Course Title	**Semiconductor Processing Technology**				
Course Code	**MME 562**				
Course Type	**Elective**				
Level	Graduate				
Year / Semester	Spring Semester				
Teacher's Name	Special Scientist				
ECTS	8	Lectures / week	2x1.5 hrs	Laboratories / week	--
Course Purpose and Objectives	The purpose of the course is to familiarize the student with the various modern semiconductor-processing techniques, from crystal growth to device packaging. By the end of the course, students will be able to explain the basic fabrication steps one needs to follow in fabricating an integrated circuit-based device and to differentiate between the various available techniques for those fabrication steps.				
Learning Outcomes	• Describe techniques used for growth of monocrystalline silicon ingots and wafer preparation • Describe processes used to control contamination in silicon wafers • Describe processes employed for silicon surface oxidation and uses of the formed silicon dioxide layer • Describe commonly used metallization techniques in the fabrication of devices • Describe commonly used photolithography techniques in the fabrication of devices • Describe commonly used etching techniques in the fabrication of devices • Describe commonly used doping techniques in the fabrication of devices • Describe commonly used packaging techniques in the fabrication of devices				
Prerequisites	NO	Required	NO		
Course Content	Elemental and compound semiconductors – Growth of semiconducting crystals – Wafer preparation –Thermal oxidation and nitridation – Silicon dioxide and interface SiO2-Si – Growth of thin films – Physicochemical processes of growth - Chemical vapor deposition –Physical vapor deposition – Lithography – Optical lithography – Techniques for improving resolution – Electron beam lithography – X-ray lithography – Ion beam lithography – Control of purity and etching – Purity processes – Etching – Ion implantation – Destruction of crystal and activity of dopants – Diffusion sources -				

	Non constant diffusion coefficient – Diffusion in polycrystalline Si – Diffusion in insulators –– Gettering in Si – Contact and interconnect technology – Contact metallization – Multimetal dielectrics – Metallic interconnects – Interlevel dielectrics – Multilevel metals – Reliability
Teaching Methodology	Lectures, power point presentations Communicative, Collaborative During the first week of the semester, the Syllabus of the course is given by the teacher, which includes information on the course content, expected learning outcomes, assessment and office hours
Bibliography	Peter Van Zant (2000) *Microchip Fabrication – A practical guide to semiconductor processing (4th Edition)*, McGraw-Hill; Gary S. May and Simon M. Sze (2004) *Fundamentals of Semiconductor Fabrication*, Wiley. Lecture Notes
Assessment	Home Exercises: 20%, Midterm Exam: 30%, Final Exam: 50%
Language	English