UNIT GUIDE

Unit Title

Mathematics B

Level

1

Unit Reference

ECM-1-755

Prerequisites

Mathematics A

Courses

HND\HNC Electrical Engineering

Organization

- 36 hours lectures
- 12 hours tutorials
- 90 hours private study

Lecturer

G Nyerges

Unit Coordinator

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Unit Website

http://ecce3.lsbu.ac.uk/staff/nyergeg/www/Units/MATHSB

1. Introduction

The unit guide informs you how the teaching will be structured so that you know what is the order and chronological presentation of topics. This should enable you to prepare for each teaching session. Reference to learning material for self-study made in this guide and the study guides available at the start of the semester will aid your preparation. This preparation is essential because the onus is on you to organize your own studies in order to benefit properly from the tutorial sessions. Each topic is allocated a set time in the teaching schedule. There will be little or no time to reprise previous topics. Any difficulties you may have must be identified before the relevant session and addressed during it.

The guide also describes the assessment requirements and the methods of assessment.

2. Aims and objectives of the unit

Aims

To introduce the basic concepts and elementary techniques of Differential and Integral Calculus relevant to modelling electrical engineering problems.

The unit as whole aims to provide students with mathematical tools to solve engineering problems. The theoretical background for the tools is provided in a fairly informal manner, the emphasis being much more on giving some insight into the techniques rather than on formal rigour.

Objectives

On completion of the unit the student should be able to

• understand the meaning of the derivative of a function and apply the basic rules of differentiation

• use the derivative to solve local minima/maxima/monotonicity problems

• understand the meaning of the definite and the indefinite integral of a function and apply the basic rules of integration

• use the integral to find areas

• understand the idea and importance of differential equations to traditional engineering

• solve basic types of differential equations using standard techniques and formulae.

3. Teaching pattern and indicative content

Teaching Pattern

Week	Lectures
1 & 2	Difference quotients. The derivative as the limit of difference quotients.
3 & 4	Rules of differentiation. Using the derivative to find local minima and maxima.
5 & 6	Using the derivative to find intervals of monotonicity. Approximating the area under the graph of a continuous function. Definite integrals
7	Phase Test
8 & 9	Antiderivatives, indefinite integrals. Using antiderivatives to find definite integrals. Rules of integration.
10 & 11	Elementary differential equations. Solving first and second order linear equations using integration factors
12	Revision

4. Teaching and learning methods

Teaching is by:

• 36 hours lectures

• 12 hours tutorials

The lectures will be based on lecture notes provided by the lecturer. The lectures will be used to

• introduce and explain the main ideas

• illustrate the use of the mathematical techniques by numerous examples

• point out the difficulties and teach mathematical 'tricks'

The students will be encouraged to solve the exercises provided after every major section in the notes. The tutorials are used to discuss problems relating to the lectures and the solution of the exercises.

5. Assessment method

- 1 one-hour Phase Test (40%)

- 1 two-hour end-of-unit exam (60%)

6. Lecture Notes and Textbooks

Core reading

A comprehensive set of lecture notes, exercises and solutions to the exercises will be provided on the web.

Further reading

- Stroud, K.A. *Engineering Mathematics*,
Macmillan Press