

Module title	
Maths and Programming (ELE00002C)	
Credit value	
20	
Module credit level	
Level 4	
Stream	
Digital & Electronics	
Module coordinator (if known) and department(s) involved in delivery of the module	
Dr John Szymanski Other teaching staff: Dr Steve Smith, Dr Atsufumi Hirohata, Dr Eugene Avrutin	
Indicative JACS subject code for the module	
H600 (Electronic Engineering)	
Teaching cycle	
Autumn Term. Annually taught.	
Pre-requisite modules/co-requisite modules/prohibited combinations	
A-level maths OR Maths Fundamentals (BSc Music Technology – Stage 1)	
Shared teaching	
BSc Stage 2 students take this module alongside B/MEng (Stage 1) students.	
Breakdown of the module workload	
Activity	Total hours
Lectures	54
Practicals	54
Workshops	9
Assessment	25
Private Study	58

Module aims
<ul style="list-style-type: none"> • To develop an understanding of the importance of mathematical tools for the modelling and analysis of engineering systems. • To develop familiarity and fluency in a range of fundamental areas (including basic algebra, complex numbers and calculus). • Introduce the concepts of software design and the techniques of computer programming. • Study an appropriate programming language to allow for the understanding of basic programming principles.
Module learning outcomes
<ul style="list-style-type: none"> • Display knowledge of a range of mathematical methods and be familiar with a number of basic formulae, relationships and their application. • Identify the appropriate mathematical tools required to solve a range of problems involving single-variable algebra and calculus. • Apply those methods, and carry out the associated calculations and manipulations required to work towards a solution. • Demonstrate the ability to design and implement simple programs • Test software solutions to practical problems against target specifications.
Further information about the module content
<p>Introduction to Computer Programming</p> <p>Overview of appropriate software design methodologies and the underlying principles of program operation. Introduce object oriented programming and simple user interface design using the Java programming language.</p> <p>Mathematics</p> <p>Mathematics for single-input and single-output systems: Interpreting data; graphs - normal, log-log, log-linear, polar and Bode; series expansions of exp, sin, cos and log; trigonometric relationships; combining two periodic signals; advanced properties of complex numbers - exponential form, De Moivre's theorem, roots of a complex number, rotations and phasors; methods and types of differentiation; applications of differentiation, including Taylor series expansion; fundamentals of integration; standard integrals and substitutions.</p>

Assessment	
Continuous Assessment	Please refer to the Statement of Assessment and the Assessment & Feedback Summary
Reassessment	Please refer to the Statement of Assessment
Feedback to students	
<p>Weekly workshops - Immediate feedback provided to problems raised by individual students.</p> <p>Assignments will be marked and returned within 4 weeks.</p> <p>Self assessment - complete worked examples incomplete examples for students to complete.</p>	
Reading List	
<p>Key to recommended books:</p> <p>** Strongly recommended for purchase (available from the University bookshop)</p> <p>* Recommended purchase</p> <p>++ Essential library reading</p> <p>+ Supportive library reading</p> <p>** Croft, A, Davison, R & Hargreaves, M, Flint, J. 'Engineering Mathematics', Prentice Hall, 2012 (4th Edition) ISBN-10: 0273719777, ISBN-13: 978-0273719779</p> <p>** Stroud, KA, 'Engineering Mathematics', 6th Edition, published by Palgrave Macmillan. ISBN 978-1403942463</p>	
Date on which the module template was last updated	4 th September 2012
Date approved by BoS	3 rd March 2010