UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Visual Ergonomics

2425-1-F1702Q003

Aims

To develop a student's theoretical understanding of visual ergonomics and the impact of the working environment on the visual system and working performance. Provide elements on how to assess the characteristics of working stations and how to measure the responses of the visual system. To allow students to provide optical appliances and other optometric interventions to deal with the visual loads and visual fatigue in the working environment.

Learning Objectives
By the end of the module, a successful student will gain:
-LO1: theoretical knowledge about Visual Ergonomics, Radiometry, Photometry, and Digital screen technology and the ability to perform photometric measurements.
-LO2: practical skills to perform digital simulation of lighting in working environments

- LO3: practical skills to perform radiometry/photometry measurements in working environments
  -LO4: theoretical knowledge about the impact of the working environment characteristics on the visual, the musculoskeletal and the postural systems, and the ability to perform measurements of these responses.
  -L05: theoretical knowledge and decision making on optometric interventions for visual ergonomics issues.

Contents

The module will cover principles of visual ergonomics: characterization of working environment, assessment of visual load, optometric management of visual ergonomics issues.

Detailed program

Lectures

1. What is Visual Ergonomics.
2. International/national standard (ISO 9241-303:2011) Ergonomics of human-system interaction.
3. Radiometry vs. Photometry.
4. Photometric units: lighting, sources, illumination, luminance.
5. Digital screen technology: characteristics of the screens and electronic displaying (Cathode ray tube displays, Liquid crystal displays); anisotropic effects of LCD screens.
6. Glare/reflections and polarising optical devices.
7. The variety of environmental and occupational conditions
8. The assessment of visual ergonomics issues: subjective and objective measurements
9. The digital environment load: the case of computer vision syndrome
10. Optometric interventions in Visual ergonomics
11. Short outline of visual ergonomics of 3D artificial environments

Interactive Lectures

1. software for simulations of lighting and renderings of a workspace
2. Measuring photometric characteristics of visual stimuli
3. eye tracker methods for analysing eye movements.

Prerequisites

See curricular prerequisites for the admission Master's Degree Program

Teaching form

Learning objectives will be pursued through different teaching methods:

? Frontal Lectures (3CFU 21h)
? Interactive Lectures remotely delivered (synchronous) (3CFU 21h) (Ansys software for lighting)
? Tutoring
? Student-managed learning

Textbook and teaching resource

Lecturers' handouts

Semester

First semester

Assessment method

Final summative assessment is formed by 2 tasks:
• Written assessment
• Oral assessment

The Written exam is based on 20 Multiple choice questions and one open question which investigates the theoretical knowledge learning that concerns LO1, L04, and LO5.
This assessment is delivered at the end of the module and is worth 60% of the unit mark maximum (18 out of 30).

The oral exam is based on oral open questions that investigate the ability to describe practical procedures concerning with of LO2, and LO3.
This assessment is delivered at the end of the module and is worth 30% of the unit mark maximum (12 out of 30).

The final grade will be represented by the sum of the marks achieved in the two tasks. The minimum mark to pass is 18 out of 30.

Office hours

Appointment needed

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | RESPONSIBLE CONSUMPTION AND PRODUCTION