

Module Title:	Semiconductor Technology 4
Academic year:	2009 – 2010
Credit Value:	5 - Elective
Pre- requisites:	Semiconductor Technology
Assessment:	70% Final Exam, 20% Practical, 10% Continuous Assessment (C.A.)
Aims	For the student to know and understand some of the challenges to be overcome during the design and fabrication of sub-micron CMOS devices and to know how to evaluate suitable new materials that may be used in future generations of CMOS devices.
Module Content	<ul style="list-style-type: none"> • The submicron MOSFET • Hot carrier resistant processing and device structures • Thin gate oxides growth and reliability • Interconnection technology • Materials characterisation of techniques for VLSI • Practical content
Intended Learning Outcomes:	<p>On successful completion of the module the student will be expected to be able to:</p> <ol style="list-style-type: none"> 1. Discuss the development of fabrication of the submicron CMOS MOSFETs. 2. Discuss the developments in research on new materials for submicron MOSFETs and write a report based on a review of selected published scientific research papers. 3. Explain mechanisms of gate oxide breakdown and use oxide breakdown data to calculate the minimum oxide thickness required in submicron MOSFETs for a given time to breakdown under specific operating conditions. 4. Use oxide breakdown data to determine the burn in parameters required for specified accelerated aging of gate dielectrics. 5. Analyse experimental data and write short laboratory reports. 6. Evaluate the capabilities of materials characterisation techniques for the study of materials used for submicron MOSFET device fabrication.