COURSE MODULE OUTLINE

General information

SCHOOL	School of Applied Arts and Sustainable Design		
PROGRAM COURSE	Interaction Generative Design		
LEVEL OF STUDY	Postgraduate		
COURSE UNIT CODE	**IGD51**	**YEAR OF STUDY**	2nd
COURSE TITLE	Geometric Concepts in Algorithmic Design 1		

INDEPENDENT TEACHING ACTIVITIES *in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHNG HOURS**	**CREDITS**
Weekly teaching hours: 21-22 hours per week X 13 weeks	280	10
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4		

COURSE TYPE Compulsory, Optional, Optional mandatory	Compulsory
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION AND EXAMS:	English
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	**https://www.eap.gr/en/diadrastikos-algorithmikos-sxediasmos/diadrastikos-algorithmikos-sxediasmos-thematikes-enotites/#igd51** Each unit has its own page in the EAP digital education space (http://courses.eap.gr), with controlled access (use of code) for students and teachers.

(2) LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:

APPENDIX A

- *Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.*
- *Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and*

APPENDIX B

- *Guidelines for writing Learning Outcomes*

Students will be able to:

- Understand basic geometric concepts in algorithmic design.
- Understand basic concepts related to the design of curved lines and surfaces in algorithmic design.
- Understand fundamental concepts of topology of space.
- Understand the terms in which an optical illusion is created.
- Know the methods of designing an optical illusion.
- Handle geometrical transformations on the plane and in 3d space, using a parametric tool.
- Draw curves and surfaces by the methods of algorithmic design.
- Design an optical illusion with algorithmic design as a tool.

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

Search for, analysis and synthesis of data and information by the use of appropriate technologies,
Adapting to new situations
Decision-making
Individual/Independent work
Group/Team work
Working in an international environment
Working in an interdisciplinary environment
Introduction of innovative research
Project planning and management
Respect for diversity and multiculturalism
Environmental awareness
Social, professional and ethical responsibility and sensitivity to gender issues
Critical thinking
Development of free, creative and inductive thinking
……
(Other…….citizenship, spiritual freedom, social awareness, altruism etc.) …….

Search for, analysis and synthesis of data and information by the use of appropriate technologies
Decision-making
Individual/Independent work
Working in an interdisciplinary environment
Development of free, creative and inductive thinking
Individual/Independent work

(3) COURSE CONTENT

This thematic unit has a dual objective. On the one hand, it introduces students to basic geometric concepts found in algorithmic design. On a second level, it touches on issues of visual perception and the creation of

optical illusions, using algorithmic design as a tool. The application of the geometric knowledge of this unit takes place in the field of visual illusions, with the aim of broadening students' perception of space and its objects.

- Concepts of Visual Perception in Design – Optical illusions
- Introduction to geometry in algorithmic design 1
- Geometric Transformations on the plane and in 3d space
- Elements of curve theory – Curve design methods
- Elements of surface theory – Surface design methods (sketching with algorithms)
- Topology data of Space (in NURBS and MESH models)– Topological transitions of objects between spaces of different dimensions – Projections of objects of higher dimensions

(4) TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	Distance teaching and distance learning
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in teaching, Laboratory Education, Communication with students*	• Using programs to present complex geometric shapes. • Multimedia material (Videos, Slides, Exercises). • PowerPoint presentations with a wide variety of dynamic interactive files. • Presentations through a parametric design program, for the direct supervision of the change of the shape of the designed object, depending on the decisions to handle the object to be displayed.

COURSE DESIGN

Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc.

The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.

Activity/Method	*Semester workload*
3 OSS (* 4 hours)	12
Self-assessment exercises	34
Module activities	17
Preparation of Assignments (3 assignments * 10 hours)	30
Examination	3
Individual study	184
Total module workload (hours)	280

STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS *Detailed description of the evaluation procedures:* *Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other……etc.* *Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.*	Elaboration of three (3) written assignments during the semester. To participate in the final exam, it is mandatory to submit at least two of the three assignments and the total grade in the assignments must be at least 20 out of 100. Final written exam. These criteria are derived from the EAP Study Regulations (https://www.eap.gr/wp-content/uploads/2022/03/kanonismos-spoudwn-isxys-apo-to-didaktiko-etos-2022-2023. pdf) and are posted, both on the website of the Foundation (https://www.eap.gr/education/odigos-spoudwn-eap/), and on the Digital Education Page (courses) of the unit.

(5) SUGGESTED BIBLIOGRAPHY:

- Suggested bibliography

1. Kourniatis, Nikolaos. *Geometric Principles in Generative Design*. Thessaloniki: Tziolas 2021.

2. Peters, Terri, and Brady Peters. *Inside Smartgeometry: Expanding the Architectural Possibilities of Computational Design*, John Wiley & Sons, Incorporated, 2013.

3. Melendez, Frank. *Drawing from the Model : Fundamentals of Digital Drawing, 3D Modeling, and Visual Programming in Architectural Design*, John Wiley & Sons, Incorporated, 2019.

4. Fish, William. *Perception, Hallucination, and Illusion*, Oxford University Press USA - OSO, 2009.

5. Montague, John. *Basic Perspective Drawing: A Visual Approach*, John Wiley & Sons, Incorporated, 2009.

- Related scientific Journals: