



### EXPERIMENTAL CLINICAL NEUROSCIENCE

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| <b>Enrollment year</b>     | 2022/2023   |
| <b>Academic year</b>       | 2023/2024   |
| <b>Regulations</b>         | DM270   |
| <b>Academic discipline</b> | M-PSI/08 (CLINICAL PSYCHOLOGY)  |
| <b>Department</b>          | DEPARTMENT OF BRAIN AND BEHAVIORAL SCIENCES   |
| <b>Course</b>              | PSYCHOLOGY, NEUROSCIENCE AND HUMAN SCIENCES   |
| <b>Curriculum</b>          | Cognitive Psychology and Neuroscience   |
| <b>Year of study</b>       | 2°  |
| <b>Period</b>              | 2nd semester (12/02/2024 - 31/05/2024)  |
| <b>ECTS</b>                | 6   |
| <b>Lesson hours</b>        | 36 lesson hours   |
| <b>Language</b>            | English   |
| <b>Activity type</b>       | WRITTEN AND ORAL TEST   |
| <b>Teacher</b>             | BARELLO SERENA (titolare) - 0 ECTS<br>BARELLO SERENA (titolare) - 6 ECTS  |
| <b>Prerequisites</b>       | The course prerequisites include a basic knowledge of research methods and neuroscience.  |
| <b>Learning outcomes</b>   | <p>This course aims at developing knowledge and understanding in several key areas of Experimental Clinical Neuroscience:</p> <ul style="list-style-type: none"><li>a) Advanced comprehension of theoretical models and the interpretation of experimental data with reference to Experimental Clinical Neuroscience</li><li>b) Profound understanding of the methods and research techniques employed within the field of Experimental Clinical Neuroscience</li><li>c) Ethical and deontological awareness necessary for conducting research procedures in the area of Experimental Clinical Neuroscience responsibly.</li></ul> <p>Furthermore, the course aims to cultivate the ability to apply this knowledge and understanding effectively by:</p> |

- a) enhancing proficiency in executing and assessing applications within experimental contexts in the area of Experimental Clinical Neuroscience
- b) advancing students' competences in executing and evaluating applications within clinical environments in the area of Experimental Clinical Neuroscience
- c) promoting critical thinking, analytical prowess, and the synthesis of ideas in the area of Experimental Clinical Neuroscience
- d) using ethical principles in practical applications and research endeavors in Experimental Clinical Neuroscience

#### Course contents

##### Module 1: Introduction to Experimental Clinical Neuroscience

- Definition and scope of Experimental Clinical Neuroscience
- Understanding the intersection of neuroscience, clinical psychology, and human sciences

##### Module 2: Basic concepts of Research Methodology in Clinical Neuroscience

- Research design and hypothesis formulation
- Experimental vs. non-experimental research approaches
- Introduction to quantitative and qualitative data collection methods

##### Module 4: Experimental Designs in Clinical Neuroscience

- Understanding different experimental designs (randomized control trials, crossover designs, etc.)
- Pros and cons of various experimental designs in neuroscience research

##### Module 5: Patient-Reported and Provider-Reported Outcomes in Neuroscience

- Definition and significance of Patient-Reported Outcomes (PROs) and Provider-Reported Outcomes (PREMs)
- Integrating PROs and PREMs in research methodologies
- Analyzing and interpreting PRO and PREM data
- Case studies of successful application of PROMS/PREMS in neuroscience

##### Module 6: Translational Research: Applying Experimental Findings to Clinical Practice

- Bridging the gap between experimental research and clinical application
- Challenges and opportunities in translating research findings to patient care
- Case studies of successful translational research in neuroscience

##### Module 7: Qualitative Research Methods in Clinical Neuroscience

- Introduction to qualitative research methodologies (interviews, focus groups, etc.)
- Applications of qualitative methods in understanding patient experiences and perspectives
- Experiencing qualitative data collection methods
- Case studies of successful application of qualitative research in neuroscience

##### Module 8: Quantitative Research Methods in Clinical Neuroscience

- Introduction to quantitative research methodologies (survey)
- Applications of survey research in understanding patient experiences and perspectives
- Experiencing survey design
- Case studies of successful application of survey research in

neuroscience

Module 9: Ethical Issues in Experimental Clinical Neuroscience

- Informed consent and participant rights in neuroscience research
- Balancing research goals with patient welfare
- Neuroethics and the future of ethical considerations in neuroscience

#### Teaching methods

The course is intentionally designed to be highly interactive and practical, employing a diverse range of didactic strategies to optimize the learning experience:

- Blended Learning Approach: The course will adopt a blended learning approach, combining traditional lectures with interactive and experiential learning activities.
- Lecture Sessions: Traditional lectures will provide foundational knowledge on experimental clinical neuroscience concepts, research methodologies, and theoretical frameworks.
- Group Discussions: Engage students in group discussions to foster critical thinking and deeper understanding of course topics. Encourage active participation and knowledge sharing among peers.
- Case-Based Analyses: Present real-life clinical cases related to neuroscience research for students to analyze and apply their knowledge to practical scenarios.
- Research Proposal Development: Guide students in developing a research proposal to reinforce their understanding of research design and methodologies.
- Practical Skills Workshops: Conduct hands-on workshops to develop practical skills, such as designing and conducting qualitative and quantitative data collection procedures.
- Guest Lectures: Invite experts and practitioners in the field of experimental clinical neuroscience to deliver guest lectures, providing insights into real-world applications.
- Online Learning Platforms: Utilize online platforms for interactive discussions, sharing resources, and accessing course materials and supplementary resources.
- Formative Assessment: Provide formative assessments, such as peer reviews and feedback on assignments, to support continuous learning and improvement.

#### Recommened or required readings

Throughout the present course, students will be provided with an extensive range of study materials, which includes course slides and carefully selected research articles. The course slides offer a well-structured overview of each session's topics, presenting key concepts, theories, and practical illustrations. They serve as valuable reference materials, enabling students to reinforce their understanding and review the content beyond the classroom, facilitating their preparation for the final exam. Additionally, students will have access to research articles from reputable journals, thoughtfully curated to complement the course content and offer in-depth insights into specific areas of clinical research methods applied to neuroscience.

#### Assessment methods

Written exam that covers the core concepts discussed throughout the course. The exam will include multiple-choice questions, short-answer questions, and essay questions to assess students' understanding of

the material.

#### Further information

Prof. Serena Barello is available to meet students by appointment. Interested students can write to [serena.barello@unipv.it](mailto:serena.barello@unipv.it), setting "ExCliNeuro appointment" as the subject of the e-mail

#### Sustainable development goals - Agenda 2030

This course is closely linked to several Sustainable Development Goals (SDGs) outlined by the United Nations in their 2030 Agenda for Sustainable Development. Here are some of the connections:

**SDG 3: Good Health and Well-being** The course directly contributes to SDG 3 by focusing on neuroscience research that enhances understanding of the human brain, its disorders, and potential treatments. By equipping students with knowledge and skills in clinical neuroscience, the course supports efforts to improve mental health, diagnose neurological disorders, and develop effective interventions to promote well-being.

**SDG 4: Quality Education** The course aligns with SDG 4 by providing quality education to psychology master students in the area of Experimental Clinical Neuroscience. By imparting research methodologies, data analysis techniques, and ethical considerations, the course prepares students to be knowledgeable and competent researchers in the field.

**SDG 9: Industry, Innovation, and Infrastructure** Through its emphasis on cutting-edge research methodologies, the course contributes to SDG 9 by promoting innovation and advancements in the field of neuroscience. By equipping students with knowledge about the latest research tools and techniques, the course fosters progress in neuroscience research and its application to clinical practice.

**SDG 10: Reduced Inequalities** The course supports SDG 10 by promoting inclusivity and reducing inequalities in healthcare. By exploring the role of PROs and PREMs, as well as qualitative research methods, students learn to consider patient experiences and perspectives, contributing to more patient-centered and equitable healthcare practices.

**SDG 17: Partnerships for the Goals** The course encourages interdisciplinary collaboration between neuroscience researchers, clinicians, and healthcare professionals, aligning with SDG 17. By fostering partnerships and shared knowledge, the course aims to bridge the gap between experimental findings and their translation into clinical practice, ultimately enhancing patient care and outcomes.

Overall, this course aims to contribute to advancing scientific knowledge in neuroscience and clinical psychology while addressing specific SDGs related to health, education, innovation, inclusivity, and partnerships. By preparing students to contribute to neuroscience research and clinical practice, the course directly supports the United Nations' broader goals outlined in the SDGs 2030 Agenda.

