## COURSE MODULE OUTLINE

### 1. GENERAL INFORMATION

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|---|---|---|---|
| **SCHOOL** | SCHOOL OF APPLIED ARTS AND SUSTAINABLE DESIGN | | |
| **PROGRAM COURSE** | LIGHTING DESIGN | | |
| **LEVEL OF STUDY** | POSTGRADUATE | | |
| **COURSE UNIT CODE** | SFP51 | **YEAR OF STUDY** | 1st |
| **COURSE TITLE** | General Principles of Lighting and Physiology of Visual Perception. | | |
| **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* | | **HOURS** | **CREDITS** |
| | Weekly teaching hours: 18-19 hours per week X 30 weeks | 560 | 20 ECTS |
| *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:** | There are no prerequisites for this course. | | |
| **LANGUAGE OF INSTRUCTION AND EXAMS:** | GREEK | | |
| **THE COURSE IS OFFERED TO ERASMUS STUDENTS** | No (due to annual duration of the module) | | |
| **COURSE WEBSITE (URL)** | https://www.eap.gr/en/light-design/topics/#s51<br><br>Each module has its own space in the Learning Management System of EAP (http://study.eap.gr), with controlled access (use of code) for students and teaching staff. | | |

## 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*

Upon completion of the module, the student will:

- be acquainted with the nature of light and the basic principles of radiometry and photometry, what a black body is and its applications, the radiometric and photometric quantities, units, and the primary measuring devices of photometry.
- understand basic concepts regarding the properties of natural and artificial lighting.
- have sufficient knowledge of the ways in which light affects people and will therefore be familiar with the principles of human-centric lighting.
- have the theoretical background and know how to use solar trajectory diagrams to determine the natural lighting/shading of buildings
- have acquired a basic understanding of physiology, in terms of the characteristics and functional principles of human vision. He/she will have an understanding of the mechanisms of reception and processing of visual information through which perception is accomplished.
- be able to explain the meaning of colour in science, technology, and visual perception.
- Be aware of the classification of colours and the methods of colour mixing.
- have understood how colour perception works and how the visual system perceives colour in relation to the physical characteristics of the colour stimuli in given lighting conditions.

Upon successful completion of SFP51, students will have developed the following skills:

- Experience with radiometric and photometric calculations.
- Ability to handle lighting and shading in architectural plans, lighting of surfaces or objects for artistic or other purposes.
- Ability to assess the quality of lighting in terms of visual performance and colour rendering and to manage the critical characteristics of lighting - natural or artificial - that influence or determine visual perception.

**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,
Environmental awareness
Adapting to new situations
Decision-making
Individual/Independent work
Group/Team work
Critical thinking
Development of free, creative and inductive thinking
Introduction of innovative research
Working in an interdisciplinary environment

## 3. COURSE MODULE CONTENT

The main objective of the Course Module (C.M.) is for students to get acquainted with the Basic Principles of Light and the Physiology of Visual Perception. The C.M. SFP 51 consists of six thematic sub-units, (1) Principles of photometry – Photometric quantities and units, (2) Visual perception, (3) Nature of color and color perception – Principles of Colorimetry, (4) Natural light basics, sun lighting and shading of buildings, (5) Principles of human centric lighting, (6) Light and shadow, light and space.

Photometry is a key tool for the study of light and lighting design. Students will thoroughly study the principles, the quantities, the instruments and units of light measurements. Furthermore, they will get familiar with the visual system, physiology and the mechanisms of visual perception, they will study color in its physical, psychophysical and colorimetric dimensions, they will look back on the perceptions of light and shadow over time and they will be introduced in architectural lighting design principles and practice.

In addition, they will be using the tools of photometry to approach fundamental considerations in human centric lighting design, exploring lighting solutions that consider lighting quality with reference to human vision and performance on visual tasks, while simultaneously incorporating new insights about the non visual effects of light.

They will learn to deal with light as a means of composition or expression of meaning or aesthetics or creating an atmosphere addressed to the emotion (in psychology), drawing on knowledge about the function and mechanisms of visual perception and considering how to use measurements to manage the qualities of light in relation to visual perception.

The ultimate goal is for students to be able to handle the various possibilities of light in fields such as architecture, interior design, theater, cinema, analyze the requirements of a lighting

project and calculate visual comfort conditions through the threefold scheme: light, space and human.

**C.M. Subject Matter:**

- Light and physiology of visual perception
- Photometric and colorimetrie principles
- Photometric units, lighting calculations and evaluation
- Color mixing and color rendition of light sources
- Design and geometrical characteristics of daylighting

## 4. TEACHING METHODS--ASSESSMENT

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|---|---|
| **MODES OF DELIVERY**<br>*Face-to-face, in-class lecturing, distance teaching and distance learning etc.* | Distance education with five Group Counseling Meetings (OSS) during the academic year on weekends. |
| **USE OF INFORMATION AND COMMUNICATION TECHNOLOGY**<br>*Use of ICT in teaching, Laboratory Education, Communication with students* | We use:<br>Remote meetings tools (cisco webex),<br>Presentation software (e.g. power point),<br>Specialized software in the subjects under study (Dialux Evo, Relux)<br>Additionally, the students use office automation tools, web browsers and e-reader for digital books. |
| **COURSE DESIGN**<br>*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.*<br><br>*The study hours for each learning activity as well as the hours of* | |

| ***Activity/Method*** | ***Annual workload*** |
|---|---|
| 5 OSS (* 4 hours) | 20 |
| 30 Horizontal tutorial OSS (* 2 hours) | 60 |
| Multiple Choice Exercises (3 x 4 hours) | |
| Preparation of Assignments (4 assignments * 10 hours) | 40 |
| Examination | 3 |

| | |
|---|---|
| *selfdirected study are given following the principles of the ECTS.* | Individual study: 437<br>**Total workload (hours): 560** |
| **STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS**<br>*Detailed description of the evaluation procedures:*<br><br>*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.*<br><br>*Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.* | Students are assigned to submit four (4) written assignments during the academic year. The average grade of the four (4) written assignments, weighted at 30%, is taken into consideration for the calculation of the final grade. The grade of written assignments is activated only with a score equal to or above the pass level (≥5) in the final or resit exams.<br><br>The grade of the final or the resit exams shall be weighted at 70 % for the calculation of the final grade. Students have the right to participate in the final/resit exams if (a) at least 50% of the potentially excellent grade has been obtained when adding the total of the four (4) assignments and (b) at least three (3) of the four (4) written assignments have been submitted.<br><br>All the criteria are posted, both in each written assignment (in the LMS http://study.eap.gr), as well as in the general regulation of HOU at: https://www.eap.gr/wp-content/uploads/2022/03/kanonismos-spoudwn-isxys-apo-to-didaktiko-etos-2022-2023.pdf |

## 5. SUGGESTED BIBLIOGRAPHY:

*- Suggested bibliography*

HOU Publications:

A. General Principles of Lighting, Coulour and Light, HOU Patras,2014, Dr. Harrys Kampetzidis.
B. Physiology of Human Perception and Light, HOU, Patras, 2014, Sofia Sotiropoulou

Supplementary Books
Daylighting, Tregenza, P., Wilson, W., Routledge 2011.
Natural Lighting, Tsagrkasoulis A.2015
Lighting, 6th Edition. Pritchard, D. C. (1999), Reading: Addison Wesley.
Human Factors in Lighting, Boyce, P., 2nd& 3rd editions
IESNA (2000). Lighting Handbook. Mark Stanley Rea(ed.), 9th Edition. New York.
Designing with Light: The Art, Science and Practice of Lighting Design, J. Livingston, Wiley 2014

Additional digital (and multimedia) material is available within the “study” platform