MATH0032 An Introduction to Mathematica

Year:	2024-2025
Code:	MATH0032
Level:	6 (UG)
Normal student group (s)	UG: Year 3 Maths degrees
Value:	15 credits (= 7.5 ECTS credits)
Term:	1
Assessment:	4 or 5 computer tests
Normal Pre-requisites:	Some programming knowledge is desirable
Lecturer:	Dr JA Haight

Course Description and Objectives

The Mathematica system is a high-level computing environment including computer algebra, graphics and programming. At the basic level, it can be used as a scientific calculator; at more advanced levels, it incorporates all the features of classical programming languages such as PASCAL, LISP, MIRANDA, C, etc. It is particularly suitable for Mathematics, as it incorporates symbolic manipulation and automates many mathematical operations.

The aim of this course is to give all students a basic competence in its use, while encouraging more talented students to explore some of its advanced features.

Detailed Syllabus

Basic Mathematica use. Different styles of programming, including functional programming and procedural programming. Applications to many areas including cryptography, geometry and bitcoin. This year we will include the use of Large Language Models.

At the time of writing, the models most relevant to this course are GPT-4/Wolfram and Claude 3. They can provide Mathematica code (or code snippets) when they are given suitable prompts. Does this mean that programming will become obsolete? I don't think it will be as simple as that: it looks as though the low level writing of code will be more or less replaced by the editing of code. In order to edit code effectively, you need to be able to program, which is what this course is about