

**Programme of “Tecnologie Elettroniche”
“Electronic Technologies”:**

Number of ECTS credits: 9 (workload is 225 hours; 1 credit = 25 hours)

I0027 e IIE072, Optional

1st CYCLE IN INFORMATION ENGINEERING and 2nd Cycle in ELECTRONIC ENGINEERING, 3rd and 2nd year, 2nd semester

Teacher: **Vincenzo Stornelli**

1	Course objectives and Learning outcomes	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	Dublin descriptors	<p>Topics of the module include:</p> <p>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.</p> <p>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.</p> <p>Discrete electronic technologies: Printed Circuit Board design and implementation and thermal aspects.</p> <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	Prerequisites and learning activities	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	Lectures and exercises. Language: Italian/English Ref. Text book S.M. Sze, Semiconductor devices: physics and technology, J. Wiley & Sons (2002)
5	Assessment methods	Oral exam.