



Programme of Course "Electronic Technologies"

- Code: I0027
- Type of course unit: Elective (Laurea in Ingegneria dell'Informazione curriculum Elettronica)
- Level of course unit: Undergraduate Degrees
- Semester: 2

Number of ects credits: (Laurea in Ingegneria dell'Informazione) 9 (workload 225 hours)

Teachers: Vincenzo Stornelli

1	Course objectives	The goal of this course is to provide the main concepts on micro and nano electronic technologies. Also general concepts on CMOS technology and imagers, discrete PCB design and implementation and thermal aspects are provided. On successful completion of this module, the student should understand the fundamental concepts and theoretical aspects of micro and nano technologies fabrication process.
2	Course content and learning outcomes (dublin descriptors)	<p>Topics of the module include:</p> <ul style="list-style-type: none"> • Introductory Elements: vacuum and plasma. • Lithography: Polysilicon, Deposition by Chemical Vapor Deposition (CVD), mechanism of the process, systems for CVD deposited films, Plasma Enhanced Chemical Vapor Deposition, Copper film • Photolithography: process, resist, limitations, wet etching, dry etching, Reactive Ion Etching, problems of various processes, Chemical Mechanical Polishing, Diffusion. Ionic implantation • Future developments in technologies: electrical measurements, optical microscopy and chemical analysis • CMOS technology and imagers: the theory of color, quality image and image processing algorithms • Memories: Up to date technologies in advanced memories design, structure and basic devices • Discrete electronic technologies: Printed Circuit Board design and implementation and thermal aspects <p>On successful completion of this module, the student should :</p> <ul style="list-style-type: none"> • have profound knowledge of the basic principles of photolithography, have knowledge and understanding of the relevant micro and nano technologies • understand and explain the behavior of discrete electronic technologies.
3	Course prerequisites	The student must have basic notions in electronics and physics, contained in the exams of Physics I and Elettronica I.
4	Teaching methods and language	<p>Lectures and exercises</p> <p>Language: English</p> <p>Reference textbooks</p> <ul style="list-style-type: none"> • S.M. Sze, Semiconductor devices: physics and technology. J. Wiley and Sons . 2002.
5	Assessment methods	Oral exam.