Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Industrial Electrical Applications
Course code	42156
Scientific sector	ING-IND/32
Degree	Industrial Mechanical Engineering (L-9)
Semester	I
Year	3
Academic Year	2022-23
Credits	6
Modular	No

Total lecturing hours	36
Total lab hours	-
Total exercise hours	24
Attendance	
Prerequisites	Electrotechnics
Course page	

Specific educational objectives	*The aim of the course is to provide the most significant elements on the applications of electrical engineering concepts.* *Students will learn the basics of electrical systems, machines, converters and plants, also dealing with the related safety issues.* *By means of case-studies, energy efficiency and costs aspects will also be considered, considering both classical and innovative applications.*

Lecturer	Dr. Emanuele Fornasiero emanuele.fornasiero@unibz.it
Scientific sector of the lecturer	ING-IND/32
Teaching language	English
Office hours	By appointment
Teaching assistant (if any)	-
Office hours	-
List of topics covered	The course covers the topics of electrical power generation, distribution, conversion and usage, from a system-level point of view. The main topics are as follows: • Electrical systems, control and safety • Electrical machines (transformer, rotating machines) • Introduction to static converters • Industrial applications (sensors, actuators) Application examples will be addressed (e.g. electrical energy generation, conversion, transportation, storage and usage)

Teaching format	Online lectures, exercises, practical pc activities.

Learning outcomes (ILOs)	**Knowledge and understanding:** Master the most important concepts about industrial electrical applications, understand the design principles of electrical equipment and installations. **Applying Knowledge and understanding:** Using proper criteria and tools for designing or choosing electrical systems and devices. The elements learnt are applied to real-world case-studies. **Making judgments:** Ability to select the more adequate electrical system for a certain industrial application. **Communication skills:** Acquisition of the field-related technical terminology. Ability to describe the state-of-the-art of the technology adopted in electrical industrial systems. **Learning skills:** Ability to learn autonomously is improved by acquiring analytical approaches, inter-disciplinary skills and by reading and understanding scientific and technical documentation.

Assessment	The assessment of the course is by written exam. Written exam comprises numerical exercises and generic theory questions.
Assessment language	English
Evaluation criteria and criteria for awarding marks	Final mark. Relevant for assessment: clarity of written answers, proper explanation of the assumptions.

Required readings	There is no single textbook covering the entire course content. The material is collected from various sources, which will be announced during the course.
Supplementary readings	1. Chitarin, G.; Gnesotto, F.; Guarnieri, M.; Maschi, A. & Stella, A. Elettrotecnica 2: Applicazioni, Editrice Esculapio 2. Fauri, Gnesotto, Marchesi, Maschio, "Lezioni di Elettrotecnica – Applicazioni elettriche", Editrice Esculapio 3. Giorgio Rizzoni, „Elettrotecnica: principi ed applicazioni", edizione italiana a cura di Paolo Gubian, Francesco Vacca, Silvano Vergura, McGraw-Hill 4. Hughes, A. Electric motor and drives, Elsevier