AEEE458 - Lighting Engineering

Course Title	Lighting Engineering				
Course Code	AEEE458				
Course Type	Technical Elective				
Level	BSc (Level 1)				
Year / Semester	4th				
Teacher's Name	Dr. Alexis Polycarpou				
ECTS	6	Lectures / week	3	Laboratories/week	0
Course Purpose	The aim of the course is to familiarize students with various concepts and principles of Lighting Engineering in order to implement their knowledge to perform calculations regarding lighting quality assessment and calculation of indoor and outdoor lighting values.				
Learning Outcomes	By the end of the course, students must be able to: 1. Understand basic units related to lighting engineering and design. 2. Analyse basic principles of lighting energy efficiency and evaluate energy efficiency of existing electrical lighting installations based on EN15193 standard. 3. Evaluate and assess parameters related to indoor and outdoor lighting. 4. Evaluate of lighting quality based on EN1264 standard. 5. Apply theoretical parameters on basic operations of lighting simulation software.				
Prerequisites	None	Corequisites	None		
Course Content	• **The physics of light and vision**: Properties of light, photometric units and calculations, vision and the human eye, performance of the human visual system and recommended practice. • **The geometry of illumination:** graphical representation of light source intensity with polar diagrams, directional control of light. • **Lighting design:** Uniform lighting systems and applications of the Lumen method calculations, aspects of interior lighting design, glare and non-uniform lighting systems. • **Lighting Apparatus**: Lamp type performance, operation and selection, factors in luminaires selection. • **Daylight design:** daylighting and windows, average daylight factor for the sky, internal and external reflections.				

	• **System controls and energy considerations:** Potential advantages of types of lighting controls, building regulations and other energy efficiency considerations.
Teaching Methodology	Students are taught the course through lectures (3 hours per week) in classrooms or lectures theatres, by means of traditional tools or using computer demonstration. Auditory exercises, where examples regarding matter represented at the lectures, are solved and further, questions related to particular open-ended topic issues are compiled by the students and answered, during the lecture or assigned as homework. Topic notes are compiled by students, during the lecture which serve to cover the main issues under consideration. Students are also advised to use the subject's textbook or reference books for further reading and practice in solving related exercises. Tutorial problems are also submitted as homework and these are solved during lectures or privately during lecturer's office hours. Students are prepared for final exam, by revision on the matter taught, problem solving and concept testing and are also trained to be able to deal with time constraints and revision timetable. The final assessment of the students is formative and is assured to comply with the subject's expected learning outcomes and the quality of the course.
Bibliography	**Textbooks:** • Lighting Design Basics, by Mark Karlen, Christina Spangler, James R. Benya,Wiley, ISBN:9781119312277, 2017 **References:** • OSRAM indoor and outdoor lighting • Philips Electronics, Lighting and operation equipment • PPT presentations provided by the lecturer.
Assessment	The Students are assessed via continuous assessment throughout the duration of the Semester, which forms the Coursework grade and the final written exam. The coursework and the final exam grades are weighted 40% and 60%, respectively, and compose the final grade of the course. Mid-term written exams are used for the continuous assessment of the students, Group research project is also used. The assessment weight, date and time of each type of continuous assessment is being set at the beginning of the semester via the course outline. An indicative weighted continuous assessment of the course is shown below: • Mid-Term written exams 70% • Group Research project 30% Students are prepared for final exam, by revision on the matter taught, problem solving and concept testing and are also trained to be able to deal with time constrains and revision timetable. The final assessment of the students is formative and summative and is assured to comply with the subject's expected learning outcomes and the quality of the course.
Language	**English**