

Course title: Introduction to Research Methods in Psychology (30 hours), Instytut Psychologii PAN, 2019/2020

Instructor: dr. hab. Jerzy Karylowski, professor IP PAN, karylowski@psych.pan.pl

The course corresponds to the following general areas: Psychology, Research Methods, Statistics, Research Ethics

Goals and content

This will be a 30-hour survey course devoted to research methods in psychology. We will cover a wide range of topics ranging from the basics of scientific method and hypothesis testing in psychology, through the principles of statistical data analysis, to the recent challenges regarding reproducibility of research results. The questions of ethics in conducting psychological research will also be discussed. In conducting the class, we will try to achieve two, perhaps incompatible, goals: (1) covering the material at an advanced (doctoral) level, yet (2) without assuming that students have had previous experience (e.g., undergraduate classes) in those areas. To combine such goals will require hard work and flexibility on the part of both the students and the instructor. While the readings assigned will cover the material at the relatively basic level, in my lectures, I will, at least occasionally, attempt to venture into more advanced topics, not normally covered in introductory research methods classes. To save class time, there will be little overlap between readings and lectures. In general, readings will be discussed in class only when requested by students. Note that such specific requests to cover in class a particular topic from the readings, should be made by e-mail at least few days in advance.

Readings

Thanks to the Diener Education Fund, all required readings for this course have been compiled into a 195-page e-book entitled "Research Methods - Introduction to Research Methods in Psychology, Doctoral Program IP PAN, 2019". The book is free for all students enrolled in the course and is available from the IP PAN homepage.

Grading

The final grade will be based on the results of two exams, each covering about 50% of lectures and readings. Alternatively, the final grade will be determined by the final comprehensive (make-up) exam. Exam 1 will be given during the 5th week of classes and will cover lectures 1-4, and chapters chapters 1-6. For students not taking the final comprehensive (make up) exam, Exam 1 will contribute 40% to the final grade. Exam 2 will be given during the 10th week of classes and will cover lectures 5-8 and chapters 7-11. For students not taking the final comprehensive, Exam 2 will contribute 60% to the final grade. A final comprehensive will be optional and will be given at the completion of all class. The optional final comprehensive will cover the entire material of the course (all lectures and all readings). For students taking the final comprehensive, final grade will be based entirely on the results of that exam. No partial make-ups will be provided.

Educational outcomes: Knowledge

Students will become familiar with topics covered during the course

Educational outcomes: Skills and social competencies

Students will be able to critically read published psychological research to effectively communicate with others regarding design and validity of psychological research.

Class schedule

The course will be divided into 10 3-hour meetings. Eight of those meetings will be devoted to lectures and class discussions. The remaining two will be devoted to reviews/ answering student questions and to exams.

1

Why scientific method?
Hypothesis testing
Simple experiment
Systematic error and random error
The inevitability of random error
The role of statistical testing in assessing random error
Factors determining statistical significance

2

Type 1 and type 2 error
Power
T-test as an example of parametric test
Assumptions underlying parametric tests
Effects of violating assumptions of parametric tests: Monte Carlo simulations
Internal validity, external validity and construct validity
Independent variable and dependent variable
Theoretical constructs and their operational definitions (empirical indicators)
Ramifications of experimental research
Ethical and practical constraints in improving external validity and construct validity of experimental research

3

Correlational research
Internal validity, external validity, and construct validity of correlational research
Ethical considerations in correlational research
Data analysis in correlational research
Correlation coefficient vs. group comparison
Interpreting correlation coefficient
Relationship between correlation coefficient and t-test
Improving validity by combining experimental and correlational approaches

4

Factorial designs
Common notations for factorial designs

Main effects, interactions, simple main effects, and simple interactions
Ordinal and disordinal interactions
Ceiling effect and floor effect in ordinal interactions
Hidden interactions and replicability of results
Interpreting hidden interactions in terms of external validity and construct validity problems

5

Review for Exam 1
Exam 1 (40% of final grade)

6

Repeated-measure (within-subject) designs: power at a cost
Mixed designs
Random order vs. counterbalancing
Quasi-experimental designs
Systematic review of factors threatening internal validity in correlational and quasi-experimental research: history, maturation, testing, instrumentation, regression, selection, and mortality

7

Problems with replicability (aka. replicability crisis)

8

Ethical dilemmas in decisions to publish
Meta-analysis
Problems with replicability (aka. replicability crisis)

9

Replicability problems outside of psychology
“Methodological police”, Open Science movement, and other responses to problems of replicability

10

Review for Exam 2
Exam 2 (60% of final grade)

Note: this is a preliminary syllabus; subject to change