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Data Science Syllabus PDF

A data science syllabus usually runs through Python, SQL, statistics, data cleaning and visualisation, machine learning, model evaluation, an introduction to deep learning and text data, and a final project. Exact topics and order differ between institutes, so treat any syllabus as a checklist to compare, not a fixed standard.

Key takeaways

- Core modules are Python, SQL, statistics, data preparation, machine learning and a project.
- Advanced modules often include deep learning, natural language processing and deployment basics.
- Practical assignments matter as much as the topic list.
- Check the syllabus for tools used today, such as pandas and scikit-learn.
- Confirm the exact Uncodemy syllabus and duration on the course page before enrolling.

What is data science syllabus?

A data science syllabus is the structured list of topics, tools and practical work a learner covers, grouped into modules that build from programming and statistics towards machine learning and projects.

What modules does a typical syllabus include?

Syllabi vary, but a complete data science programme normally contains the modules below. Use the list to compare courses and to plan self-study.

Module	Main topics
1. Programming	Python syntax, functions, data structures, files, error handling
2. Data access	SQL queries, joins, aggregation, window functions
3. Maths and statistics	Descriptive statistics, probability, distributions, hypothesis tests
4. Data preparation	pandas, cleaning, missing values, encoding, scaling
5. Visualisation	Matplotlib, Seaborn, dashboards, storytelling
6. Machine learning	Regression, classification, trees, clustering, validation
7. Advanced topics	Neural networks, text data, time series
8. Deployment basics	Saving models, simple APIs, version control
9. Capstone	An end-to-end project with a written report

What is taught inside the programming and SQL modules?

Programming starts with variables, loops and functions, then moves to lists, dictionaries, classes and modules, then to NumPy and pandas. SQL covers filtering, grouping, joins, subqueries, common table expressions and window functions, since most real data lives in databases.

How deep should the statistics module go?

It should cover descriptive measures, probability rules, common distributions, sampling, confidence intervals, p-values, correlation and A/B testing. A learner should be able to explain each idea in words and apply it to a small dataset, not only recite formulas.

What does the machine learning module contain?

Typical topics are linear and logistic regression, decision trees, random forests, k-nearest neighbours, support vector machines, k-means, principal component analysis, cross-validation, hyperparameter search and common metrics. Good modules also teach feature engineering and error analysis, because these decide results more than the algorithm name does.

Are deep learning and generative AI included?

Many syllabi add an introduction to neural networks, convolutional networks for images, sequence models for text and now generative AI tools. Check how much is hands-on. A short overview is useful, but it does not replace the fundamentals in earlier modules.

What practical work should accompany the syllabus?

Look for weekly assignments, at least two mini-projects and a capstone with a written explanation. Ask whether you will work on messy data, use Git and present results. Practice is where most learning happens.

How should I compare two syllabi?

Check the tool versions, the ratio of practice to theory, the capstone requirements, how SQL and statistics are treated and whether doubt-solving is available. A longer list is not always better; coverage with depth is.

How long does each module usually take?

Durations vary by institute and by learner pace, so treat the following as a rough planning idea only. Programming and SQL often take the first several weeks, statistics and data preparation the next stretch, machine learning the longest stretch, and the capstone the final weeks. Learners with prior coding experience can move faster through the early modules, while newcomers may need extra practice. Ask any provider for the exact hours, batch timings and the number of practical sessions rather than relying on a general estimate.

What prerequisites make the syllabus easier to follow?

Basic school-level mathematics, comfort with logical thinking and willingness to write code every day are enough to begin. Familiarity with spreadsheets helps in the data preparation module, and a little probability helps in the statistics module. Nothing here needs advanced mathematics at the start; deeper topics such as linear algebra and optimisation are introduced when the machine learning modules need them. If any area feels weak, spend a week on it before the related module begins, so that later topics build on a firm base.

How can I track my own progress through the syllabus?

Turn each module into a checklist with three levels: understood, practised and used in a project. Tick a topic only when you can explain it without notes and have applied it to real data. Review the unchecked items every Sunday and plan the next week around them. This simple tracker keeps you honest about gaps and helps you decide when you are ready to start the capstone.

What questions should I ask a training provider about the syllabus?

Ask how many hours are live practice, whether recorded sessions are available, how projects are reviewed, which tool versions are used, how doubts are handled and what the capstone requires. Ask to see a sample assignment and the way progress is assessed. Written answers help you compare providers fairly and avoid surprises after enrolling.

Frequently asked questions

What topics are in a data science syllabus?

Common topics are Python, SQL, statistics, data cleaning, visualisation, machine learning, model evaluation, an introduction to deep learning and a capstone project.

Is the syllabus the same everywhere?

No. Institutes differ in depth, tools, order and duration, so compare practice hours, projects and tool versions rather than only the topic list.

Do I need to know programming before starting?

Not always. Many programmes begin with Python basics, though prior logic and maths comfort makes the early modules easier.

Does the syllabus include deep learning?

Many do, usually as an introduction to neural networks, images and text, after the core machine learning modules are complete.

Where can I confirm the Uncodemy syllabus?

Check the Data Science course page on the Uncodemy website or ask the counsellors, since modules and duration can change.

Sources and further reading

- Python documentation
- pandas documentation
- scikit-learn user guide

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