

USE - The Secret Life of Light

The Secret Life of Light	
Offered by	Department of Industrial Engineering and Innovation Sciences
Language	English
Primarily interesting for	All students.
Prerequisites	Required courses: - Recommended courses: -
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Content and composition

The lighting domain is changing radically. Three major developments have spurred this revolution: (1) society's growing awareness of the need to conserve energy, (2) recent insights in light's pathways through the brain – the discovery of a 3rd class of photoreceptor - and its impact on physical health, psychology and social behaviour, and (3) the introduction of the LED; a low power, flexible light source, offering potential for miniaturization, embedding, and advanced dynamic control. All these developments have direct implications for users and society at large. We can now offer tailored light conditions to optimize cognitive performance, to change behaviour, to support social interaction, provide safety and balance human needs with environmental impact. We consider work environments, home and leisure, care environments as well as outdoor areas at night.

The Secret Life of Light USE course sequence is designed to raise awareness of the impact of light on human functioning to equip engineers from different backgrounds with the necessary insights in psychological and biological lighting needs and with tools to address such needs, and to face the challenges in multi-stakeholder lighting innovation. This USE sequence is coordinated by the Intelligent Lighting Institute (ILI).

Course code	Course name	Level classification	2023 - 2024	2024-2025*
OHEUA0	Light and experience	1.	Regular education	Re-exam
OHSUA0	Advancing light for human functioning	2.	Regular education	Replacement assignment, last opportunity Alternative course: Light and circadian light (code tbd)
OHAUA0	Secret life of light USE project	3.	Regular education	Alternative project, last opportunity

Course description

OHEUA0, Light and experience3.

The exploratory course Light and Experience aims to familiarize students with basic insights in developments in light sources, lighting controls, and our growing insight in light's psychological, biological, and social effects. Students will get acquainted with both theoretical and practical understanding of users' needs and preferences, lights' effects on health and behaviour, interaction with light and the many stakeholders around innovative light applications. We start with 'base camp': one week of introduction into light as a physical phenomenon, the visual system, and lighting design. Students will then explore three themes around intelligent lighting: 1) Light for



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health and wellbeing; 2) Smart urban lighting; and 3) New interaction styles with light.

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OHSUA0, Advancing light for human functioning

The specialized course Advancing Light for Human Functioning offers more in-depth knowledge in a number of domains, structured in modules. Modules adhere to one of the USE perspectives and give students a more thorough understanding of the user, societal issues, or entrepreneurship in the domain of light & lighting. All modules run twice. Students select two modules from the set: The basis of light perception and experience, The appraisal of light – measuring & understanding consumers' reactions, Sensory design, Interaction design for intelligent light, and Business aspects of intelligent lighting solutions. During the final two weeks, students write a research proposal integrating the insights gained from the chosen modules.

OHAUA0, Secret life of light USE project

In the final phase of the Secret Life of Light USE sequence, students select a project team (± 5 students) and assignment during an exciting matchmaking event. Every team will work for an ILI partner (client) and will have (at least) one ILI coach. For each thematic programme, clients and ILI staff together define a small number of challenges, which clearly refer to the USE components. This renders a set of 6-9 challenges/projects to choose from. Examples of such projects: 'Light for safety at the Stratum Eindhoven', 'Light Apps for the Elderly', 'Light for stress relief', 'Simulating daylight', 'Campus 2020'.

Assignments may have a research or design orientation. Research assignments consist of an investigation and a formulation of a vision. Design assignments consist of a design exploration, prototype design, and evaluation. Whether research or design oriented, the assignments should be grounded in a basic understanding of the user, contextual, and technical requirements of innovative light applications, and involve empirical data gathering and analysis, i.e. user-research.