

## SYLLABUS

### Quantitative research methods and data analysis II

University year 2025-2026

#### 1. Information regarding the programme

1.1. Higher education institution	Babeş-Bolyai University
1.2. Faculty	Faculty of Psychology and Educational Sciences
1.3. Department	Psychology
1.4. Field of study	Psychology – Cognitive sciences
1.5. Study cycle	Bachelor level
1.6. Study programme/Qualification	Psychology
1.7. Form of education	Full-time studies

#### 2. Information regarding the discipline

2.1. Name of the discipline	<b>Quantitative research methods and data analysis II</b>				Discipline code		
2.2. Course coordinator	Assoc. Prof. Sebastian Pinteá, PhD						
2.3. Seminar coordinator	Assoc. Prof. Sebastian Pinteá, PhD						
2.4. Year of study	I	2.5. Semester	II	2.6. Type of evaluation	E	2.7. Discipline regime	Mandatory

#### 3. Total estimated time (hours/semester of didactic activities)

3.1. Hours per week	<b>4</b>	of which: 3.2 course	<b>2</b>	3.3 seminar/laboratory	<b>2</b>
3.4. Total hours in the curriculum	56	of which: 3.5 course	28	3.6 seminar/laborator	<b>28</b>
<b>Time allotment for individual study (ID) and self-study activities (SA)</b>					<b>hours</b>
Learning using manual, course support, bibliography, course notes (SA)					30
Additional documentation (in libraries, on electronic platforms, field documentation)					24
Preparation for seminars/labs, homework, papers, portfolios and essays					10
Tutorship					6
Evaluations					2
Other activities:					0
<b>3.7. Total individual study hours</b>					<b>70</b>
<b>3.8. Total hours per semester</b>					<b>128</b>
<b>3.9. Number of ECTS credits</b>					<b>5</b>

#### 4. Prerequisites (if necessary)

4.1. curriculum	Basic knowledge of research methods in cognitive science/psychology (Quantitative research methods and data analysis I)
4.2. competencies	English language

#### 5. Conditions (if necessary)

5.1. for the course	<ul style="list-style-type: none"> <li>Classroom with at least 180 seats, computer and video projector / Online course conducted through the MS Teams platform.</li> </ul>
5.2. for the seminar /lab activities	Room with at least 50 seats, computer and video projector / Online seminar conducted through the MS Teams platform; computers with data analysis software Excel and JASP.

### 6.1. Specific competencies acquired <sup>1</sup>

<b>Professional/essential competencies</b>	<p><b>Knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>● Has good knowledge of different research designs, including their advantages and disadvantages.</li> <li>● Has good knowledge of the steps in designing an experimental study.</li> <li>● Understand the limitations imposed by the research goals and the practical conditions of a study on the way in which variables are being operationalized.</li> </ul> <p><b>Explanation and interpretation</b></p> <ul style="list-style-type: none"> <li>● Explains the advantages and disadvantages of main experimental research methods.</li> <li>● Explains correctly how the results of an experimental/quasi-experimental study should be interpreted.</li> <li>● Being able to interpret correctly the results of a multifactorial experimental design.</li> </ul> <p><b>Instrumental - applicative</b></p> <ul style="list-style-type: none"> <li>● Designing an experimental/quasi-experimental study by adequately defining the dependent and independent variables as reflected in the experimental manipulation.</li> <li>● Identifying possible confounding variables and interpreting the results in accordance with the alternative explanations based on the condition in which the study was conducted.</li> </ul> <p><b>Attitude</b></p> <ul style="list-style-type: none"> <li>● Expressed interest towards empirical research.</li> <li>● Promotes scientific rigor in designing a study, collecting the data, analysing the data and in writing the results.</li> </ul>
<b>Transversal competencies</b>	<ul style="list-style-type: none"> <li>● Being able to effectively work in small groups.</li> <li>● Being able to effectively use the available information and the resources including the references and the statistical software.</li> <li>● Expressing a responsible attitude towards the professional field and the importance of science.</li> <li>● Expressing a responsible attitude towards the ethical practices in scientific research.</li> </ul>

### 6.2. Learning outcomes

<b>Knowledge</b>	<p>The student is familiar with the main comparative statistical procedures (parametric and non-parametric tests);</p> <p>The student is familiar with the main experimental designs involving independent samples and repeated measures;</p> <p>The student is familiar with the main single-subject experimental designs;</p> <p>The student understands the basic principles of moderation and mediation.</p>
<b>Skills</b>	<p>The student is able to apply the main comparative statistical procedures (parametric and non-parametric tests) and correctly interpret the results;</p> <p>The student is capable of planning and implementing the main experimental designs involving independent samples and repeated measures;</p> <p>The student is capable of planning and implementing the main single-subject experimental designs;</p> <p>The student is capable of testing the moderating and mediating functions of variables.</p>
<b>Responsibility and autonomy:</b>	<p>The student has the ability to independently apply the main comparative statistical procedures (parametric and non-parametric tests) and correctly interpret the results</p> <p>The student has the ability to independently plan and implement the main experimental designs involving independent samples and repeated measures</p> <p>The student has the ability to independently plan and implement the main single-subject experimental designs;</p> <p>The student has the ability to independently test the moderating and mediating functions of variables</p>

### 7. Objectives of the discipline (outcome of the acquired competencies)

<sup>1</sup> One can choose either competences or learning outcomes, or both. If only one option is chosen, the row related to the other option will be deleted, and the kept one will be numbered 6.

<b>7.1 General objective of the discipline</b>	Having the knowledge on how to design an experiment/quasi-experiment, how to conduct inferential analysis and interpret the results. Developing the skills to design an experiment/quasi-experiment and to write a research proposal. Developing the skills to conduct inferential data analysis and correctly interpreting the results.
<b>7.2 Specific objective of the discipline</b>	Identifying the essential elements of an experiment/quasi-experiment. Correctly identifying the variables employed by a study (i.e., the dependent and the independent variables). Interpreting the results from a experimental/quasi-experimental study.

## 8. Content

8.1 Course	Teaching methods	Remarks
1.Review of knowledge from the first semester. Introduction to scientific experiments	Lecture, guided discovery, debate, inquiry	
2.Fundamentals of experimental psychology	Lecture, guided discovery, debate, inquiry	
3.The independent samples research design & the independent samples t test	Lecture, guided discovery, debate, inquiry	
4.The repeated measures design & the repeated measures t test	Lecture, guided discovery, debate, inquiry	
5.The one-way independent samples ANOVA	Lecture, guided discovery, debate, inquiry	
6.The one-way repeated measures ANOVA	Lecture, guided discovery, debate, inquiry	
7.The independent two-way ANOVA	Lecture, guided discovery, debate, inquiry	
8.The mixed factorial ANOVA	Lecture, guided discovery, debate, inquiry	
9.Non-parametric tests. Small-n designs	Lecture, guided discovery, debate, inquiry	
10.The basic principles of moderation analysis	Lecture, guided discovery, debate, inquiry	
11. The basic principles of mediation analysis	Lecture, guided discovery, debate, inquiry	
12.Single case experiments	Lecture, guided discovery, debate, inquiry	
13.The relevance of results: statistical, practical and clinical relevance	Lecture, guided discovery, debate, inquiry	
14.Content review and exam preparation	Inquiry	
<p><b>Bibliography</b></p> <p>Baron, R. M., &amp; Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. <i>Journal of Personality and Social Psychology</i>, 51(6), 1173–1182.</p> <p>Cohen, B. (2001) Explaining psychological statistics. John Wiley &amp; Sons, New York.</p> <p>Coolican, H. (2004) Research Methods and Statistics in Psychology. Oxford University Press.</p> <p>Grazziano, A. (1993) Research methods. A process of inquiry.</p> <p>Leary, M. (2001) Introduction to Behavioral Research Methods. Allyn &amp; Bacon, Boston</p> <p>Neuman, S. B., McCormick, S. (Eds.) (1995). Single-subject experimental research: Applications for Literacy, International Reading Association, Newark, Delaware</p> <p>Pintea S. (2010). The relevance of results in clinical research: statistical, practical and clinical significance. <i>Journal of Cognitive and Behavioral Psychotherapies</i>, vol. 10(1): 101-114</p> <p>Shaughnessy, J. J., Zechmeister, E. B. &amp; Zechmeister, J. (2012). Research methods in psychology. (Ninth Edi.). NY: McGraw Hill.</p>		

8.2 Seminar / laboratory	Teaching methods	Remarks
1. Principles of experimental control of variables. Exercises and applications	Practical applications, discussion, debate, modeling.	
2. The relationship between variable control and internal validity. The relationship between internal validity and external validity in experimental research. Exercises and applications	Practical applications, discussion, debate, modeling.	
3. Independent samples t-test. Exercises in JASP	Practical applications, discussion, debate, modeling.	
4. Paired samples t-test. Applications in JASP	Practical applications, discussion, debate, modeling.	
5. One-way ANOVA with independent samples. Exercises in JASP	Practical applications, discussion, debate, modeling.	
6. Repeated measures ANOVA. Exercises in JASP	Practical applications, discussion, debate, modeling.	
7. Two-way ANOVA with independent samples. Applications in JASP	Practical applications, discussion, debate, modeling.	
8. Mixed-design ANOVA. Exercises and applications in JASP	Practical applications, discussion, debate, modeling.	
9. Non-parametric data analysis. JASP applications	Practical applications, discussion, debate, modeling.	
10. Moderation model analysis. Applications in JASP	Practical applications, discussion, debate, modeling.	
11. Mediation model analysis. Applications in JASP	Practical applications, discussion, debate, modeling.	
12. Single-subject experimental analysis	Practical applications, discussion, debate, modeling.	
13. Multilevel analysis of results (statistical, practical, clinical). Applications in JASP	Practical applications, discussion, debate, modeling.	
14. Practicing the examination procedure and final review of the contents	Practical applications, discussion, debate, modeling.	
<p><b>Bibliography</b></p> <p>Baron, R. M., &amp; Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. <i>Journal of Personality and Social Psychology</i>, 51(6), 1173–1182.</p> <p>Cohen, B. (2001) Explaining psychological statistics. John Wiley &amp; Sons, New York.</p> <p>Coolican, H. (2004) Research Methods and Statistics in Psychology. Oxford University Press.</p> <p>Grazziano, A. (1993) Research methods. A process of inquiry.</p> <p>Leary, M. (2001) Introduction to Behavioral Research Methods. Allyn &amp; Bacon, Boston</p> <p>Neuman, S. B., McCormick, S. (Eds.) (1995). Single-subject experimental research: Applications for Literacy, International Reading Association, Newark, Delaware</p> <p>Pintea S. (2010). The relevance of results in clinical research: statistical, practical and clinical significance. <i>Journal of Cognitive and Behavioral Psychotherapies</i>, vol. 10(1): 101-114</p> <p>Shaughnessy, J. J., Zechmeister, E. B. &amp; Zechmeister, J. (2012). Research methods in psychology. (Ninth Edi.). NY: McGraw Hill.</p>		

### 9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

The content of this course meets the requirements of both the academic and professional communities. Based on the competencies acquired, students will not only become informed consumers of scientific research literature, but will also be able to design and implement scientific research studies. They will be able to work effectively with information derived from recent research in the field of psychology and cognitive sciences.

### 10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course	Correct, logical and coherent	Written exam	70%

	application of the concepts learned. Logical and accurate explanation and interpretation of the results.		
10.5 Seminar/laboratory	Being able to plan a research an analyze data using JASP	Research project	30%
10.6 Minimum standard of performance			
The minimum performance standard consists of obtaining at least half of the points on the written exam. In addition, attendance is required for at least 50% of the seminars.			

### 11. Labels ODD (Sustainable Development Goals)<sup>2</sup>

	General label for Sustainable Development						
							
							

Date:  
April 2025

Signature of course coordinator  
Sebastian Pintea

Signature of seminar coordinator  
Sebastian Pintea

Date of approval:  
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Signature of the head of department  
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