LONDON SOUTH BANK UNIVERSITY

Module guide

Analogue Electronics

EEA_5_450

Faculty of ESBE

2012/13

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Unit Title	Analogue Electronics
Unit Code	EEA-5-450
Level	5
Prerequisites	Electrical Principles
Course	HND/C Electrical & Electronic Engineering
Organisation	HND: 48 hours lecture/laboratory 102 hours self study. HNC: 48 hours lecture/laboratory 102 hours self study.
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1. Introduction

This guide gives you information about the way we intend to teach the syllabus and the order and chronological presentation of topics. This should allow you to prepare for each lecture through selected background reading.
The guide also describes the assessment requirements, methods of assessment and relevant dates.

2. Aims and Objectives

Aims

This unit aims to provide students with a knowledge of a variety of electronic circuits. The unit will emphasise the design and operation of these circuits.

Objectives

After studying this unit, the students will be able to understand the operation of a number of currently used electronic circuits. They will also be capable of designing such circuits to operate to pre-determined specifications by selecting suitable components of appropriate values.

3. Teaching and learning methods

The semester is of 15 weeks duration, 12 weeks of which are allocated to teaching. Teaching consists of two periods of 6 weeks each, separated by a
phase test week. This is followed by a revision week and the final End of Unit examination. Teaching is by 42 hours of lecture/tutorial work with the following weekly contact pattern:

HND: 1 x 2 hrs lecture and a 2 hr laboratory or 1 hr tutorial.
HNC: 1 x 2 hrs lecture and a 2 hr laboratory or 1 hr tutorial

Students will be expected to supplement this with self study to bring the total study time up to the full 150 hrs. Self study will be by directed learning material in the form of questions and tutorial sheets handed out at the appropriate time throughout the unit.

4. Textbooks

Core reading

Analog Electronics	T. E. Price
Prentice Hall	ISBN 0-13-242843-1

Background reading

The Essence of Analog Electronics	Colin Lunn
Prentice Hall	ISBN 0-13-360223-0
Electronic Circuit Analysis and Design	Hayt/Neudeck
Houghton Mifflin Company	ISBN 0-395-32616-8
Electronics	D Crecraft, D Gorham & J Sparkes
Chapman & Hall	ISBN 0-412-41320-5

5. Assessment Schedule

The assessment for this unit consists of 3 components a Phase test weighted at 25%, a laboratory mark weighted at 25% and an End of Unit (EoU) examination weighted at 50%. The exams will take place at the following times:

Phase test	Week 7
EoU	Week 14/15

6. Teaching Schedule

A timetable is given below which sets out the week by week teaching schedule which we hope to follow. A detailed schedule follows which will enable you to be aware of the things you should be able to do after completing your study on each topic.

Weeks 1-3 Power Supply Circuits.

Introduction to Power supply circuits and their operation.

Learning outcome: You should be able to design a simple power supply circuit to meet a pre-determined specification. You should also be familiar with the individual elements of power supplies such as rectification, smoothing and regulation.

Weeks 4-6 Transistor Circuits

Introduction to Transistor circuits and their DC operation.

Learning outcome: You should be able to understand the concept of Biasing and its relevance to the operation of a transistor amplifier. You should be familiar with the different methods of Biasing and be aware of their respective strengths and weaknesses. You should also be capable of designing a number of different biasing circuits by selecting suitable values for individual components

Week 7 Phase test

Week 8-9 Transistor Circuits

Introduction to the ac model for transistor amplifiers.

Learning outcome: You should be able to construct and analyse the ac model for a variety of transistor amplifiers. You should be familiar with the concepts of current and voltage gain and be capable of obtaining actual values for these from your ac model by using the appropriate h parameters.

Weeks 10-13 Operational Amplifier Circuits

Introduction to the operation of Op-Amps and their associated circuitry.

Learning outcome: You should be able to understand how a number of op-amp circuits operate and be capable of designing them to meet a range of specifications. You should be familiar with the concepts of inverting and non-inverting amplifiers and be aware of how negative feedback is used to achieve these. You should also be aware of positive feedback and how it affects the operation of Schmitt trigger and oscillator circuits.

7. Laboratory Work

The laboratory work has been designed to complement the lectures through a series of design and investigative experiments.

Schedule 6 labs of 2 hrs each alternating on a weekly basis with the tutorial session.

Experiment 1 Thevenin's Theorem.

Learning outcome: To understand how the theoretical aspects of Thevenin's Theorem can be applied to different electronic circuits and to practically verify the predicted results.

Experiment 2 Transistor Amplifier.

Learning outcome: To understand the practical operation of a single transistor amplifier by investigating the ac. and dc. parameters under different conditions.

Experiment 3 Compensation for the distortion resulting from op-amp integrators and differentiators

Learning outcome: To introduce practical aspects of op-amp circuitry and understand the operation of integrators and differentiators by investigating them under different conditions.