



## COURSE SYLLABUS

# Daylighting, 9 credits

*Dagsljusprojektering, 9 högskolepoäng*

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<b>Course Code:</b> TDPN13	<b>Education Cycle:</b> First-cycle level
<b>Confirmed by:</b> Dean Mar 1, 2023	<b>Disciplinary domain:</b> Technology
<b>Valid From:</b> Aug 1, 2023	<b>Subject group:</b> TE9
<b>Version:</b> 1	<b>Specialised in:</b> G2F
	<b>Main field of study:</b> Product Development

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### Intended Learning Outcomes (ILO)

After completing the course, the student shall:

Knowledge and understanding

- Display knowledge of visual qualities related to daylight
- Display knowledge of physical properties of daylight
- Display knowledge of user aspects connected to daylight
- Demonstrate comprehension of various factors that affect the use of daylight in buildings and urban environments
- Demonstrate comprehension of specific challenges associated with daylight lighting in different types of buildings
- Demonstrate comprehension of how daylight and electric lights can interact through lighting controls systems
- Display knowledge of lighting and daylight historically
- Display knowledge of digital and manual methods to simulate daylight in buildings / spaces
- Display basic knowledge of different window types and how the design of windows affects visual comfort

Skills and abilities

- Demonstrate the ability to evaluate daylight conditions in a built environment
- Demonstrate the ability to perform daylight calculations and daylight measurements
- Demonstrate the ability to perform simple calculations of energy use for a daylight solution
- Demonstrate the ability to identify problems related to daylight in a built environment

Judgement and approach

- Demonstrate the ability to choose and use an appropriate work process to evaluate the conditions for daylighting in buildings
- Demonstrate the ability to suggest a daylight solution for a given space
- Demonstrate the ability to evaluate sustainability aspects in a daylighting project

### Contents

The course gives a basic understanding of the importance of daylight in buildings and environments, and how to plan, design, calculate and present daylight solutions in combination with artificial lighting based on the needs of the user, the space / environment conditions and different requirements for architectural, energy efficient, sustainable and user-friendly solutions.

This course includes the following elements:

- Daylight properties, qualities and quantities
- Visual comfort
- Evaluation of daylight conditions based on the colors and materials of the room surfaces and window design
- Methods for calculating and measuring daylight
- Simulation of daylight conditions and visual comfort
- Daylight control and solar shading
- Systems for daylight redirection
- Impact of window design and window glazing type on perception and energy use
- Daylight and architectural design
- Evaluation of daylight conditions in physical models
- Sustainability and energy use related to daylight
- Daylighting

### **Type of instruction**

Lectures, exercises, seminars and workshops

The teaching is conducted in English.

### **Prerequisites**

General entry requirements and taken courses 60 credits in first cycle within the program, including Basics in Light Source and Luminaire Proficiency, 6 credits or Basics in Light Source and Luminaire Proficiency, 9 credits, as well as project experience (or the equivalent).

### **Examination and grades**

The course is graded 5,4,3 or Fail.

The final grade for the course is based upon a balanced set of assessments. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

Name of the Test	Value	Grading
Examination	3 credits	5/4/3/U
Project	4 credits	5/4/3/U
Assignment	2 credits	U/G

### **Course literature**

The literature is preliminary until one month before the course starts.

Boubekri, M. (2008). Daylighting, Architecture and Health – Building Design Strategies. Great

Britain: Architectural Press, 2008. ISBN:978-0-7506-6724-1.

Dubois, M.C., Gentile, N, Laike, T., Bournas, I. & Alenius, M. (2019). Daylighting and Lighting Under a Nordic Sky. Lund: Studentlitteratur AB, 2019. ISBN 978-91-44-12577-0.

**Links, compendiums and supplements in connection with the lectures**

Please note that lectures, seminars and laboratory sessions also serve as basis for the exam.

**Further reading**

Boyce, P. (2014). Human factors in lighting. Boca Raton: CRC Press, 2014. ISBN:978-1-4398-7488-2.

Lam, W. (1986). Sunlighting as formgiver for architecture. NewYork: Van Nostrand Reinhold, 1986. ISBN 0-442-25941-7.