Liverpool John Moores University

Title:	ANALOGUE ELECTRONICS
Status:	Definitive
Code:	**5508TECSBC** (113896)
Version Start Date:	01-08-2016

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: The Sino-British College

Team	Leader
Clifford Mayhew	Y

Academic Level:	FHEQ5	**Credit Value:**	12	**Total Delivered Hours:**	37
Total Learning Hours:	120	**Private Study:**	83		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Lecture	20
Practical	5
Tutorial	10

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	60	2
Report	AS2	Coursework	40	

Aims

The module aims to broaden the students' knowledge and understanding of analogue circuits, and also to provide students with skills necessary to design, analyse and implement electronic circuits.

Learning Outcomes

After completing the module the student should be able to:

1   Describe the components used in analogue electronic circuits
2   Design, analyse and implement transistor circuits
3   Design, analyse and implement basic op-amp. circuits.
4   Demonstrate a clear understanding of the terms such as output power, power gain, voltage gain and frequency response.
5   Design and analyse differential amplifiers, push-push amplifiers and current sources and their applications

Learning Outcomes of Assessments

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

EXAM   1   2   3   5

CW   2   3   4

Outline Syllabus

Basic semiconductors devices Introduction:
PN junction/Diodes, MOSFET and Bipolar transistor.
Basic amplifier circuit design and analysis:
Bias, Small signal model, Analysis, basic and cascaded configuration, low frequency response, miller's theorem and high frequency response.
Amplifier topologies:
Differential amplifiers and push-pull amplifiers.
Power supplies:
Regulation, rectification and power amplification.
Operational amplifiers

• Feedback: Positive and negative feedback.

• DC performance: input/output resistance, open/close loop gain, differential mode gain, common mode gain, common mode rejection ratio.

• Linear circuits : inverting and non-inverting, summing and difference, current to voltage converter, integrator and differentiator

• Non-linear circuit : Rectifier and limiters, Comparators and Schmitt triggers

• Non-ideal op-amps : Bias currents, offset voltage.
Current source:
Principle, analysis and application of Wilson Current source, Widlar current source.
Noise:
Type of noise, statistical basis, noise power, noise equivalent circuits.

Learning Activities

By a combination of lectures, tutorials, and laboratory design assignments.

Notes

This Level 2 module will provide undergraduate students in electronic engineering with intermediate level tools and skills necessary to design, test and implement electronic systems.