

The Liberation of Light | Technical Trajectory

Offered by:	Department of Industrial Engineering & Innovation Science Department of Applied Physics Department of the Built Environment'
Language:	English
Primarily interesting for:	All students
Contact person:	dr. ir. Yvonne de Kort (Y.A.W.d.Kort@tue.nl)

The Technical Lighting Trajectory “The liberation of light” is a ‘coherent package’ of courses, available as a separate package, or embedded in the certificate program of the Intelligent Lighting Institute (ILI).

Key themes: multidisciplinary, user-centred, sustainable, integrative, innovative.

Innovations in lighting are timely, urgent and require a multidisciplinary perspective. There is a clear and urgent need for engineers with this expertise, given the revolutionary rate of innovations in lighting technology and control, the growing awareness of our need for sustainable solutions, and the increasing insights in the crucial role of light for human health and wellbeing. In this technical trajectory, these new developments will be considered within important new application domains, as reflected in the program lines of the Intelligent Lighting Institute. Currently these lines are:

- No switches allowed, interaction with and control of complex, interactive, and dynamic lighting systems
- Sound Lighting, intelligent indoor lighting applications harnessing (day)light for optimal human functioning and health,
- Brilliant Streets, innovative outdoor applications geared towards energy reduction while preserving perceived safety,
- Open Light, design for opportunity, devoted to exploring limitless possibilities of innovations in lighting, architecture, and control systems.

The Technical Lighting Trajectory “The liberation of light” is designed to train engineers from different backgrounds, uniquely equipped to face the challenges in lighting innovation.

TECH 1 Light and Experience | Exploration (Quartile 1)

(This course is also part of the USE trajectory ‘The secret life of light’)

The exploratory course Light and Experience aims to familiarise students with basic insights in light and lighting design, new developments and insights in lighting applications, lighting technology, and of course it’s impact on humans pertaining to interaction with light, experience of light, and behavioural and health effects. Students will get acquainted with both theoretical and practical understanding of user needs and preferences, light’s effects on health and behaviour, interaction with light and the many stakeholders around innovative light applications.

TECH 2 Physics of Light and Lighting Design | Specialization (Quartile 3)

The advanced course of the Liberation of Light trajectory provides an in-depth technical knowledge in the lighting domain. This knowledge is vital for making a good lighting design and includes technical and physical knowledge on the creation of light as well as its interaction with the physical environment.

After an introduction in the physics of light, optics, photometry and colorimetry, several lamp types are introduced and discussed: classical light sources like incandescent and halogen lamps, but also plasma lamps, LED and OLED. The chemical processes - for example the role of phosphors - are addressed. In addition to knowledge on light sources, the course introduces luminaires and intelligent lighting control. Last, students are introduced to a calculation program.

TECH 3 The liberation of Light project | Application (Quartile 1)

In the third phase of the Liberation of Light technical trajectory, 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. The client and ILI staff define a selection of challenge, each embedded in one of the program lines.

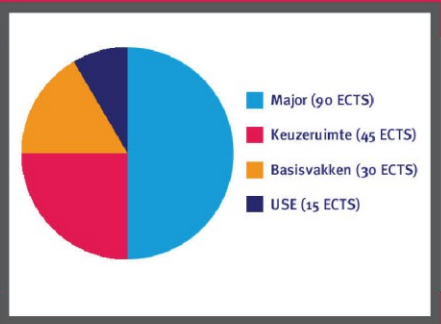
Students choose one of the challenges and work in groups. All assignments consist of a thorough exploration, prototype design, and prototype testing. In each assignment there should also be a clear and explicit consideration of the user perspective. The technical character of projects may vary and have an emphasis in for instance architectural lighting design, innovative controls & interaction, dynamic lighting applications, or energy efficiency/smart materials. Examples of projects: 'Lighting design for independently living elderly', 'Daylight harvesting system for public parking lots', 'Being controlled or controlling our environment', 'Capturing and Liberating Daylight'.

USE trajectory and certificate program

The Intelligent Lighting Institute has also developed an USE trajectory and a certificate program, which are open to students from ALL majors taught at TU/e. More information can be found at the [website of ILI](#).

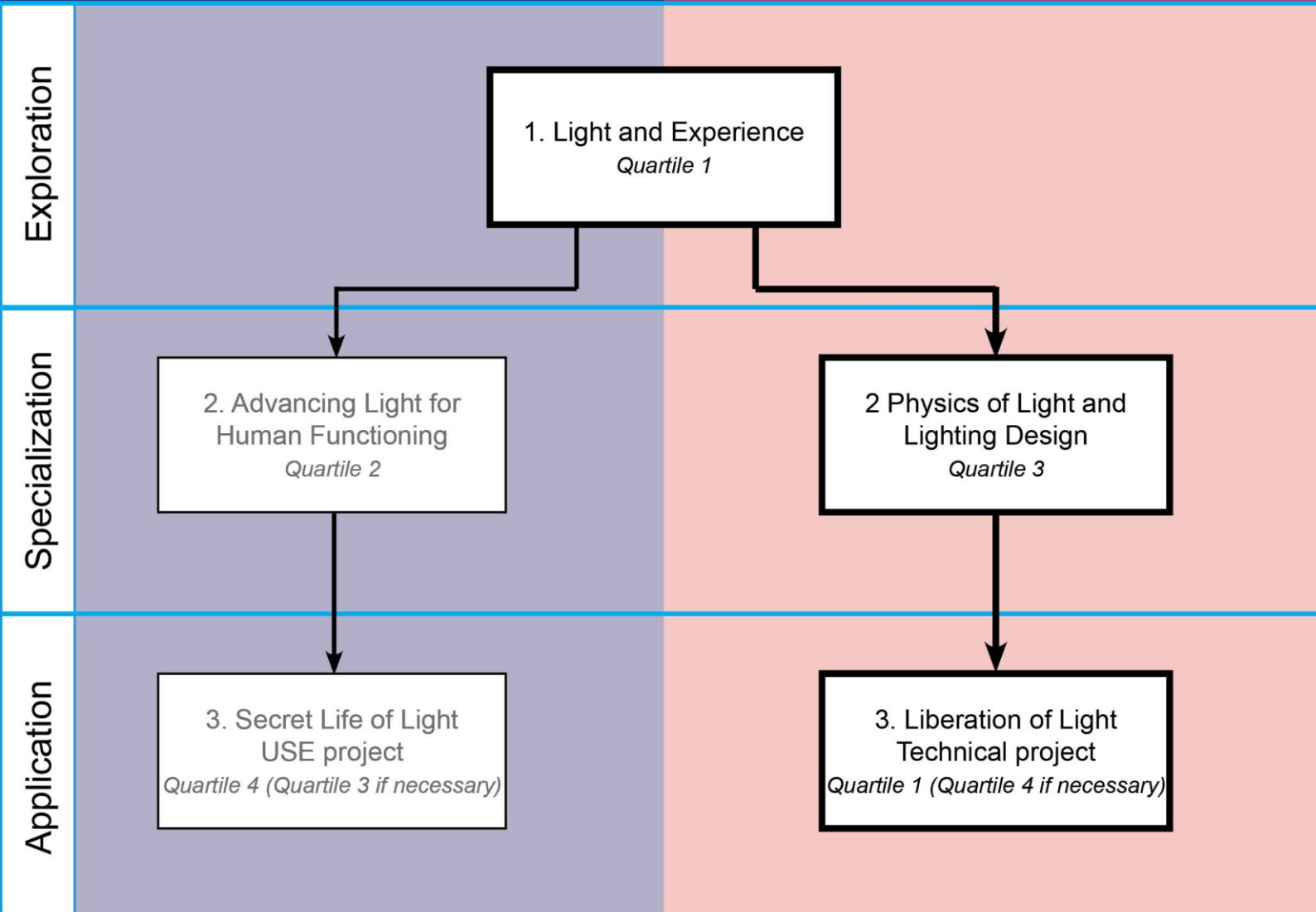
The certificate program Engineering Intelligent Lighting is a multidisciplinary training program for bachelor students majoring in any of the disciplines offered in the TU/e bachelor school. It involves a course program of 30 ETCS, multidisciplinary and tailored to the students' interests and expertise, and a bachelor end project embedded in the Intelligent Lighting Institute. The Intelligent Lighting certificate thus strives for a multidisciplinary, yet thematically focused training of young engineers. The certificate reflects that the student has attained:

- Knowledge of light as a physical phenomenon, light sources, and its behaviour in physical spaces.
- Knowledge of the perception and human factors of light, and awareness of the multifaceted nature of light's effects on human functioning
- Basic knowledge of distributed control, operating systems, computer networks, sensors & signal processing,
- Awareness of the challenges for lighting design and control in terms of system transparency and user interaction



USE trajectory
"The Secret Life of Light"

Technical trajectory
"The Liberation of Light"



↓
Certificate Program
↓
"Engineering Intelligent Lighting"

USE
Trajectory
15 ECTS

&

Technical
Trajectory
10 ECTS

&

5 ETCS
Core electives