# **LIN6209 Coding for Linguists**

**Convenor:** Peter McGinty – [p.mcginty@qmul.ac.uk](mailto:p.mcginty@qmul.ac.uk)

**Office hours:** Fridays 15:00-16:30. Zoom ID: 893 0185 7833, passcode: LIN6209

**Class time and place**: Fridays, 10:00-12:00 Queens’ Building PC lab QM-212

**QM+ URL:** <https://qmplus.qmul.ac.uk/course/view.php?id=18362>

## **Module description**

This module introduces computer programming and computational modelling for applications in linguistics. There will be a strong focus on developing practical skills.

Students will learn how to write code in Python3 and gain experience in using tools that are suited to solving a range of computational problems in linguistics.

**Learning outcomes:** On completion of this module students will be ready to:

* Design and write programs in Python 3
* Use the Python standard libraries
* Understand what values, variables, objects, and functions are and know how to create and use them
* Programmatically read, process, and write, text and data files
* Analyse text and report on its statistical properties
* Search for patterns in texts using regular expressions
* Present results attractively in graphs and charts
* Understand the statistical techniques used in machine learning

Students will also have:

* An understanding of the iterative ‘requirements-analysis-design-build-test-evaluate’ software development process
* An awareness of recent advances in computer science relevant to linguistics

## **Module approach**

The best way to learn any programming language is to do lots of practice. You will therefore do lots of practical exercises. Expect one each week.

Active participation in class and in our QMPlus Forum is encouraged.

## **Readings and other learning resources**

There are no set books for this module. All the material required is available free on the web. I will post the material for each week’s lesson on QM+.

There are many good books and online resources for learning Python 3. A few I can recommend are:

* *Learn Python in One Day and Learn It Well*. 2017 (2nd ed). J. Chan. LCF Publishing.
* *Practical Programming: An Introduction to Computer Science Using Python 3*. 2013 (2nd ed.). P. Gries, J. Campbell, J. Montojo. Dallas and Raleigh: The Pragmatic Bookshelf.
* *Python Basics. A Practical Introduction to Python 3.* 2021 (4th ed.). The RealPython.com Tutorial Team. Real Python. [www.realpython.com](http://www.realpython.com)
* *Think Python: How to Think Like a Computer Scientist*. 2016 (2nd ed.) A. B. Downey. Download free at <https://greenteapress.com/wp/think-python-2e/>
* [www.w3schools.com/python/](http://www.w3schools.com/python/)
* [realpython.com](http://www.realpython.com)
* [www.freecodecamp.org/learn/](http://www.freecodecamp.org/learn/)
* [snakify.org/en/](https://snakify.org/en/)

## **Coursework assignments and deadlines**

You will be assessed on 5 assignments (50%) and one project (%50).

All work must be submitted electronically on QMplus. See the SLLF Student Handbook for information on late penalties and EC claims.

**Lecture and Assignment Schedule**

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| **Week** | **Topics** |
| **1** | Getting started with Python using interactive Python and IDLE.  Saving and re-using your programs.  Values, variables, functions, operators, input, and output. |
| **2\*** | Functions: designing, writing, testing, using, and re-using.  Testing. |
| **3\*** | Conditional execution. Boolean Logic.  Using an IDE (Integrated Development Environment): Spyder, PyCharm |
| **4\*** | Collections. Iterative and recursive execution. |
| **5\*** | CRUD: Creating, Reading, Updating and Deleting files. |
| **6\*** | Defining your project  IDE’s, Pandas, Numpy and Jupyter notebooks.  Charting and presenting data with Matplotlib and Seaborn  Regression and Cluster analysis for machine learning |
| ***7*** | *Reading week* |
| **8** | The iterative application development lifecycle  Testing and test-driven development  Managing errors and exceptions.  Project workshop |
| **9** | Data, databases, and SQL. |
| **10** | Projects: mid-point reviews and guidance. |
| **11** | Regular Expressions. |
| **12** | Python Futures  More software libraries: ANTLR, ST, NLTK, ...  Other programming languages, big data, artificial intelligence, chatbots and current trends. |