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: 2021-22
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 measurements
- Electrical machines (transformer, rotating machines)
- Introduction to static converters
- Electrical systems, control and safety
Application examples (e.g. electrical energy generation, conversion, transportation, storage and usage)
### Teaching format
Online lectures, exercises, practical pc activities.

### Learning outcomes (ILOs)

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

### 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
2. Fauri, Gnesotto, Marchesi, Maschio, “Lezioni di Elettrotecnica – Applicazioni elettriche”, Editrice Esculapio
4. Hughes, A. Electric motor and drives, Elsevier