

Liverpool John Moores University

Title: ELECTRONIC CIRCUITS AND DEVICES
Status: Definitive
Code: **4512NCCG** (129431)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Nelson Campus

Team	Leader
Christian Matthews	Y

Academic Level: FHEQ4 **Credit Value:** 20 **Total Delivered Hours:** 60
Total Learning Hours: 200 **Private Study:** 140

Delivery Options

Course typically offered: S1, S2, Sum, NS2 (S2 for Jan)

Component	Contact Hours
Lecture	36
Practical	24

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Assignment	Assignment	100	

Competency	NCC Group Pass/Fail
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Aims

This module introduces students to the use of electronics manufacturers' data to analyse the performance of circuits and devices, the operational characteristics of amplifier circuits, the types and effects of feedback on a circuit performance, and the operation and application of oscillators. They will also be introduced to the application of testing procedures to electronic devices and circuits, and use the findings of the tests to evaluate their operation. Among the topics included in this

module are: power amplifiers, class A, B and AB; operational amplifiers, inverting, non-inverting, differential, summing, integrator, differentiator; types such as open, closed, positive and negative feedback; frequency, stability, frequency drift, distortion, amplitude, wave shapes and testing procedures.

Learning Outcomes

After completing the module the student should be able to:

- 1 Determine the operational characteristics of amplifier circuits.
- 2 Investigate the types and effects of feedback on an amplifier's performance.
- 3 Examine the operation and application of oscillators.
- 4 Apply testing procedures to electronic devices and circuits.

Learning Outcomes of Assessments

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

Assignment	2	3
NCC Group Pass/Fail	1	4

Outline Syllabus

Power amplifiers

Operational amplifiers: gain, bandwidth, frequency response, input and output impedance, distortion and noise, applications

Feedback types and effects

Effect of feedback on gain, bandwidth, distortion, noise, stability, input and output impedance

Oscillators: types of oscillators, stability, frequency drift, distortion, amplitude and wave shapes

Testing procedures: measuring performance, practical tests, computer simulations

Learning Activities

Lectures

These will not normally be traditional didactic lectures in which the student plays little active part, but will be delivered in small groups of up to 20 students in which their interaction with their tutor is a key ingredient of their learning experience.

The material of this module requires the development of significant practical skill. This will be taught within the lecture time, making these sessions a blend of lecture and workshop time. The sessions will be timetabled in spaces with physical resources appropriate to the delivered content.

Students will receive approximately 30 hours of taught material, supported by in-class exercises and discussions designed to help student assimilate learning and to

provide early informal feedback on their progress.

Practical Work

This module contains directed practical work that students will undertake under the supervision of teaching staff and/or technicians. Some elements of this practical work will form part of the assessment for this module.

Independent Study

Students are expected to undertake personal reading and research into topic areas that have been stimulated from the lectures and seminars. This reading will enhance their academic work and enable valid contribution to lectures and seminars.

VLE support

This will provide links to academic web-sites and on-line journals, facilitate group discussion outside of the classroom, access to outline lecture notes, and provide students with assessment details.

Notes

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