

Course Manual LB

Lighting Technology

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– General information

Long name Lighting Technology

Approving CModule LB_BaET, LB_BaOPT

Responsible Prof. Dr. Holger Weigand
Professor Fakultät IME

Valid from summer semester 2022

Level Bachelor

Semester in the year summer semester

Duration Semester

Hours in self-study 78

ECTS 5

Professors Prof. Dr. Holger Weigand
Professor Fakultät IME

Requirements Geometric Optics
Foundations in
Mathematics and
Physics

Language German

Separate final exam Yes

Literature

R. Baer, M. Barfuss, D. Seifert: Beleuchtungstechnik: Grundlagen, 4. Auflage, Huss-Medien, 2016

H.-J. Hentschel: Licht und Beleuchtung, 5. Auflage, Hüthig Jehle Rehm, 2001

H. R. Ris: Beleuchtungstechnik für Praktiker, 6. Auflage, VDE Verlag, 2019

B. Schröder, H. Treiber: Technische Optik, 11. Auflage, Vogel Communications Group, 2014

Final exam

Details

The proof of achievement is based on a software project that deals with the conception and design of general lighting (evaluation with 60% share of the module grade). Furthermore, a qualified report on measurement and qualification of light sources, as well as a paper on selected topics of light metrology is required (evaluation with 40% share of the module grade).

Minimum standard

For the successful realization of the software project, basic knowledge of the used design software is required. Furthermore, the modelling of real configurations of a general lighting in the context of the software used must be understood. The report requires a correct recording of the primary measurement data as well as a traceable calculation of the secondary measurement data. Likewise, the representation of the measurement results in the form of diagrams must reproduce the measured data consistently. In the preparation of the paper, it is necessary that the theoretical foundations for the explained measurements are described correctly. In addition, the relevant content must be reproduced in a meaningful technical text.

Exam Type

EN andere summarische Prüfungsform

– Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Radiometric and geometric basics Photometric, colorimetric and physiological basics Basic concepts of light generation and light measurement Basics of lighting design Importance of simulation software in the context of lighting technology
Skills	Use of lighting design software for: Calculation of photometric quantities from selected sources and receivers Construction of lighting configurations Analysis of lighting configurations Optimization of lighting configurations Implementation of a lighting design in the field of general lighting

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	1
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0

Special requirements

none

Accompanying material	Lecture slides (as PDF) Exercise examples (lighting design files) Lighting design software Software for numerical and graphic evaluations Software for scripting Software Documentation
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Separate exam	Yes
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Separate exam

Exam Type	EN andere studienbegleitende Prüfungsform
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Details	The proof of achievement is based on a software project that deals with the conception and design of a general lighting (evaluation with 60% share of the module grade).
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Minimum standard	For the successful realization of the software project, basic knowledge of the used lighting design software is required. Furthermore, the modelling of real lighting configurations in the context of the software used must be understood.
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– Practical training

Learning goals

Goal type	Description
Skills	Development of an understanding of different photometric quantities and their significance for general lighting based on experiments. Whereby, real light sources are measured in team work.
Skills	Preparation of data sheets for lamps and / or luminaries on the basis of previously performed measurements of the corresponding photometric properties.

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	2
Tutorial (voluntary)	0

Special requirements

none

Accompanying material see accompanying material to lecture / exercise

Separate exam Yes

Separate exam

Exam Type EN andere studienbegleitende Prüfungsform

Details It requires a qualified report on the measurement and qualification of light sources, as well as a paper on selected topics of light measurement (evaluation with 40% share of the module grade).

Minimum standard

The generated data sheets contain correctly determined primary measurement data. The calculation of the secondary measurement data must be traceable. Charts and numeric data must be consistent.

In the preparation of the paper, it is necessary that the theoretical foundations for the explained measurements are described correctly. In addition, the relevant content must be reproduced in a meaningful technical text.