

<p style="text-align: center;"><b>Programme of “Motori e Azionamenti Elettrici”: “Electrical Motors and Drives”</b></p>		
<ul style="list-style-type: none"> <li>• <b>Code:</b> I0241</li> <li>• <b>optional</b></li> <li>• <b>2<sup>nd</sup> cycle in Mechanical Engineering, 1<sup>st</sup> year, 1<sup>st</sup> semester</b></li> </ul>		
<p><b>Number of ECTS credits: 6 (workload is 150 hours; 1 credit = 25hours)</b></p>		
<p><b>Teacher: Francesco Parasiliti Collazzo</b></p>		
<b>1</b>	<b>Course objectives</b>	The goal of this course is to provide the basic principles and applications of the main Electrical Motors and Drives.
<b>2</b>	<b>Course content and Learning outcomes (Dublin descriptors)</b>	<p>Topics of the module include:</p> <ul style="list-style-type: none"> <li>• <b>Introduction to adjustable speed drives.</b></li> <li>• <b>Steady state Electrical Machines models: DC Motors, Induction Motors.</b></li> <li>• <b>DC Motor speed control and multiquadrant operation. Separately excited DC Motors: armature voltage control, armature current control, field control.</b></li> <li>• <b>Induction Motors speed control: variable voltage, constant voltage/frequency control, current control, flux weakening operation.</b></li> <li>• <b>DC Converters: rectifiers and choppers.</b></li> <li>• <b>DC Motor Drives: single and multiquadrant drives.</b></li> <li>• <b>AC Converters: voltage source inverter. Six-step inverter and PWM inverter, modulation techniques, current control,</b></li> <li>• <b>Speed control of AC Motor Drives: voltage/frequency control.</b></li> </ul> <p>On successful completion of this module, the student should</p> <ul style="list-style-type: none"> <li>- have <b>knowledge and understanding</b> of the basic principles and applications of the main Electrical Motors and Drives</li> <li>- <b>understand and explain</b> the physical mechanisms of the main electric motors and drives</li> <li>- <b>understand</b> the basic principles of the electrical motor speed control</li> <li>- <b>demonstrate skill and ability</b> in the choice of electrical motors and drives vs applications</li> <li>- demonstrate <b>capacity</b> for reading and understand other texts on related topics.</li> <li>-</li> </ul>
<b>3</b>	<b>Prerequisites and learning activities</b>	The student must know the contents of the course <b>“Electrotechnics”</b>
<b>4</b>	<b>Teaching methods and language</b>	<p><b>Lectures and practical lab experiences, home work</b></p> <p><b>Language:</b> Italian</p> <p><b>Ref. Text books:</b></p> <p>Lectures Notes;</p> <p>G. K. Dubey, Power Semiconductor Controlled Drives, Prentice-Hall International Editions;</p> <p>J.M.D. Murphy, F.G. Turnbull, Power Electronic Control of AC Motors, Pergamon Press.</p>
<b>5</b>	<b>Assessment methods and criteria</b>	oral exam