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Workshop I: Python Fundamentals

For students with limited programming experience, or for those needing to structure and consolidate their knowledge and skills, we have developed our **Python Fundamentals** module. This provides a paced, thorough introduction to the principles of **object-oriented programming, syntax** and **algorithmic thinking**.

Starting from the very basics, this course covers **essential programming concepts** including **input/output operations, variables, data types, lists, dictionaries, iterations, functions** and **error handling**. Students will learn to write clean, **readable code** while developing **problem-solving skills** through hands-on exercises and practical examples. By the end of this module, students will be comfortable using and understanding Python syntax and will have gained the confidence needed to tackle more advanced topics in future modules.

Python Fundamentals

Python Fundamentals Workshop

26/11/25 Python Fundamentals Workshop: Programming in Python and Algorithmic Thinking

Online Materials and Optional Assessment

27/11/25 Online Materials: Self-Study Materials and Optional Assessment Release

08/12/25 Optional Assessment Submission Deadline*

*You will receive your graded assignment and in-line feedback within 14 days of a timely submission.

Bespoke course for:

AIBIO UK

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Workshop II: Data Handling

Our **Data Handling** module introduces and extensively **explores Pandas DataFrames and NumPy arrays**: two core data structures for data science applications in Python. These packages facilitate the import, visualisation, analysis and manipulation of data, with this module introducing both univariate and multivariate analyses for exploring relationships within, and better understanding, your data. We navigate handling a **range of different data types, including numeric, tabular, time series and image data**, while learning essential data cleaning and transformation skills; with an end-goal emphasis on preparing your data for machine learning.

The module also explores **popular visualisation packages in Python, such as Matplotlib, Seaborn and Plotly**, demonstrating how to create publication-ready figures and diagrams, with precision and ease. We show you how to create compelling visuals from your data, helping to reveal patterns and uncover insights, taking you all the way **from basic plots through to more sophisticated visualisations and graphics.**

Data Handling

Data Handling Workshop

10/12/25	Data Handling Workshop:	Handling, Manipulating, and Working with Tabular and Image Data in Python

Online Materials and Optional Assessment

11/12/25	Online Materials:	Self-Study Materials and Optional Assessment Release
19/01/26	Optional Assessment Submission Deadline*	

*You will receive your graded assignment and in-line feedback within 14 days of a timely submission.

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Workshop III: Machine Learning

The **Machine Learning** module provides an in-depth look at **classical machine learning** methods, providing a solid introduction to the core concepts underpinning modern predictive techniques. These lessons will connect many of the concepts covered in the Data Handling module, demonstrating how data is prepared and optimised for machine learning. **Students will learn to implement a range of classification algorithms, and will refine, measure and interpret their output for optimal results.** The course primarily implements these techniques using the popular and industry standard **scikit-learn** package for Python.

Our classical machine learning lessons also uncover and explore the differences and theories behind the most popular algorithms, conveying when it is most appropriate to use them and what insights each can provide into your data. This module covers both **supervised** and **unsupervised learning** methods: namely the **classification** and **clustering** of different biological datasets, including images.

Machine Learning

Machine Learning Workshop

21/01/26	Machine Learning Workshop:	Supervised and Unsupervised Machine Learning in Python

Online Materials and Optional Assessment

22/01/26	Online Materials:	Self-Study Materials and Optional Assessment Release
16/02/26	Optional Assessment Submission Deadline*	

*You will receive your graded assignment and in-line feedback within 14 days of a timely submission.

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Workshop IV: Artificial Intelligence

Our **Artificial Intelligence** (AI) module delves even deeper, building upon the techniques taught in machine learning to **explore Artificial Intelligence and Deep Learning methods** and techniques. This broad topic covers three primary AI approaches: **Multi-Layer Perceptrons** (MLPs), **Convolutional Neural Networks** (CNNs), and **Generative AI (Large Language Models)**. Neural networks are introduced in our MLP lesson, with CNNs demonstrated as powerful tools for **image recognition** and analysis. Generative AI and its integration into the handling of scientific data are explored in the final lesson of this module, with a view to upscaling the power of biological workflows and analyses.

The course examines the concepts underpinning these tools, teaching students how to implement them using **PyTorch** – an industry-standard Python framework for building deep learning models. Additionally, we **explore how to better interpret the output of deep learning models**, despite their 'black box' nature, with the goal of gaining insight into the patterns these models identify in data.

Artificial Intelligence

Artificial Intelligence Workshop

18/02/26 Artificial Intelligence Workshop: Deep Learning, CNNs and Large Language Models

Online Materials and Optional Assessment

19/02/26 Online Materials: Self-Study Materials and Optional Assessment Release*

20/02/26 Final Project Release: Final Project Commences**

*You will receive your graded assignment and in-line feedback within 14 days of a timely submission.
**The final project is compulsory to receiving your Certification of Completion. Submission deadline within 30 days of this date.

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AI