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| **Course title** | Introduction to Scientific Programming | | | | | |
| **Course code** | PSY205 | | | | | |
| **Course type** | Compulsory | | | | | |
| **Level** | Undergraduate | | | | | |
| **Year / Semester** | Year 2 / Semester 2 | | | | | |
| **Teacher’s name** | Christodoulos Efstathiades | | | | | |
| **ECTS** | 7.5 | **Lectures / week** | Continuous | **Laboratories / week** | | 1 |
| **Course purpose and objectives** | The purpose of this course is to provide psychology students the fundamental programming abilities and resources they need to undertake simulations, experiments, and data analysis more effectively and rigorously. This course intends to enable students to engage in sophisticated data manipulation, analysis, and visualization techniques, promoting a deeper understanding of psychological phenomena and boosting their research capacities. It does this by fusing programming knowledge with psychological research concepts. | | | | | |
| **Learning outcomes** | Students are expected to:   1. Show a grasp of basic programming ideas, such as variables, data types, loops, conditionals, and functions. 2. Use programming tools to import, purge, and preprocess psychological data. 3. Conduct fundamental to advanced statistical analyses on psychological data. 4. Create data visualizations to convey psychological insights clearly. 5. Discuss the ethical issues in programming for psychological research, including data privacy and biases.Top of Form | | | | | |
| **Prerequisites** | PSY202, PSY203 & PSY206 | | **Required** | | Yes | |
| **Course content** | Students should acquire the fundamental programming abilities and resources they need to undertake simulations, experiments, and data analysis more effectively and rigorously. Also, students should engage in sophisticated data manipulation, analysis, and visualization techniques, promoting a deeper understanding of psychological phenomena and boosting their research capacities. It does this by fusing programming knowledge with psychological research concepts.  Week 1: Introduction to Programming and Psychology Research  Week 2: Fundamentals of Programming  Week 3: Data Handling and Manipulation  Week 4: Programming & Statistical Analysis  Week 5: Data Visualization  Week 6: Experimental Simulations  Week 7: Algorithmic Thinking in Psychology  Week 8: Replicability and Open Science  Week 9: Advanced Techniques in Programming for Psychology  Week 10: Ethical Considerations in Programming for Psychology  Week 11: Project-based Learning  Week 12: Collaboration and Communication  Week 13: Critical Thinking and Problem Solving  Week 14: Final Projects and Showcase & Future Directions in Psychological Programming  Top of Form | | | | | |
| **Teaching methodology** | Lab-based | | | | | |
| **Bibliography** | Matthes, E. Python Crash Course, 3rd Edition: A Hands-On, Project-Based Introduction to Programming (3rd ed.). No Starch Press.  Github portal  Further material will be determined by the course leader.Top of Form | | | | | |
| **Assessment** | 1. Weekly assignments covering all programming areas taught per module (10 x 5 = 50%) 2. Final programming project (40%) 3. Presence and Participation (10%): Students should be present and actively participate in in-class discussions. | | | | | |
| **Language** | English | | | | | |