Module Title **Electronics 2** **Keywords** Combinational And Sequential Circuits, Feedback Amplifiers, Data Converters, Hardware Description Languages	Reference EN2510 SCQF SCQF Level 8 SCQF Points 15 ECTS Points 7.5 Created May 2002 Approved March 2004 Amended August 2011 Version No. 2

This Version is No Longer Current

The latest version of this module is available here

Prerequisites for Module

Introduction to Electronics (EN1510) or the equivalent.

Corequisite Modules

None.

Precluded Modules

None.

Aims of Module

To provide the student with the knowledge and skills to enable analysis, synthesis and design of basic standard circuit configurations of analogue and digital circuits, and the use of hardware description languages.

Simple transistor (low-frequency) model. Analysis and synthesis of feedback circuits, two-transistor feedback amplifiers.
Non-ideal operational amplifier, typical operational amplifier circuit configurations and applications, eg amplifiers, filters, oscillators.

Indicative Student Workload

Contact Hours	Full Time	Part Time
Assessment	2	2
Lectures/Tutorials	36	36
Practical Exercises	9	9
Directed Study		
Directed Self Study/Coursework preparation	40	40
Private Study		
Private Study	63	63

Learning Outcomes for Module

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

1. Analyse the behaviour of standard digital circuits.
2. Analyse the behaviour of standard analogue circuits.
3. Design and simulate standard digital circuits.
4. Design and simulate standard analogue circuits.

Indicative Module Content

Data conversion, Introduction to ADC and DAC circuits.

Identification, analysis and elimination of circuit hazards. MSI circuits, including encoders, decoders, multiplexers, demultiplexers, applications.
Sequential circuits, flip-flop types, characteristic equations, synchronous counters, shift registers; flow diagram representation of digital systems. Introduction to basic concepts and use of, Algorithmic State Machines; applications in sequential circuits. Introduction to programmable devices. Introduction to VHDL coding

Mode of Delivery

This is a lecture based course supplemented with tutorial sessions, laboratory exercises and student centred learning.

Assessment Plan

	Learning Outcomes Assessed
Component 1	3,4
Component 2	1,2,3,4

Component 2 is closed book examination. (70% weighting)

Component 1 is coursework based on laboratory investigations on circuit design/simulations; the result of which will be presented in an appropriate medium. (30% weighting)

Indicative Bibliography

1. BEARDS, P., 2002. Analog and Digital Electronics: A First Course. 2nd ed. Upper Saddle River, NJ: Prentice Hall.
2. FLOYD, T., 2015. Digital Fundamentals. 11th ed. Upper Saddle River, NJ: Prentice Hall.
3. KATZ, R. and BORRIELLO, G., 2005. Contemporary Logic Design. 2nd ed. Upper Saddle River, NJ: Prentice Hall.

Introduction to VHDL coding of digital systems.

4.ROTH, C.H., 2013. Fundamentals of Logic Design. 7th ed. Boston, MA: Thomson Brooks/Cole.