

**DEGREE PROFILE OF**  
**Laurea Magistrale in INGEGNERIA ELETTRONICA**  
**Second Cycle Degree in ELECTRONICS ENGINEERING**

TYPE OF DEGREE & LENGTH	Single Degree (120 ECTS-credits), 2 years
INSTITUTION(S)	Università degli Studi dell'Aquila - <i>University of L'Aquila</i> , ITALY
ACCREDITATION ORGANISATION(S)	Italian Ministry of Education and Research Register of Engineers (Albo degli Ingegneri)
PERIOD OF REFERENCE	Programme validated for 3 years starting in October 2013
CYCLE /LEVEL	QF for EHEA: Second Cycle; EQF level: 7; NQF for Italy: Laurea Magistrale

<b>A</b>	<b>PURPOSE</b>
	<p>Graduates of this second cycle course, in accordance with the Italian Ministry Degree n.270/2009, are licensed professionals and high-profile specialists in the field of Electronics Engineering.</p> <p>The main objective of the Master in Electronics Engineering is to train an engineer to be able to design and develop technologies and electronic systems that can be applied in different contexts. The feature that distinguishes the educational goals of this study path is to consider the electronic systems in their complexity and wholeness, asking at the same time focus on design and realization issues of its constituent elements (both hardware and software).</p> <p>The course of study provides the necessary skills to this complex professional, deepening its themes of information and communication technologies.</p> <p>The foundations of mathematics, physics, computer science and electronics acquired in the bachelor's degree, are deepened, developing the potential applications and directing the training towards the design and management of electronic systems.</p> <p>The whole educational track dedicates ample space to the application and laboratory activities, conducted individually or in groups. The aims are to develop the ability to engage in professional activities, and also to stimulate creativity to the choice of original solutions.</p> <p>The programme meets the requirements of European and National laws and Directives. Degree holders, after a national exam, can be enrolled in the Italian Register of the Engineers (Albo degli Ingegneri), established with <i>D.P.R. 328/2001</i>.</p>

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<b>C</b>	<b>EMPLOYABILITY &amp; FURTHER EDUCATION</b>
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1	EMPLOYABILITY	<p>Upon successful completion of the Program follows the enrollment in the Italian Register of Engineers in the Section A (senior Engineer), Information sector (as established in the D.P.R. 328/2001).</p> <p>Graduates are eligible to work as Electronics Engineers who have fulfilled the requirements of European Directive 92/51/EEC for the mutual recognition of professional qualifications (within EU and beyond).</p> <p>Graduates are suitable for careers as electronics engineers and can fill the increasing demand for electronics expertise across a widening array of applications in both the industrial and information engineering fields.</p>
2	FURTHER STUDIES	<p>The Master Degree in Electronics Engineering normally gives ability to direct access to a wide range of PhD degrees, in the fields encompassed on engineering areas.</p> <p>It also gives access to some specialist professional courses.</p>

D	EDUCATION STYLE	
1	LEARNING & TEACHING APPROACHES	Lectures, group-work, individual study and autonomous learning, interprofessional training, self directed learning program and work placement.
2	ASSESSMENT METHODS	Assessment is normally by means of an oral or written examination. The final exam consists in the discussion of an original work, carried out under the supervision of a professor, and described through a written text. It is aimed at demonstrate that the candidate has acquired the essential professional skills and competencies related to the professional profile.

E	PROGRAMME COMPETENCES	
1	GENERIC	
	<p>During the two-year master, students in Electronics Engineering acquire a very broad general and specific education. Upon the successful completion of the degree they become electronics engineers. The degree program meets the competences and quality assurance procedures required by both the Italian Register of Engineers and the National Higher Education Quality Assurance Agency (AVA) for the second level degree courses.</p> <p>This provides the generic competencies expected for the second cycle graduates:</p> <ul style="list-style-type: none"> <li>— <b>Analysis and synthesis:</b> knowledge and understanding of complex issues regarding their profession identifying relationships between the various domains of science; ability to critically and systematically integrate knowledge and analyze, assess and deal with complex phenomena, issues and situations even with limited information;</li> <li>— <b>Creativity:</b> ability to design, conduct experiments, and analyze and report results in accordance with the applicable standards in more than one technical area, autonomously and with an original contribution, using appropriate methods;</li> <li>— <b>Leadership, Management and Team-working:</b> ability to assume employment status of high responsibility in public or private organizations, or in self-employed, demonstrating awareness of ethical aspects of the own role and contribution within this; ability to work, both independently and in teams, with technical and scientific problems of high complexity and to put the work into a broader context which involve the industry and society;</li> <li>— <b>Communication skills:</b> ability to communicate both orally and in writing, in first language and in another European language, using appropriate scientific terminology;</li> <li>— <b>Learning ability:</b> ability to identify by himself the need for further knowledge and take responsibility for his/her ongoing learning; ability to consult specialized literature, to permanently update knowledge and skills and to be familiar with recent scientific findings and developments in Electronics Engineering, and ability to formulate a critical opinion;</li> <li>— <b>Problem solving:</b> ability to identify engineering problems, understand existing requirements and/ or constraints, articulate the problem by means of technical communication and formulate alternative creative solutions.</li> </ul>	
2	SUBJECT SPECIFIC	

	<p>The Program meets all the Specific Competences, as established and agreed in collaboration with the field stakeholders taking into consideration the standards for the second cycle recommended by EUR-ACE for accreditation of engineering programs, clustered within the key overarching competences summarized below.</p> <p>The graduates must demonstrate:</p> <p><b>Knowledge of</b></p> <ul style="list-style-type: none"> <li>- the principal branches of mathematics relevant to Electronics Engineering (arithmetic, geometry, algebra, trigonometry, analysis, calculus, differential equations, numerical methods and linear algebra);</li> <li>- the physics for understanding the structure and principles that govern the natural and artificial world for obtaining solutions to problems, by means of the design of complex systems;</li> <li>- the basic sciences and the transformations and interactions of energy and signals, which affects the functionality of electronic systems;</li> </ul> <p><b>Comprehension of</b></p> <ul style="list-style-type: none"> <li>- the Electronics engineering principles finalized to design products and electronics systems;</li> <li>- the relationship between the theoretical models of an electronic system and its useful properties;</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>- ability to apply logical reasoning and quantitative calculation, and to use mathematical language;</li> <li>- ability to solve electronic engineering problems using differential equations, numerical methods, calculus-based physics and chemistry;</li> </ul> <p><b>Analysis</b></p> <ul style="list-style-type: none"> <li>- ability to safely conduct electronic engineering experiments according to established procedures, and analyze, interpret, and report the results;</li> <li>- ability to analyze and solve electronic engineering problems in a creative and effectively way, using basic principles, modern techniques and systematic approach;</li> </ul> <p><b>Synthesis</b></p> <ul style="list-style-type: none"> <li>- ability to design electronic engineering experiments to investigate a phenomenon, conduct the experiment safely, and analyze and interpret the results;</li> <li>- capacity to contribute to innovation and practical implementation of ideas for a new electronic system, industrial products, and in advanced industrial research;</li> <li>- ability to perform a feasibility study, for industrial product development or to design a new electronic system, from the customer need, by using the best engineering practices and by performing investment analyses or other economic considerations;</li> </ul> <p><b>Evaluation</b></p> <ul style="list-style-type: none"> <li>- ability to assess the need to implement changes in electronic systems by improving product quality, environmental impacts and increased production;</li> <li>- ability to assess the impact of engineering solutions in societal context and to apply engineering principles for the development of sustainable processes.</li> </ul>
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F	<p><b>COMPLETE LIST OF PROGRAMME LEARNING OUTCOMES</b></p>
	<p>The Master course in Electronic Engineering has a broad spectrum approach, offering expertise in areas ranging from technologies to the design of circuits and systems, that are applied in diverse applications. On completion of the award, students will be able to:</p> <ul style="list-style-type: none"> <li>- competently use professional skills and knowledge in the systematic development of complex Electronic Engineering systems;</li> <li>- demonstrate a deeper understanding of some areas of Electronic Engineering;</li> <li>- apply their skills and knowledge in a professionally responsible manner;</li> <li>- communicate effectively with other engineers and the wider global community using a wide range of communication technologies;</li> <li>- work professionally as an individual and in a team;</li> <li>- understand and describe the processes through which current knowledge was developed;</li> <li>- develop engineering solutions appropriate to the social, political, international, economic and environmental contexts in which they are applied;</li> <li>- engage in the process of continuing learning needed to retain the necessary level of professional skills and knowledge in the area of Electronic Engineering;</li> <li>- contribute successfully to project management;</li> <li>- plan and execute a research project, applying relevant methodologies and knowledge;</li> <li>- apply research skills appropriate to postgraduate research or advanced industrial investigation.</li> </ul>

