

## Syllabus

### Course description

<b>Course title</b>	Industrial Electrical Applications
<b>Course code</b>	42156
<b>Scientific sector</b>	ING-IND/32
<b>Degree</b>	Industrial Mechanical Engineering (L-9)
<b>Semester</b>	I
<b>Year</b>	3
<b>Academic Year</b>	2021-22
<b>Credits</b>	6
<b>Modular</b>	No

<b>Total lecturing hours</b>	36
<b>Total lab hours</b>	-
<b>Total exercise hours</b>	24
<b>Attendance</b>	
<b>Prerequisites</b>	Electrotechnics
<b>Course page</b>	

<b>Specific educational objectives</b>	<p><i>The aim of the course is to provide the most significant elements on the applications of electrical engineering concepts.</i></p> <p><i>Students will learn the basics of electrical systems, machines, converters and plants, also dealing with the related safety issues.</i></p> <p><i>By means of case-studies, energy efficiency and costs aspects will also be considered, considering both classical and innovative applications.</i></p>
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<b>Lecturer</b>	Dr. Emanuele Fornasiero emanuele.fornasiero@unibz.it
<b>Scientific sector of the lecturer</b>	ING-IND/32
<b>Teaching language</b>	English
<b>Office hours</b>	By appointment
<b>Teaching assistant (if any )</b>	-
<b>Office hours</b>	-
<b>List of topics covered</b>	<p>The course covers the topics of electrical power generation, distribution, conversion and usage, from a system-level point of view.</p> <p>The main topics are as follows:</p> <ul style="list-style-type: none"> <li>• Electrical measurements</li> <li>• Electrical machines (transformer, rotating machines)</li> <li>• Introduction to static converters</li> <li>• Electrical systems, control and safety</li> </ul> <p>Application examples (e.g. electrical energy generation, conversion, transportation, storage and usage)</p>

<b>Teaching format</b>	Online lectures, exercises, practical pc activities.
<b>Learning outcomes (ILOs)</b>	<p><b>Knowledge and understanding:</b> Master the most important concepts about industrial electrical applications, understand the design principles of electrical equipment and installations.</p> <p><b>Applying Knowledge and understanding:</b> Using proper criteria and tools for designing or choosing electrical systems and devices. The elements learnt are applied to real-world case-studies.</p> <p><b>Making judgments:</b> Ability to select the more adequate electrical system for a certain industrial application.</p> <p><b>Communication skills:</b> Acquisition of the field-related technical terminology. Ability to describe the state-of-the-art of the technology adopted in electrical industrial systems.</p> <p><b>Learning skills:</b> Ability to learn autonomously is improved by acquiring analytical approaches, inter-disciplinary skills and by reading and understanding scientific and technical documentation.</p>
<b>Assessment</b>	The assessment of the course is by written exam. Written exam comprises numerical exercises and generic theory questions.
<b>Assessment language</b>	English
<b>Evaluation criteria and criteria for awarding marks</b>	Final mark. Relevant for assessment: clarity of written answers,
<b>Required readings</b>	There is no single textbook covering the entire course content. The material is collected from various sources, which will be announced during the course.
<b>Supplementary readings</b>	<ol style="list-style-type: none"> <li>1. Chitarin, G.; Gnesotto, F.; Guarnieri, M.; Maschi, A. &amp; Stella, A. Elettrotecnica 2: Applicazioni, Editrice Esculapio</li> <li>2. Fauri, Gnesotto, Marchesi, Maschio, "Lezioni di Elettrotecnica – Applicazioni elettriche", Editrice Esculapio</li> <li>3. Giorgio Rizzoni, „Elettrotecnica: principi ed applicazioni“, edizione italiana a cura di Paolo Gubian, Francesco Vacca, Silvano Vergura, McGraw-Hill</li> <li>4. Hughes, A. Electric motor and drives, Elsevier</li> </ol>