



Institiúid Teicneolaíochta Chorcaí  
Cork Institute of Technology

## ELTR6003: Analogue Electronics 2

### Module Details

<b>Short Title:</b>	Analogue Electronics 2 <b>APPROVED</b>		
<b>Full Title:</b>	Analogue Electronics 2		
<b>Module Id:</b>	2770		
<b>Official Code:</b>	ELTR6003	<b>NFQ Level:</b>	6
		<b>ECTS Credits:</b>	5

<b>Coordinator:</b>	JOSEPH CONNELL
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<b>Description:</b>	This module covers the analysis and design of voltage regulators and bipolar and MOSFET transistor amplifiers.
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### Learning Outcomes:

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

1. Design and analyse simple voltage regulator circuits.
2. Describe bipolar junction, and MOSFET transistor structure, symbols, currents, and characteristics, and interpret data sheets.
3. Describe the operation of both bipolar and MOSFET transistors in linear and switching applications.
4. Compare transistor bias arrangements.
5. Design and analyse common emitter and common source transistor amplifier 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).*

Analogue Electronics 1

#### 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 &amp; Assessment

## Indicative Content

**• Zener diodes and Regulators**

Zener breakdown, characteristics, and parameters. Principles of voltage regulator circuits. Stabilisation ratio, line and load regulation. Typical zener diode applications such as signal clipping, voltage reference, and overload protection.

**• Bipolar Junction and MOSFET Transistors**

Structure and symbols, case outlines and data sheets. Bias voltages, currents, and equations for linear operation. Leakage current. Typical applications for different configurations.

**• Transistor Operation**

Common emitter and MOSFET transfer characteristics. Load line analysis and power dissipation curves. Saturation and cutoff points. Transistor as a switch.

**• Transistor Biasing**

Quiescent point stability. Biasing considerations.

**• Common Emitter/Source Amplifiers**

Coupling and bypass capacitors. Common emitter and common source amplifiers.

**• Laboratory Programme**

Zener diode characteristics. Line and load regulation. Transistor identification and testing. Common emitter/source transistor amplifiers; quiescent voltages and currents, ac voltage gain, applications using LEDs and LDRs. Component catalogues. 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	10	Week 7
Practical/Skills Evaluation	Continuous assessment of laboratory programme.	1,2,3,4,5	30	Every Week

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



## Module Workload &amp; 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	
<i>Recommended Book Resources</i>	
• Thomas Floyd 2007, <i>Electronic Devices</i> , 8th Ed., Pearson International [ISBN: 0136155812]	
<i>Supplementary Book Resources</i>	
• Neil Storey 2004, <i>Electrical &amp; Electronic Systems</i> , Pearson Prentice-Hall [ISBN: 0130930466]	
<i>Other Resources</i>	
• Websites: <i>To be advised at commencement of study period.</i>	