TY Mathematics: Analytic and Synthetic Geometry

Subject: Computer Science
Module name: Introduction to Python
Number of periods: 12 - Two per week, over six weeks
Class teacher: Jim McElroy and Michael Friel

Aims and objectives:

Students will learn to:

1) Write and interpret code in the Python programming language.
2) Navigate and use a variety of online resources on programming in Python.
3) Work individually and collaboratively in groups at written quizzes, exercises, and projects.
4) Organise their own learning while completing a detailed schedule of assessments.

By the end of the module, students will have been introduced to the fundamentals of programming in the popular and freely available programming language Python. If asked the question, 'have you ever done any coding?', students will be able to answer that they have and that they have a familiarity with introductory concepts and methods in programming. This will allow students, should they so desire, to further their own learning in Python or other programming languages, in their own time.

Course content:

Students will be introduced to the following areas of study:

Lesson 1: Using Codecademy and syntax in Python

Lesson 2: Strings in Python and console output

Lesson 3: if/elif/else statements in Python

Lesson 4: Functions in Python

Lesson 5: Using lists and dictionaries in Python

Lesson 6: Project 1, w3schools online Python compiler, and Thonny Python IDE

Lesson 7: More lists and functions in Python

Lesson 8: Loops in Python

Lesson 9: Classes and some advanced topics in Python

Lesson 10: Review lesson and Project 2

Lesson 11: Student feedback and Project 2

Lesson 12: Review of student feedback and Project 2

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Prior knowledge:

No prior knowledge of programming is required.

The module will be taught at a common level. Classwork tasks, written quizzes, exercises, and projects will be graded from easy to medium to more difficult, to reflect this.

Materials:

In completing this module, students will actively write and run code, using the computers located in the Upstairs Computer Lab. Students will also complete homework, further learning and projects using a home computer with internet connection.

Use of freely available online resources (Codecademy, Thonny, w3schools) and of MS Teams will be made throughout the module. Access at home to an internet-connected computer will be required.

All online resources used within the module are available for free. In particular, students will make extensive use of the freely available course on Codecademy, 'Learn Python 2'.

Digital learning skills:

To help develop student proficiency when it comes to the use of digital technologies in education, this module will incorporate the following:

- Online teacher-made resources covering key concepts, skills and demonstrations on MS Teams: This will allow students review course content in their own time or catch up on any material missed due to absence from class.
- Use of freely available online resources (Codecademy, Thonny, w3schools): Students will develop proficiency in writing and running Python code using a variety of freely available online resources.
- Projects: Two projects will be completed by students in assessment during this module. Students will be required to write, run and submit suitable code that successfully completes a variety of graded tasks.

Method of assessment:

Mode	Classwork	Homework MCQs	Project 1	Project 2
When	Every lesson	Most lessons	Lesson 6	Lesson 10+
Weighting	10%	20%	30%	40%

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