**Python Programming Foundation**

**Overview**

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| Level | 1 (Semester 1) |
| Duration | 4 weeks |
| Lectures | 2x40 minutes/week for 2 weeks |
| Practicals/tutorials | 5x2 hours/week for 3 weeks |

**Learning Outcomes**

* An understanding of how to write and run programs.
* An understanding of how computer programs should be structured.
* An understanding of, and ability to apply, techniques to support correct code.
* The ability to analyse simple problems, and solve them with programs.
* Knowledge and understanding of further, basic programming concepts and their application: scope, functions, recursion, modular programming, importing and invoking code from within other code.
* Knowledge and understanding of floating-point numbers, libraries for scientific computing, and their application.
* Skill in programming using the concepts above, in particular for solving problems.

**Syllabus**

This course will be delivered in two halves. The first will provide a self-contained introduction to computer programming. It assumes no prior knowledge of computers or programming. It will cover the basic principles of computer programming consisting of topics such as the following:

* How to write and run your first program
* Built-in types of data
* Fundamental programming concepts including variables and scope, conditional statements, and iteration.
* Arrays
* Programs that take inputs, and that generate outputs
* How to structure and debug code.

The second half will build on the first. It is particularly designed to be of use to those studying Science and Engineering subjects, broadly interpreted, as well as Computing Science and IT specialists. The second half of the course will, for example, provide:

* Knowledge and understanding of further basic programming concepts: scope, functions, recursion, modular programming, importing and invoking code from within other code.
* Knowledge and understanding of floating-point numbers, and libraries for scientific computing.
* Skill in deploying the above concepts in practice.

There will be weekly practical sessions and exercises to work with the concepts.