

MODULE DESCRIPTOR

Module Title

Advanced Electronics

Reference	EN4512	Version	8
Created	November 2022	SCQF Level	SCQF 10
Approved	March 2004	SCQF Points	15
Amended	August 2023	ECTS Points	7.5

Aims of Module

To provide the student with the ability to analyse, synthesise, simulate and implement complex electronic systems.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Report on the creation and testing of complex mixed-signal systems
- 2 Demonstrate ability to work in a team as a developed communicator with technical knowledge
- 3 Analyse complex problems in the context of analogue & digital systems

Indicative Module Content

High/Radio Frequency transmission line theory and Smith Chart analysis, Design of dynamic circuits employing control and feedback theory, Circuit noise sources and noise estimation techniques, Temperature compensation in circuits, Interference and compatibility between systems, including EMC considerations. Principles of high-speed digital circuit design, reliability issues, system minimisation. HDL design flow: system design and synthesis using HDL and software tools. System-level design of complex digital designs, SoC, implementation using Field Programmable devices (e.g. FPGA). Intellectual Property considerations (usage, licensing, etc)

Module Delivery

This is a predominantly lecture-based course supplemented with tutorial sessions. The HDL content is lab-based.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	40	40
Non-Contact Hours	110	110
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type: Coursework Weighting: 70% Outcomes Assessed: 1, 2

Description: Summary design report and technical presentation in a group setting.

Component 2

Type: Examination Weighting: 30% Outcomes Assessed: 3

Description: Closed book examination.

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 30% and C2 is worth 70%.

		Examination:						NS
		A	B	C	D	E	F	
Coursework:	A	A	A	B	B	E	E	
	B	B	B	B	C	E	E	
	C	B	C	C	C	E	E	
	D	C	C	D	D	E	E	
	E	E	E	E	E	E	F	
	F	F	F	F	F	F	F	
	NS	Non-submission of work by published deadline or non-attendance for examination						

Module Requirements

Prerequisites for Module Electronics 3 (EN3512), or its equivalent.

Corequisites for module None.

Precluded Modules None.

ADDITIONAL NOTES

An Indicative Bibliography will normally reference the latest edition of a text. In some cases, older editions are equally useful for students and therefore, those are the editions that may be stocked.

INDICATIVE BIBLIOGRAPHY

- 1 BEASLEY, J.S. and MILLER, G.M., 2014. Modern Electronic Communication. 9th ed. Essex: Pearson.
- 2 JOHNSON, H. and GRAHAM, M., 1993. High Speed Digital Design. 2nd ed. Upper Saddle River, NJ: Prentice Hall.
- 3 ROTH, C.H., 2017. Digital Systems using VHDL. 3rd ed. Boston, MA: PWS Publishing.
- 4 SEDRA, A.S. and SMITH, K.C., 2014. Microelectronic Circuits. 7th ed. New York, NY: Oxford University Press.
- 5 WILLIAMS, T., 2016. EMC for Product Designers. 5th ed. Oxford: Newnes.