

**Title of the course: Programming (Python) and Research Design**

**Credits: 3**

Type of the course: lecture/practical/exam

Type of the evaluation: exam/practical mark

Course requirements: writing Python scripts

Place in curriculum (semester): 1<sup>st</sup> or 2<sup>nd</sup> semester in MA

Prerequisites (*if any*): *none*

**Course description:** Please, provide a short, informative description of knowledge to obtain and competences to achieve, and a short summary of the aims and content of the course, followed by the topics covered.

Description:

The course introduces basic computer programming skills, using the Python language. Examples and applied aspects focus on topics that are crucial in cognitive science, including experimenting, data analysis and statistics, and cognitive simulations. Most relevant Python modules are also discussed. In many cases comparison of other languages are included, with a main focus on Matlab, another language widely used in cognitive science.

Aims:

At the end of the course one should be able to understand and modify experimenting and simple analysis scripts, and should be able to find appropriate documentation or online help to learn new techniques.

Main topics:

- Introduction to programming I. AlgoTaurus
- Introduction to programming II. Scratch software
- Basic components of computer programming language
  - Data types, constants and variables
  - Control flow: conditionals and loops
  - Functions
- Introduction to Python language
  - Optionally comparison with Matlab
  - Python specific features (rarely used in other languages): lists, dictionaries, list comprehension
- Experimenting
  - General features of experimenting software
  - Experimenting with OpenSesame and PsychoPy

3-5 most important required and suggested readings (eg. textbook) with bibliographic details (author, title, details of edition, pages, ISBN)

Required readings:

None

Suggested readings:

AlgoTaurus manual

<https://github.com/krajcsi/algotaurus>

Online Python tutorials and manuals.

e.g., <https://docs.python.org/2/>

Python manuals and forums for solving homework.

OpenSesame and/or PsychoPy tutorials and manuals.

e.g., <http://osdoc.cogsci.nl/tutorials/>

e.g., <http://www.psychopy.org/documentation.html>