

1.1.1 Bioclimatic Architectural Design

GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	CIVIL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΔOM034	SEMESTER	9th
COURSE TITLE	Bioclimatic Architectural Design		
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	
	4	5	
<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>	Specialization Course		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://elearning.cm.ihu.gr/		

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>Upon successful completion of the course, each student is expected to be able to:</p> <ul style="list-style-type: none"> • Understand the basic concepts and strategies of energy-efficient design for buildings and describe relevant topics using the corresponding terminology. • Distinguish, comprehend, and apply the principles of bioclimatic architecture and the fundamental design methodologies for passive buildings. • Analyze the characteristics of a conventional building with the aim of its upgrading, evaluate options for integrating passive systems into it, such as: interventions in the building envelope (insulation, openings, roof), transformations of the layout, adoption of sustainable materials, environmental interventions. Propose smaller or larger-scale interventions in a well-documented way, towards upgrading. • Create and compose, from the initial stage to a design level of scales 1:100-1:50, a small-scale building (residence) using the tools, techniques, and methods of energy-efficient design for buildings, while considering the surrounding area of the building as well. <p>Prerequisites for the course include knowledge of design principles (Drawing and Computer Aided Design (CAD)) and minimum prior experience in architectural design (covered by the Department's Curriculum).</p>
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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?

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| 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... |
| | |

The course contributes to the following skills:

- _ 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 interdisciplinary environment
- _ Project planning and management
- _ Respect for the natural environment
- _ Criticism and self-criticism
- _ Production of free, creative and inductive thinking

SYLLABUS

The course introduces students to energy-efficient design for buildings, with an emphasis on the ‘passive building’ and the implementation of soft technology applications within the context of sustainability for contemporary building constructions. The aim is for students to acquire knowledge on the basic theory of bioclimatic architectural design and the upgrading of conventional buildings, thus gradually become capable of designing bioclimatic building structures themselves using all the design methodology provided. Additionally, be able to make corrective interventions (upgrades) to existing buildings towards the same direction (low environmental impact, resource efficiency, sustainability). The course includes theoretical lectures and exercises (practice), short or extensive assignments that promote creative thinking (analysis synthesis) as well as design projects; all fostering active student participation in the course.

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to face.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Powerpoint presentations, e-learning platform for educational material	
TEACHING METHODS <i>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.</i>	Activity	Semester workload
	Lectures	
	Practice/exercises	
	Project(s)	38
	Individual study	40

<p>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</p>	<p>Course total (26 hours workload per ECTS credit)</p>	<p>130</p>
<p>STUDENT PERFORMANCE EVALUATION</p> <p><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>	<p>The final evaluation is composed of marks collected from different parts of the teaching process, as follows:</p> <p>A. Written examination (theory part, end of semester): 50% of the final grade</p> <p>B. Examination by design (design part, end of semester): 20% of the final grade</p> <p>C. Quality of exercises, assignments and design projects developed during the semester participation in the course procedures (i.e. oral participation, meeting deadlines for handing in work): 30% of the final grade.</p> <p>The evaluation criteria are listed in the introductory handout of the course, which is posted on the e-learning platform in the beginning of the semester and is also distributed and presented to the students during the 1st class meeting.</p>	

ATTACHED BIBLIOGRAPHY

- _Andreadaki – Chronaki, Eleni, 2017. Bioclimatic Design: Climate Change – Environment – Sustainability (2nd edition). Thessaloniki: University Studio Press Editions [in Greek].
- _Papadopoulos, Michalis Axarli, Cleo, 2015. Building Physics and Passive Solar Energy Building Systems. Thessaloniki: Kyriakidis Editions [in Greek].
- _Papamanolis, Nikolaos, 2015. Building physics and principles of buildings environmental design. [e-book] Athens: Association of Greek Academic Libraries (Kallipos). Available at: <http://hdl.handle.net/11419/5407> [in Greek].