UNIVERSITY OF KENT

MODULE SPECIFICATION TEMPLATE

1 The title of the module

EL021 Calculus

2 The Department which will be responsible for management of the module

Engineering and Digital Arts

3 The start date of the module

September 2004

4 The cohort of students (onwards) to which the module will be applicable

5 The number of students expected to take the module

70

6 Modules to be withdrawn on the introduction of this proposed module and consultation with other relevant Departments and Faculties regarding the withdrawal

This module is a reduced version of module EL010 in the Foundation Years in Electronic Engineering, Computer Systems Engineering, Physics and Mathematics. Module EL010 will be withdrawn. The number of lecture hours has been reduced from 48 to 36 although the number of planned examples class hours has been increased slightly. The number of topics covered has been reduced.

7 The level of the module (eg Certificate [C], Intermediate [I], Honours [H] or Postgraduate [M])

F

8 The number of credits the module represents

15

9 Which term(s) the module is to be taught in (or other teaching pattern)

Autumn/Spring

10 Pre-requisite and co-requisite modules

PH020	ALGEBRA AND ARITHMETIC	Co-requisite
MA022	GRAPHS AND GEOMETRY	Co-requisite

11 The programme of study to which the module contributes

BEng Computer Systems Engineering including a Foundation Year

BEng Electronic and Communications Engineering including a Foundation Year

12 The intended subject specific learning outcomes and, as appropriate, their relationship to programme learning outcomes

On successful completion of the module, students should have:
1. A knowledge of Calculus to a level suitable for Level 1 courses;
2. The ability to apply this knowledge to elementary problem solving;
3. The ability to undertake more advanced study of these subjects.

These outcomes contribute to the programme learning outcomes in the ECEwFY and CSEwFY

curriculum maps as follows: A1,B1 and C1

13 The intended generic learning outcomes and, as appropriate, their relationship to programme learning outcomes

For Electronic and Communications Engineering and Computer Systems Engineering Students, this module will contribute to the following programme generic learning outcomes: D5-D7.

14 A synopsis of the curriculum

Lecture Syllabus

DIFFERENTIATION
Graphical interpretation of a derivative and its numerical estimation
Differentiation of y = x squared from first principles
Differentiation of x to the power of n and polynomials by inference
Stationary values (turning points, Max and Min)
Differentiation of trigonometric functions
Differentiation of exponential functions
Differentiation of logarithmic functions
Differentiation of sums, products, quotients and functions of a function
Maclaurens series for sin x, cos x, e to the power of x, ln (1+x), (1+x) to the power of n

INTEGRATION
Comprehension and use of the integral notation symbol
Integration as the inverse operation of differentiation Constant of integration
Integration of polynomials, trigonometric functions and exponential functions
Integration of products and fractions
Integration by substitution (change of variables)
Integration by parts
Use of partial fractions
Integration of compound trigonometric functions
Calculation of the constant of integration
Integration as the process of summation
Definite integrals – calculations of areas
Simple first order differential equations – solution by the method of separation of variables.

Coursework

EXAMPLES CLASSES
Differentiation - 4 hours
Integration - 5 hours
Assessed by 2 tests in conjunction with MA022

HOMEWORK
Calculus x 4

15 Indicative Reading List

Recommended Reading

Core Mathematics for Advanced Level, L. Bostock and S. Chandler, Nelson Thornes (Publishers) Ltd., ISBN 0 7487 55098.

16 Learning and Teaching Methods, including the nature and number of contact hours and the total study hours which will be expected of students, and how these relate to achievement of the intended learning outcomes

There will be 48 contact hours consisting of 36 hours of lectures, 9 hours of examples classes and 2

hours of tests. The examples classes will not be directly assessed, but will be assessed indirectly by the tests and the homework. The total student workload will be 150 hours.

17 Assessment methods and how these relate to testing achievement of the intended learning outcomes

Assessment for this module is by an end of year examination consisting of 90% of the value of the module. This will test the students' theoretical knowledge of the subject and their ability to make elementary calculations. The remaining 10% of the module will be allocated based on the test marks and homework.

18 Implications for learning resources, including staff, library, IT and space

There are no resource implications since this is a reduced version of a module already given.

19 We confirm that, as far as can be reasonably anticipated, the curriculum, learning and teaching methods and forms of assessment do not present any non-justifiable disadvantage to students with disabilities

Statement by the Director of Learning and Teaching:

"I confirm I have been consulted on the above module proposal and have given advice on the correct procedures and required content of module proposals"

....
Director of Learning/Teaching Date

.....
(Print name)

Statement by the Head of Department:

"I confirm that the Department has approved the introduction of the module and will be responsible for its resourcing"

....
Head of Department Date

.....
(Print name)