

Syllabus Advanced quantitative methods in population mental health

≠ 240	Advanced quantitative methods in population mental health
Coordinator	Dr Michael MIREKU
Dates	January 19 to 23 2026
ECTS	3 ECTS
Duration	5 days of 6 hours = 30 hours
Location	Room: XX, EHESP Rennes
Description	
Prerequisites	Advanced module EPI 203 and Biostats 204
Competences	<p>At the end of the module, the students should be able to:</p> <ol style="list-style-type: none"> 1. Explain key steps and methods in developing and validating mental health scales. 2. Describe core structural equation modelling (SEM) principles with a focus on mediation in population mental health. 3. Apply SEM techniques to specify and interpret mediation models. 4. Measure biological ageing using OMICs data. 5. Understand the link between psychiatric disorders and biological ageing. 6. Understand the fundamentals of genome-wide association studies (GWAS) and how to calculate polygenic scores.
Course learning objectives	<ul style="list-style-type: none"> - Ability to develop a comprehensive understanding of how mental health measurement scales are designed, tested for validity and reliability, and refined for use in diverse population health contexts - Ability to conceptualise and test mediation models using SEM, enabling them to explore indirect effects and latent constructs relevant to population mental health research - Ability to apply advanced statistical software to model mental health processes and interpret real-world data - Ability to evaluate how biological ageing can be estimated from OMICs-based molecular data and its application in psychiatric epidemiology - Awareness of the fundamentals of genome-wide association studies (GWAS) and the construction and interpretation of polygenic scores (PGS) in relation to psychiatric disorders - Ability to design and evaluate various models to explore the complexity of biopsychosocial determinants of mental health <p>Teaching activities: Lectures and interactive discussions with lecturers and experts, in class exercise using data.</p> <p>Evaluation: Group assignment (30%) and an individual examination (multiple choice and short questions) at the conclusion of the course (70%).</p>
Structure	<u>Details of the sessions:</u>

(details of sessions title/speaker/date/duration)	<p>Session 1- Development of psychometric assessments for mental health, M Mireku</p> <p>Session 2 – Introduction to structural equation modelling, M Mireku</p> <p>Session 3 – Applied mediation modelling in mental health research, M Mireku</p> <p>Session 4 – Population health and biological ageing, J Mutz</p> <p>Session 5 – Biological ageing and mental health, J Mutz</p> <p>Session 6 – Genome-wide association studies and polygenic scores, J Mutz</p> <p>Session 7 – Psychiatric genetics and biological ageing, J Mutz</p>
Resources	
Course requirements	
Grading and assessment	Group assignment (30%) and an individual examination (multiple choice and short questions) at the conclusion of the course (70%).
Course policy	<p>Attendance & punctuality</p> <p>Regular and punctual class attendance is a prerequisite for receiving credit in a course. Students are expected to attend each class. Attendance will be taken at each class. The obligations of attendance and punctuality cover every aspect of the course: - lectures, conferences, group projects, assessments, examinations, as described in EHESP Academic Regulations http://mph.ehesp.fr EHESP Academic Regulation Article. 3). If students are not able to make it to class, they are required to send an email to the instructor and to the MPH program coordinating team explaining their absence prior to the scheduled class date. All supporting documents are provided to the end-of-year panel.</p> <p>Students who miss class are responsible for content. Any student who misses a class has the responsibility for obtaining copies of notes, handouts and assignments. If additional assistance is still necessary, an appointment should be scheduled with the instructor. Class time is not to be used to go over material with students who have missed class.</p> <p>Lateness: Students who are more than 10 minutes late may be denied access to a class. Repeated late arrivals may be counted as absences (See http://mph.ehesp.fr EHESP Academic Regulation Article. 3 Attendance & Punctuality)</p> <p>Maximum absences authorized & penalty otherwise Above 20% of absences will be designated a fail for a given class. The students will be entitled to be reassessed in any failed component(s). If they undertake a reassessment or they retake a module this means that they cannot normally obtain more than the minimum pass mark (i.e. 10 out of 20)</p> <p>Exceptional circumstances Absence from any examination or test, or late submission of assignments due to illness, psychological problems, or exceptional personal reasons must be justified; otherwise, students will be penalized, as above mentioned. Students must directly notify their professor or the MPH academic secretariat before the exam or before the assignment deadline. Before accepting the student's justification, the professor or the MPH academic secretariat has the right to request either a certificate from the attending physician or from a psychologist, or from any other relevant person (See http://mph.ehesp.fr EHESP Academic Regulation Article 4 Examinations).</p> <p>Courtesy: <u>All cell phones/pages MUST be turned off during class time.</u> Students are required to conduct themselves according to professional standards, eating during class time is not permitted during class time, such as course or group work.</p>

Valuing diversity	Diversity enriches learning. It requires an atmosphere of inclusion and tolerance, which oftentimes challenges our own closely-held ideas, as well as our personal comfort zones. The results, however, create a sense of community and promote excellence in the learning environment. This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity. Diversity includes consideration of: (1) life experiences, including type, variety, uniqueness, duration, personal values, political viewpoints, and intensity; and (2) factors related to “diversity of presence,” including, among others, age, economic circumstances, ethnic identification, family educational attainment, disability, gender, geographic origin, maturity, race, religion, sexual orientation and social position.
Course evaluation	EHESP requests that you complete a course evaluation at the end of the school year. Your responses will be anonymous, with feedback provided in the aggregate. Open-ended comments will be shared with instructors, but not identified with individual students. Your participation in course evaluation is an expectation, since providing constructive feedback is a professional obligation. Feedback is critical, moreover, to improving the quality of our courses, as well as for instructor assessment.