Lighting Technology, 3 ECTS

Level: Advanced studies

Grading scale: 0 – 20

Primary language of instruction: English

Teacher in charge: Youri Meuret

Learning outcomes: At the end of this course, students are able to design, fabricate, and characterize new lighting fixtures, starting from the different technological components: light sources, optics, thermal components, and driving electronics. Using optical (ray-tracing) and thermal (CFD) modelling and design tools, students can simulate and analyze various alternatives and solutions, taking the optical and thermal properties of the subcomponents into account. Students can select proper LED source combinations, and program the required driving algorithms to achieve optimal performance, taking the various trade-offs between the different performance metrics into account. After assembly of the selected/designed subcomponents, the efficiency and spectral properties of the final product is characterized.

Contents: Part 1 : Characterization of light sources and optical component / Part 2 : Optical/thermal modelling and design of lighting fixtures / Part 3 : Programming of driving algorithms / Part 4 : Assembly and characterization of lighting fixtures.

Study methods and assessment criteria

Study methods:

- lectures (on campus) during a summer course

- exercises/lab sessions: students collaborate on a number of exercises or tasks, the reporting of which is to be submitted online before a given deadline (to be defined) - submission required

- company visit(s)

Teaching methods

- (guest) lectures on campus (12h)

- company visit(s) (4 h)

- group assignments (online submission) (12 h)

- presentation of final results (2h)

Lighting Metrology, 4 ECTS

Level: Advanced studies

Grading scale: 0 – 20

Primary language of instruction: English

Teacher in charge: Frédéric Leloup

Learning outcomes: At the end of this course, students will understand the working principles of basic radiometric and photometric measurement instruments (filter-based and spectral based units) and of goniometrical measurement systems (goniometer, BRDF). They will have obtained practical experience in using these instruments, including performing optical power and wavelength calibration using primary and working standards. They will know how to handle measurement uncertainties and how to calculate their propagation.

Contents: Chapter 1 – Detectors; Chapter 2 – Spectral Integrated vs. Resolved measurements; Chapter 3 – Radiometric and photometric Measurements ; Chapter 4 – Near-field goniophotometry and BSDF

Study methods and assessment criteria

Study methods:

- lectures (on campus) during a summer course

- guest lectures

- Lab assessments / group report: students collaborate on a number of lab exercises or tasks, the reporting of which is to be submitted online before a given deadline (to be defined) - submission required

- company visit(s)

- Presentation of the final results at the end of the summer course

Teaching methods

- (visiting) lectures on campus (16 h)

- company visit(s) (4 h)

- Lab assignments (online submission) (12 h)