



LASER SAFETY

Anno immatricolazione	2020/2021
Anno offerta	2021/2022
Normativa	DM270
SSD	FIS/03 (FISICA DELLA MATERIA)
Dipartimento	DIPARTIMENTO DI INGEGNERIA INDUSTRIALE E DELL'INFORMAZIONE
Corso di studio	ELECTRONIC ENGINEERING
Curriculum	PERCORSO COMUNE
Anno di corso	2°
Periodo didattico	Secondo Semestre (07/03/2022 - 17/06/2022)
Crediti	6
Ore	45 ore di attività frontale
Lingua insegnamento	English
Tipo esame	SCRITTO
Docente	MILANI DANTE (titolare) - 6 CFU
Prerequisiti	Understanding of basic principles of electromagnetic theory, geometrical and wave optics.
Obiettivi formativi	<p>The course is designed to teach the necessary knowledge and to understand the rational of laser safety. At the end of the course the students learned to classify a laser product, carry out laser risk assessment and prescribe prevention and protection measures in all work environments.</p> <p>The program, articulated in lectures and practical lessons, meets the training requirements for the TSL outlined by the CEI (Italian Electrotechnical Committee) and for LPA (Laser Protection Adviser) outlined by IEC International Standards.</p>
Programma e contenuti	Basic knowledge: Laser fundamental physics and applications

Italian laws, european directives and international standards about laser safety
 Biological effects of laser radiation
 Exposure Limit Values (ELVs) and Maximum Permissible Exposures (MPEs)
 Accessible Emission Levels (AELs) and classification of laser products
 Laser risk assessment
 Laser radiation collateral hazards
 Selecting control measures
 Laser guards and viewing windows
 Personal protective equipment
 Lasers in the healthcare environment
 Lasers in the industrial environment

Expertise:
 Mathematical approach
 How to measure the laser radiation
 Manufacturer's requirements
 Protective eyewear, laser guard and viewing window choice

Numerical exercises and measures
 Will be proposed numerical examples and measurements:
 Calculation of the Exposure Limit Values (ELVs)
 Calculation of Accessible Emission Levels (AELs)
 Classification of continuous and pulsed lasers
 Nominal Ocular Hazard Distance
 Protective eyewear, laser guard and viewing window choice

Metodi didattici

Lectures (hours/year in lecture theatre): 42
 Practical class and measures (hours/year in lecture theatre): 6

Testi di riferimento

Laser safety laws, standards (IEC-EN-CEI, UNI) in force. Lecture notes

Modalità verifica apprendimento

Written test generally, which includes theory and numerical exercises.
 The sufficient students can be accept the mark gotten in the written test or they can do a oral test.

Altre informazioni

Obiettivi Agenda 2030 per lo sviluppo sostenibile

[Gli obiettivi](#)