



**Training in Data Science &  
Machine Learning  
for Health, Disease, and  
Bioscience**

Interested?

**Find us at:** [learntodiscover.ai](https://learntodiscover.ai)





Learn To Discover



# COURSE OVERVIEW

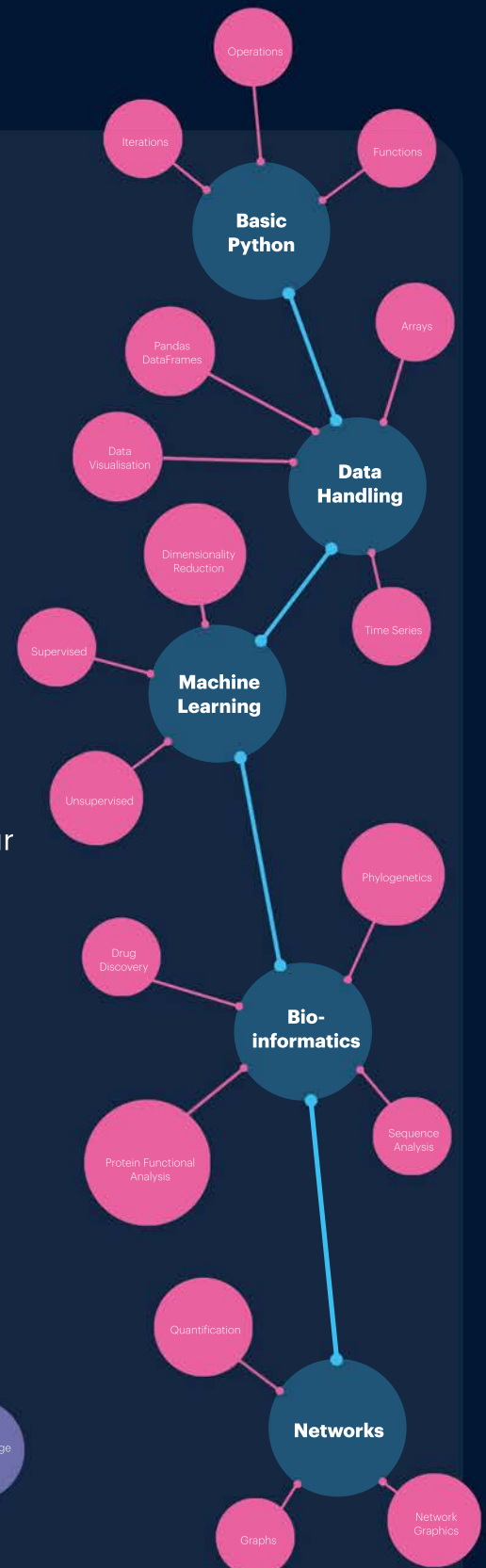
## About L2D

Learn to Discover (L2D) is a cutting-edge course targeted at bioscience and medicine professionals, empowering researchers with vital skills in **Python programming, data science** and **machine learning**.

Carefully developed by expert life scientists, L2D operates *via* a fortnightly programme of learning, delivering a rich curriculum supported by **live lectures**, interactive **drop-in sessions** and extensive **written and video lesson materials**.

Students are provided with multiple lines of support while studying with L2D: from **discussion forums** through to guided **one-to-one support sessions** with our L2D tutors, providing help and learning that is tailored to each individual, as per their requirements.

Learner progress is assessed and monitored regularly in the form of graded **assignments** and a **Final Project**, the sum of which result in the award of a **Certificate of Completion** and CPD credits.





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# COURSE CONTENT

## Part I: Basic Python & Data Handling

For students with limited programming experience, L2D offers four in-depth **Basic Python** lessons, that provide a paced and thorough introduction to the principles and syntaxes fundamental to programming in Python. These lessons place particular emphasis on the functions, methods and structures built into Python that are required for handling and processing data.

Following on from this, L2D offers a further four **Data Handling** lessons, introducing and exploring Pandas dataframes and NumPy arrays. Using these, learners understand how to import, visualise and handle data using Data Science-specific packages and functions, implementing both univariate and multivariate techniques. These lessons also explore the graphical visualisation of datasets using Matplotlib, while learning how to precisely control, analyse and interpret its output.

### Basic Python

Unit 1	Basic Python 1	Getting started, Input-Output, Operations
Unit 2	Basic Python 2	Arrays, Lists, Tuples, Strings
Unit 3	Basic Python 3	Iterations: For and While Loops
Unit 4	Basic Python 4	Dictionaries and Functions

### Data Handling

Unit 5	Dataframes 1	Import, Basic Stats, Visualisation
Unit 6	Dataframes 2	Scatter Plots, Correlations, Multivariate Analysis
Unit 7	Image Handling	Image Handling and Processing
Unit 8	Time Series	Plots, Filtering, Fourier Transform



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# COURSE CONTENT

## Part II: Machine Learning

The second major arm of the L2D course is aimed at students who wish to enter or resume the course at a more advanced level. If learners have enrolled in the **Complete L2D Course**, these lessons segue naturally from our **Basic Python** and **Data Handling** modules. For those wishing to start their L2D journey at this point, an equivalent proficiency in Python and its application in handling and analysing data, are expected.

L2D's **Machine Learning** lessons explore advanced data handling, **supervised** and **unsupervised machine learning**. Students will implement a variety of classification algorithms from the Scikit-learn library, and learn how to test and improve model performance and robustness. The course also explores what makes each particular model successful, and the insights these observations can give about our test data. The unsupervised learning lessons build and develop on these concepts, thoroughly exploring clustering and dimensionality reduction.

### Supervised Machine Learning

Unit 9	Machine Learning 1	Classification I: Introduction
Unit 10	Machine Learning 2	Classification II: Improvement
Unit 11	Machine Learning 3	Classification III: Refinement

### Unsupervised Machine Learning

Unit 12	Machine Learning 4	Clustering I: Gaussian Mixed Models
Unit 13	Machine Learning 5	Clustering II: Image Clustering
Unit 14	Machine Learning 6	Dimensionality Reduction: PCA
Unit 15	Final Project	



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## COURSES & MODULES

Choose from: our award-winning Complete L2D Course:



**COMPLETE**

£1000 + VAT

Or tailor your learning to suit your requirements, via one of our module bundles:



**BASIC PYTHON +  
DATA HANDLING**

£600 + VAT



**MACHINE  
LEARNING**

£500 + VAT



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## FAQs

### **Are there any prerequisites to taking L2D?**

To comfortably enrol in the L2D course, it is recommended that you have a very basic level of proficiency in using a personal computer: and a basic proficiency in using the operating system of your choosing (either Windows, Linux or Mac OS). You will also need a suitable computer of your own and access to a broadband internet connection.

### **What is the pace of this course?**

Each year, we run two L2D course cohorts, both of which centre around fortnightly lesson release calendars. We release one lesson topic every fortnight, and during this 14-day period, we give one online live lecture, and release lesson materials for self-study. Learners are given this full 14-day period to go through the materials at their preferred pace, and complete the lesson assignment, which is to be submitted before the release of the next lesson topic.

### **Is the course suitable for beginners and programming novices?**

Yes. Our Basic Python course – in its earliest modules – takes learners through the basics of setting up Python, and the most basic programming operations and functions. For those individuals who have either not programmed before, or who have limited programming experience, we recommend that you enrol in L2D from the Basic Python stage. Please contact [admin@learntodiscover.ai](mailto:admin@learntodiscover.ai) for more information on the optimal point at which to join the course.



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## FAQs

### **Is the course suitable for individuals who are already experienced in Python programming?**

Yes. For those individuals who have extensive Python programming experience, we recommend they take modules onwards of our Data Handling units: a prerequisite of this and all subsequent modules on our course, is a basic proficiency in the Python programming language. For learners who have this level of experience, we recommend joining from this stage, onwards. Please contact [admin@learntodiscover.ai](mailto:admin@learntodiscover.ai) to discuss this, and how to join at the appropriate stage of the course.

### **What is the workload of the L2D course like?**

In order to comfortably complete the L2D course, we recommend about 8 hours of self-study per lesson topic: this covers time for attending our live lectures, as well as self-study and completing assignments. Learners are also expected to submit an assignment at the end of each 14-day lesson period.

While we average the hours of study per topic to be roughly 8 hours in total, realistically, this varies slightly. Many learners find the Basic Python topics faster to complete, while the more complex Machine Learning topics may take individuals a longer period of time to finish, for example.

Once a learner has completed the final Machine Learning lessons, we assess their learning with a Final Project; completion of this is allocated a further 30 days, and tutor support is available throughout, should learners have any questions.

### **Do you offer any in-person teaching?**

We offer a limited number of in-person workshops throughout the year. Upon request, it is possible to book our L2D Academics to host a face-to-face, in-person workshop at a venue of your choosing. In terms of content and activities, these workshops typically offer tailored programmes of learning spread out over one or more days of teaching activities. If you are interested in attending or suggesting a future L2D workshop, please get in touch with us at [admin@learntodiscover.ai](mailto:admin@learntodiscover.ai).



**BASIC PYTHON  
PROGRAMMING**



**DATA  
HANDLING**



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