**Introduction to Programming in Python**

**PSYCH 711/712**

**Instructor:** Joey Legere (legerejk@mcmaster.ca)

**Website:** brain.mcmaster.ca/joey/python/17/

**Office:** PC-426E

**Lectures:** Tuesdays, Thursdays, 1:00 – 3:00 PM, BSB 241

**Description**

The primary objective of this course is to introduce students to programming using the Python language, and give them the tools they need to analyze data and create cognitive experiments using Python. No prior experience with computer programming is necessary. Weeks 1 – 4 will serve as an introduction to the language, and students will complete weekly coding assignments for these weeks. Week 5 we will walk through constructing a basic experiment using the Psychopy coder.

There will be no assignments for weeks 5 and 6, rather, students will undertake a final project. This project can be selected from a list, but students are encouraged to think of their own projects to be approved by the instructor: ideas could be analyzing a complicated dataset, data munging, or creating a game or experiment.

Lectures will be interactive. Students are expected to bring their own laptops if possible, and write code along with the instructor during the lesson. Students without laptops may use the computers provided in the room.

Each lecture will also have at least one in-class exercise (worth bonus marks to be added to the final grade) to reinforce concepts as they come up. Students will be able to work together to solve these problems.

**Required Materials**

There is no required textbook for this course.

We will be using Jupyter notebooks for the majority of the course, with the exception of the Psychopy coding interface for the final week. Instructions for downloading Jupyter are available on the course website.

**Assessment**

- **Weekly Assignments** 60% (4 assignments, 15% each)
- **Final Project** 40% (Due June 8th)
- **Bonus Marks** 5% max (in-class exercises)

There are 4 weekly programming assignments, weighted at 15% each. Assignments will be graded on code functionality and clarity (it should work as intended, and be relatively easy to read). Assignments are due weekly and solutions will be taken up in class. The final project, which students will have the entire term to complete, is worth 40% of the final grade. This project may be proposed at any time, but students are encouraged to begin thinking about projects relevant to their own line of research early in order to receive instructor feedback.
**Tentative schedule**

**Week 1 (May 2nd, May 4th):** Fundamentals. Mathematical operations (+, -, /, *, exponentiation, and modulus), elementary data types. For loops and accumulators.  
**Objective:** Create and modify simple programs that produce meaningful output from user input (adding numbers, converting units).

**Week 2 (May 9th, May 11th):** Working with and converting between data types: integers, floats, strings, lists, and dictionaries. Modular arithmetic for counterbalancing.  
**Objective:** Be able to write code that maps subject/trial/block numbers to experimental conditions.

**Week 3 (May 16th, May 18th):** Control flow (loops, if statements, functions). Introduction to the standard library (randomization, timing).  
**Objective:** Write functions for more legible code. Create simple text-driven experiments and games.

**Week 4 (May 23rd, May 25th):** Reading and writing from files. Plotting data.  
**Objective:** Read in data from an external source, perform operations and save it. Summarize data in meaningful graphs.

**Week 5 (May 30th, June 1st):** Cognitive experiments in Psychopy.  
**Objective:** Be able to modify, or create cognitive tasks using the Psychopy coder.

**Week 6 (June 6th):** No formal lesson. Drop-in assistance with final projects.

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**Assigning of Grades**

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<tr>
<th>Numerical Grade</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>90 – 100</td>
<td>A+</td>
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<tr>
<td>85 – 89</td>
<td>A</td>
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<td>80 – 84</td>
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<tr>
<td>73 – 76</td>
<td>B</td>
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<tr>
<td>70 – 72</td>
<td>B-</td>
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<tr>
<td>0 – 69</td>
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**Note 1:** The penalty for assignments submitted after the due date is 10% per day late. Application of this penalty is at the discretion of the instructor.

**Note 2:** The instructor and university reserve the right to modify elements of the course during the term. The instructor and university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course website weekly during the term and to note any changes.

**Note 3:** Attention is drawn to the Statement on Academic Ethics and the Senate Resolutions on Academic Dishonesty as found in the Senate Policy Statements distributed at registration and available in the Senate Office. Any student who infringes one of these resolutions will be treated according to the published policy.