



Institiúid Teicneolaíochta Chorcaí
Cork Institute of Technology

ELTR6002: Analogue Electronics 1

Module Details

Short Title:	Analogue Electronics 1 APPROVED		
Full Title:	Analogue Electronics 1		
Module Id:	2769		
Official Code:	ELTR6002	NFQ Level:	6
		ECTS Credits:	5

Coordinator:	JOSEPH CONNELL
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Description:	This module explores the processing, storage, and communication of signals, and how they represent information. The semiconductor diode and its application in passive circuits is also studied.
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Learning Outcomes:

On successful completion of this module the learner will be able to...

1. Distinguish between continuous and discrete information sources and signals, and describe commonly used transducers for generating these signals.
2. Explain standard waveform terminology and demonstrate the ability to calculate amplitude, frequency, and phase values for repetitive waveforms.
3. Discuss the concepts of complex waveforms and frequency spectra, and display a basic understanding of electromagnetic waves and telecommunication systems.
4. Explain the principles of amplification and bandwidth, calculate decibel gain, and sketch frequency response plots on log-linear graph paper.
5. Display a basic understanding of semiconductor doping, pn-junction theory, and the application of diodes in rectifier and other circuits.

Pre-requisite learning

Module Recommendations

This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named CIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).

No recommendations listed

Incompatible Modules

These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.

No incompatible modules listed

Module Requirements

This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.

No requirements listed



Module Content & Assessment

Indicative Content

• Information and Transducers

Continuous and discrete information sources and signals. Commonly used transducers for generating signals from information sources.

• Waveform Terminology

Standard waveform terminology, calculation of amplitude, frequency, and phase values for repetitive waveforms.

• Complex Waveforms

Overview of complex waveforms, harmonically related sine waves, and frequency spectra. Principles of electromagnetic radiation and telecommunication systems.

• Signals and Amplifiers

Principles of amplification, bandwidth, and frequency response. Calculation of decibel power and voltage gains, use of log-linear graph paper for frequency response plots.

• Semiconductor Theory

Basic theory of atomic bonding, semiconductor doping and conduction, pn-junctions, drift and diffusion current. Effects of temperature variation on biased pn-junctions.

• Diode Applications

Silicon diode characteristics, ac resistance, data sheet. The diode as a 2-state device. Load-line analysis of simple diode circuit. Operation of half-wave and full-wave rectifier circuits, and the effects of capacitor smoothing. Examples of other diode applications such as clippers, clamping, and voltage multipliers.

• Laboratory Programme

Resistance identification and measurement. Use of Oscilloscope and Function Generator. Diode characteristics, and applications in clipping, clamping, and voltage doubling circuits. Half-wave and full-wave rectifier circuits. Capacitor-smoothed rectifiers. Demonstrations to enhance understanding of key points arising during the programme, and to illustrate correct use of laboratory equipment.

Assessment Breakdown	%
Course Work	40%
End of Semester Formal Examination	60%

	Outcome addressed	% of total	Assessment Date
Formal End-of-Semester Examination	1,2,3,4,5	60%	Semester End

Coursework Breakdown				
Type	Description	Outcome addressed	% of total	Assessment Date
Open-book Examination	Assessment of lecture material covered during weeks 1 to 6	1,2,3,4	10	Week 7
Practical/Skills Evaluation	Continuous assessment of Laboratory Programme.	2,5	30	Every Week

The institute reserves the right to alter the nature and timings of assessment



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Module Workload & Resources

Workload		Full-time mode		
Type	Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Class based instruction and discussion.	3	Every Week	3.00
Lab	Laboratory based exercises and demonstrations.	2	Every Week	2.00
Independent & Directed Learning (Non-contact)	Further study of class material and recommended resources.	2	Every Week	2.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				5.00

Workload		Part-time mode		
Type	Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Class based instruction and discussion.	3	Every Week	3.00
Lab	Laboratory based exercises and demonstrations.	1	Every Week	1.00
Independent & Directed Learning (Non-contact)	Further study of class material and recommended resources.	3	Every Week	3.00
Total Weekly Learner Workload				7.00

Resources	
Recommended Book Resources	
• Thomas Floyd 2007, <i>Electronic Devices</i> , 8th Ed., Pearson International [ISBN: 0136155812]	
Supplementary Book Resources	
• Neil Storey 2004, <i>Electrical & Electronic Systems</i> , Pearson Prentice-Hall [ISBN: 0130930466]	