Department of Psychology, Stockholm University
Doctoral program in Psychology, spring semester 2026

Syllabus: Python Programming for Social Scientists (4.5 hp)

This course introduces practical programming skills for psychological and social-science research using the Python programming language. The course consists of six half-day workshops that combine short lectures with hands-on lab sessions. Participants learn to write Python code, work with standard scientific libraries, perform data handling and analysis, visualize results, build simple experiments, and use pretrained machine-learning models from the Hugging Face repository.

The course is designed for PhD students who want to incorporate computational tools into their research workflow, including data cleaning, exploratory analyses, visualization, statistical modeling, and experiment building.

Prior knowledge
No formal prerequisites. Basic familiarity with concepts such as variables, loops, conditional statements, and functions is recommended. Students without any programming background are advised to watch an introductory video course such as "Introduction to Programming and Computer Science – Full Course" by freeCodeCamp or similar material before the first workshop.

Learning outcomes
After successful completion of the course, students should be able to:
- Explain and apply fundamental Python syntax.
- Use core data structures and work with data frames using Pandas.
- Load, save, and preprocess data in common file formats.
- Create data visualizations using Matplotlib.
- Conduct basic data analysis using NumPy and SciPy.
- Describe and use basic object-oriented programming concepts.
- Apply pretrained AI/ML models obtained from the Hugging Face repository.

Course content
- Python fundamentals: syntax, variables, data types, control structures, functions, and standard libraries.
- Data handling with Pandas: data frames, I/O operations, transformations, and visualization.
- Numerical computing and statistical analysis using NumPy and SciPy.
- Introduction to object-oriented programming: classes, objects, methods, and core OOP principles.
- Building psychological experiments using PsychoPy (Builder and Coder interfaces).
- Using pretrained models from Hugging Face for text and data processing.

Activities
The course consists of six half-day workshops. Each session begins with a short lecture introducing key concepts, followed by a guided lab session where students work through exercises relevant to social-science research scenarios. Students are encouraged to bring a laptop with Python and necessary packages installed.

Attendance at all workshops is compulsory.

Examination
The course includes 5 take-home assignments. Each of them is graded with pass or fail. To pass the course, a pass is needed on all 5 assignments.

Forms of teaching
Teaching consists of short lectures, seminars, guided exercises, and laboratory-style practical work.

Literature
There is no mandatory textbook. Relevant documentation and online resources (Python, Pandas, NumPy, SciPy, Matplotlib, PsychoPy, and Hugging Face) will be provided during the course.

Schedule
The schedule below is preliminary. The final schedule, including information about location of the

workshop, will be provided in January 2026.

Date	Topic
Thu 19 Feb, 10:00 – 15:00	Python fundamentals: syntax, variables, data types, control structures, functions, and standard libraries.
Thu 26 Feb, 10:00 – 15:00	Data handling with Pandas: data frames, I/O operations, transformations, and visualization.
Thu 5 Mar, 10:00 – 15:00	Numerical computing and statistical analysis using NumPy and SciPy.
Thu 12 Mar, 10:00 – 15:00	Introduction to object-oriented programming: classes, objects, methods, and core OOP principles.
Thu 19 Mar, 10:00 – 15:00	Building psychological experiments using PsychoPy (Builder and Coder interfaces).
Thu 26 Mar, 10:00 – 15:00	Using pretrained models from Hugging Face for text and data processing.

Each workshop is formatted as follows:
10:00 – 12:00: lecture
12:00 – 13:00: lunch
13:00 – 15:00: demos & coding session

Course leader
Ronald van den Berg