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| **Course title** | Neuroimaging Techniques | | | | | |
| **Course code** | PSY314 | | | | | |
| **Course type** | Elective | | | | | |
| **Level** | Undergraduate | | | | | |
| **Year / Semester** | Year 3 | | | | | |
| **Teacher’s name** | Maria Photiou | | | | | |
| **ECTS** | 7.5 | **Lectures / week** | 1 | **Laboratories / week** | | 0 |
| **Course purpose and objectives** | The purpose of this course is to provide students with a comprehensive understanding of the various neuroimaging techniques used in the field of psychology. This course aims to equip students with the theoretical knowledge and practical skills necessary to critically evaluate, utilize, and contribute to research involving neuroimaging methods. By the end of the course, students should be able to apply neuroimaging techniques to investigate brain structure and function, analyze neuroimaging data, and interpret the implications of findings for psychological theories and applications. | | | | | |
| **Learning outcomes** | The following learning outcomes are expected, where students will:   1. Understand the fundamental principles of various neuroimaging techniques, including MRI, fMRI, PET, SPECT, and EEG/MEG. 2. Explain the differences between structural and functional imaging modalities and their applications. 3. Analyze and interpret neuroimaging data, including activation patterns and connectivity networks. 4. Discuss ethical considerations in neuroimaging research involving human participants. 5. Communicate neuroimaging findings clearly to both expert and non-expert audiences. | | | | | |
| **Prerequisites** | PSY202, PSY207 & PSY209 | | **Required** | | No | |
| **Course content** | This course aims to equip students with the theoretical knowledge and practical skills necessary to critically evaluate, utilize, and contribute to research involving neuroimaging methods. By the end of the course, students should be able to apply neuroimaging techniques to investigate brain structure and function, analyze neuroimaging data, and interpret the implications of findings for psychological theories and applications.  Week 1: Introduction to Neuroimaging Techniques  Week 2: Neuroimaging Technology and Data Acquisition  Week 3: Preprocessing and Data Analysis  Week 4: Structural and Functional Neuroimaging  Week 5: Advanced Analysis Techniques  Week 6: Linking Neuroimaging and Psychology  Week 7: Ethical Considerations and Responsible Research  Week 8: Research Design and Methodology  Week 9: Data Interpretation and Communication  Week 10: Emerging Trends and Future Directions  Week 11: Practical Labs and Hands-on Experience  Week 12: Final Projects and Presentations | | | | | |
| **Teaching methodology** | Lecture | | | | | |
| **Bibliography** | The latest peer-reviewed journal articles, reviews, and reputable online resources will be distributed by the lecturer throughout the course. | | | | | |
| **Assessment** | 1. Midterm & Final Exam (30% & 30%): Mid-term and final exams will be conducted covering the entire course. Both exams will include multiple-choice, short-answer, and essay questions. 2. Group assignment and presentation (20%): Assign group project where students integrate theoretical knowledge, practical skills, and critical analysis to address a complex neuroimaging question. 3. Individual assignments (10%): Hands-on assignments that involve preprocessing and analyzing neuroimaging data using software tools. Assignments will include tasks such as image registration, normalization, activation analysis, and connectivity analysis. 4. Presence & Participation (10%): Students should be present and actively participate in in-class discussions. | | | | | |
| **Language** | English | | | | | |