. Tsinikas N., (2016), Architectural Technology, University Studio Press publications, Athens (in Greek).
3. H. Frey, W. Hellmuth, A. Alievs, (2015), Building Design I, Ion publications (in Greek).
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5. Zachariadis A., (2004), Building Technology, University Studio Press, Athens (in Greek).
6. Meyer-Bohe, (1995), Building Details, M. Giourdas publications, Athens (in Greek).
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Foreign Bibliography:

1. Helmut Pottmann, Andreas Asperl, Michael Jofer, Axel Kilian (2007), Architectural Geometry, U.S.A., Bentley Institute Press
2. Allen, S. (1999). Points + Lines. New York, Princeton Architectural Press.
3. Arnheim, R. (1969). Visual Thinking. Berkley, University of California Press.
4. Eisenman, P. (1999). Diagram Diaries. New York,, UNIVERSE.
5. Gelernter, M. (1988). “Reconciling Lectures and Studios.” Journal of Architectural Education.
6. Lynn, G. (1998). Fold, bodies & blobs. Collected essays.
7. Lynn, G. (1999). Animate Form. New York, Princeton Architectural Press.
8. Rakatansky, M. (1998). “Motivations of Animation.” Any 23: 50-57.
9. Sternberg, R. J., Ed. (1999). Handbook of Creativity. Cambridge, Cambridge University Press.