

IDENTIFICATION

Course code : ESI-SPI-CI-BE4-S8-UE2-EC5
ECTS : 2.5

DURATION

Lectures :	12
Tutorial classes :	12
Labs :	16
Total :	40

Project :
Personnal work :

ASSESSMENT

2 continuous assessment grades and 4 practical works

TEACHING MATERIALS

Digital resources : course booklets, presentations, standards, regulations, and software

LANGUAGE

English

CONTACT

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UE : UE8-QEB

COURSE : Lighting and Acoustics

SCOPE OF THE COURSE

OBJECTIVES

Design of artificial lighting and evaluation of natural lighting quality
Assessment of acoustic nuisances and design of solutions for buildings

COMPETENCE AND SKILLS

Advanced knowledge for manual calculation of illuminance on the work plane for artificial lighting and numerical simulation of visual comfort in natural lighting.
Basic knowledge for using an integrating sound level meter and implementing regulatory calculations in building acoustics within a humid tropical context (use of natural cross-ventilation in rooms).

PROGRAM

Theoretical part (lectures and tutorials in English) : - Basics of lighting and daylighting : Physical quantities, units, measures, color temperature and rendering. - Artificial lighting : Technologies, luminous efficacy and photometric curves. - Daylighting : Outside illuminance, sky luminance and models, daylight factor and Useful Daylight Illuminance (UDI). - Daylighting software : Daysim. - Generalities and theory of acoustic waves. - Free-field propagation. - Acoustic correction. - Acoustic insulation. - Acoustic regulations in the French overseas departments.

Practical part (4 lab sessions) : - Lab session 1 : Recording of photometric curves and determination of luminaire luminous efficacy, application to the design of artificial lighting for a room. - Lab session 2 : Mapping of Daylight Factor, UDI, and Daylight Autonomy for a real case. - Lab session 3 : Acoustic attenuation of single and double walls, laboratory testing. - Lab session 4 : Acoustic insulation against airborne and impact noise in real situations, regulatory calculations and measurements.

BIBLIOGRAPHY

Gary Gordon, *Interior Lighting for Designers*, 4th ed. (New Jersey : John Wiley & Sons, Inc., 2003), 124.
Susan M. Winchip, *Designing a Quality Lighting Environment* (New York : Fairchild Publications, Inc., 2005), 158.
Reinhart C F, *Daylight Availability and Manual Lighting Control in Office Buildings*, Fraunhofer IRB Verlag, Stuttgart, Germany, 2001.
Jacques Jouhaneau, *Acoustique des salles et sonorisation* [Room Acoustics and Sound Reinforcement], Technique et Doc (ISBN : 978-2743004637).

REQUIREMENTS

Building processes, energy transfer by radiation, signal processing