

## Liverpool John Moores University

Title: Linear Electronics  
Status: Definitive  
Code: **5304CIT** (125302)  
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering  
Teaching School/Faculty: Changshu Institute of Technology

Team	Leader
Christopher Wood	Y

**Academic Level:** FHEQ5      **Credit Value:** 10      **Total Delivered Hours:** 50  
**Total Learning Hours:** 100      **Private Study:** 50

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	32
Practical	16

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Exam	50	2
Practice	Design	Circuit Design	25	
Report	Coursework	Coursework	25	

### Aims

*The module aims to broaden the students' knowledge and understanding of linear electronic circuit design, and also to provide students with practical skills necessary to design, analyse and simulate and manufacture electronic circuits.*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Discuss analogue circuit operations and design for signal measurement, data acquisition and processing
- 2 Design, evaluate and produce op-amp based filter, amplifier, D/A, and A/D circuits
- 3 Use CAD tools for circuit design and simulation
- 4 Use CAD tools for PCB-level, simulation

### Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Exam	1	2	3
Circuit Design	2	3	4
Coursework	2	3	4

### Outline Syllabus

#### 1. Amplifier circuits

- *Review of transistors: modeling, biasing and amplifiers.*
- *Linear integrated circuits: differential amplifiers, current mirrors. Power control: regulation, rectification and power amplification.*

#### 2. Op-amp applications

- *Design of analogue systems using op-amps: active filters, oscillators, A/D converters*
- *for measurement, instrumentation and data acquisition, understanding relevant parameters such as bandwidth, precision, slew rate, feedback, stability.*

#### 3. CAD tools

- *Use NI Multisim for circuit design and simulation*
- *Use NI Ultiboard for PCB-level design and simulation*

### Learning Activities

A combination of lectures, and practical work using NI Software.

### Notes

This course will provide undergraduate students in electronic design with intermediate level tools and skills necessary to design, test and implement and manufacture electronic circuits.