

Giulio Antonini

Programme of “Elettrotecnica” “Electrical Engineering”	
<ul style="list-style-type: none"> • Code: I1G034, I0536 • type of course unit: compulsory • level of course unit: first cycle in Industrial Engineering (Mechanical Engineering track and Management Engineering track) • year of study: 3rd for I1G034, 2nd for I0536; semester: 2nd 	
<p>Number of ECTS credits: 6 (workload is 150 hours; 1 credit = 25 hours)</p>	
<p>Teacher: Giulio Antonini</p>	
1	<p>Course objectives</p> <p>The goal of this course is to provide the student a basic knowledge of circuit theory, electrical machines and electrical systems.</p> <p>On successful completion of this module, the student should be able to analyze electrical single phase and three phases circuits, should understand the functioning of the most important electrical machines and should be aware of the most common protection techniques.</p>
2	<p>Course content and Learning outcomes (Dublin descriptors)</p> <p>Topics of the module include:</p> <p>Analysis of electrical circuits: DC analysis, Ohm's law, Kirchoff principles, node analysis, loop analysis, Thevenin Theorem, AC analysis, phasor method, active, reactive, complex power.</p> <p>Magnetostatic fields and magnetic circuits: Ampere's law, magnetic materials, hysteretic materials; magnetic circuits, Hopkinson's laws, Faraday's law.</p> <p>Transformers: Building principles, single phase transformer: equivalent circuits, three phase transformers.</p> <p>Induction Motors: building principles, three phase motor, single phase motor.</p> <p>DC Motors: building principles, equivalent circuits.</p> <p>Basic electrical systems: transmission lines, switches, grounding systems.</p> <p>On successful completion of this module, the student should:</p> <ul style="list-style-type: none"> - have deep knowledge of the circuit theory in the DC and AC regimes; - have knowledge and understanding the principles of magnetostatic fields and magnetic circuits; - understand and explain the characteristics of the main electrical machines; - understand the fundamental concepts of electrical systems, including transmission lines, switches, grounding systems; - demonstrate skills in analyzing DC and AC circuits, including electrical machines; - demonstrate capacity to read and understand other texts on related topics.
3	<p>Prerequisites and learning activities</p> <p>The student must have notions of physics and mathematics as taught in the courses of Calculus and Physics.</p>
4	<p>Teaching methods and language</p> <p>Teaching method: Lectures and exercises.</p> <p>Language: Italian / English</p> <p>Ref. Text books : M. Guarnieri, A. Stella. Principi ed Applicazioni di Elettrotecnica, Volume I. Edizioni Progetto Padova, 1998; S. Cristina. Appunti di Elettrotecnica, Volume I. Edizioni Progetto Leonardo, Bologna, 1998. Didactic material available by the teacher.</p>
5	<p>Assessment methods and criteria</p> <p>Written and oral examination.</p>