

<b>Short Title:</b>	Semiconductor Fabrication <b>APPROVED</b>
<b>Full Title:</b>	Semiconductor Fabrication
<b>Language of Instruction:</b>	English

<b>Module Code:</b>	SEMT H3001
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<b>Credits:</b>	5
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<b>Field of Study:</b>	Electronics and automation
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<b>Module Delivered in</b>	<a href="#">3 programme(s)</a>
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<b>Reviewed By:</b>	JAMES WRIGHT
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<b>Module Author:</b>	JAMES WRIGHT
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<b>Module Description:</b>	The aim of semiconductor fabrication is to introduce the student to the clean room laboratory where they will learn how to work safely and manufacture simple semiconductor devices. Furthermore the student will know and understand the challenges to be overcome during the fabrication process and will understand how to characterise the performance of a device fabricated in the laboratory.
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Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Describe the standard silicon device fabrication processes and equipment.
LO2	Explain the physics of silicon device operation and fabrication.
LO3	Define a problem, gather & analyse experimental data, evaluate a solution as part of a project, write laboratory reports while considering all ethical implications
LO4	Fabricate a basic semiconductor device using the process facilities of the Semiconductor Laboratory
LO5	Test and analyse the performance of the fabricated device.
LO6	Communicate effectively as part of a team, as well as formally presenting their findings verbally and in written documents.

**Module Content & Assessment**

<b>Course Work</b>				
<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Continuous Assessment	Introduction to the clean room and safety.	1,4	2.50	Week 2
Assignment	Assignment on Vacuum Basics and Metallisation	1,2,4	2.50	Week 4
Assignment	Assignment based on the modelling/ simulation of individual process steps.	1,2,4	2.50	Week 6
Assignment	Assignment based on Photolithography	1,2,4	2.50	Week 8
Continuous Assessment	Group project based on the design of the final testing experiment including analysis of results.	3,5,6	5.00	Week 10
Continuous Assessment	Individual report on the fabrication and analysis of a MOSCAP semiconductor device.	1,2,3,4,5	30.00	Week 12
Project	Integrated Project contribution to the CA score	6	5.00	Sem 1 End

<b>End of Module Formal Examination</b>				
<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Formal Exam	End-of-Semester Final Examination	1,2,3,4,5	50.00	End-of-Semester

TU Dublin – Tallaght Campus reserves the right to alter the nature and timings of assessment

**Module Workload**

<b>Workload: Full Time</b>				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	class time	2.00	Every Week	2.00
Lab	Practical work	2.00	Every Week	2.00
Independent Learning	Outside of class	4.00	Every Week	4.00
Total Weekly Learner Workload				8.00
Total Weekly Contact Hours				4.00

<b>Workload: Part Time</b>				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Class time	2.00	Every Week	2.00
Lab	Practical work	2.00	Every Week	2.00
Independent Learning	Outside of class	4.00	Every Week	4.00
Total Weekly Learner Workload				8.00
Total Weekly Contact Hours				4.00

## Module Resources

### *Recommended Book Resources*

**Peter Van Zant 2014, *Microchip Fabrication*, 6th Ed. Ed., McGraw-Hill Education [ISBN: 9780071821018]**

**Gary S. May, Simon M. Sze 2007, *Fundamentals of semiconductor fabrication*, Wiley Hoboken, NJ [ISBN: 978-0-471-23279-7]**

**Yale E, Brundle R & Evans C 2010, *Characterisation in Silicon Processing*, 1st ed Ed., Momentum Press [ISBN: 978-1606501092]**

**May G. S. & Spanos C.J 2006, *Fundamental of Semiconductor Manufacturing and Process Control*, 1st ed Ed., Wiley Blackwell [ISBN: 987-0471784067]**

*This module does not have any article/paper resources*

### *Other Resources*

**Moodle course notes: *Complete set of course notes available on Moodle platform***

**Module Delivered in**

<b>Programme Code</b>	<b>Programme</b>	<b>Semester</b>	<b>Delivery</b>
TA_EAELE_B	<a href="#">Bachelor Degree in Engineering (Honours) in Electronic Engineering</a>	5	Mandatory
TA_EAELE_D	<a href="#">Bachelor of Engineering in Electronic Engineering</a>	5	Mandatory
TA_EELEC_D	<a href="#">Bachelor of Engineering In Electronic Engineering - Add On Year</a>	1	Mandatory