TEACHING GUIDELINES:

DESIGNS AND DATA ANALYSIS: EXPERIMENTAL METHOD

ACADEMIC YEAR: 2011-2012

Universidad del País Vasco
Euskal Herriko Unibertsitatea
Psikologia Fakultatea
Facultad de psicología

STUDIES: DEGREE IN PSYCHOLOGY

FACULTY: PSYCHOLOGY FACULTY

ACCADEMIC YEAR: 2011-2012

TEACHING GUIDELINES

1. BASIC DETAILS ABOUT THE COURSE

NAME: "Designs and Data Analysis: Experimental Method"		
CODE: 25088	ACCADEMIC YEAR: 2011/12	
MATTER TYPE= Mandatory (Obligatoria) (D=Basic same branch; S=Basic other branches; Y=Project; O=Mandatory or P=Optional)		
ECTS Credits: 6	YEAR: 3rd	SEMESTER: 1st
Requirements:		
Recommendations: It is encouraged to take this course once previous courses in the field of methodology of the behavioural sciences have been gained. It is a requirement to have the knowledge gained in the courses *Methodology in Psychology* (1st year), *Data Analysis and Designs: Non experimental method* (2nd year) and *Psychometry* (2nd year)		

2. BASIC DETAILS ABOUT THE TEACHING TEAM

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3. SPECIFIC AND TRANSVERSAL CONPETENCIES OF THE COURSE

Competency	Competencies
	SPECIFIC
1	Knowledge in hypothesis testing and inferential statistical analysis techniques
2	Knowledge about the main experimental and quasi-experimental design models
3	Ability of undertaking experimental and quasi-experimental research, bearing in mind validity threats and selecting adequate analysis strategies
4	Analysis of gathered data, based on an experimental and/or quasi-experimental design, by means of adequate statistical and computational resources
5	Knowledge about scientific article structure, critical analysis and the public defense of its inner discussion
6	Development, in team-work, of a research report according to APA guidelines and following the recommendations about ethical principles in research
7	Organization of individual and team work using adequately the available resources in order to acquire the knowledge and competencies required in the course
	TRANSVERSAL
12 (3rd year)	The ability to critically search, manage, analyse and synthesise psychological content based on documentation and information resources
13 (3rd year)	The ability to socialize and communicate in an effective manner and the ability to work individually as well as collectively, being able to take responsibility and collaborating effectively with others
14 (3rd year)	Knowledge about the legal framework and code of conduct that regulates the professional practice in psychology
15 (3rd year)	Acquisition of the required learning abilities to qualify students for self-learning

4. PROGRAM

4.1. THEORETICAL PROGRAM

1. Research and experimental design (comp. 2, 6, 7, 12, 15)

1.1. Design concept

1.2. Experimental, quasi-experimental and nonexperimental designs

1.3. Main classifying criteria for experimental methods

1.4. Reporting an experimental research

2. Research validity (comp. 3, 12, 15)

2.1. Validity concept and validity types

2.2. Statistical conclusion validity

2.3. Internal validity

2.4. Construct validity

2.5. External validity

3. Randomized experimental designs and data analysis (comp. 1, 2, 3, 4, 12, 15)

3.1. Two group and multigroup randomized designs and data analysis

3.2. Randomized experimental designs and data analysis

4. Experimental designs which reduce error variance and data analysis (comp. 1, 2, 3, 4, 12, 15)

4.1. Randomized block designs and data analysis

4.2. Latin square designs and data analysis

4.3. Hierarchical designs and data analysis

4.4. Covariation designs and data analysis

5. Experimental designs with totally and partially repeated measures and data analysis (comp. 1, 2, 3, 4, 12, 15)

5.1. Unifactorial designs with totally repeated measures and data analysis

5.2. Factorial designs with totally repeated measures and data analysis

5.3. Mixed experimental or partially repeated measures designs and data analysis

5.4 Crossover designs and within-subject Latin square designs, and data analysis

6. Quasi-experimental designs (comp. 2, 3, 12, 15)

6.1. Concept and classification of quasi-experimental designs

7. Single case and small N designs (comp. 2, 3, 12, 15)

7.1. Concept and classification of single case and small N designs

4.2. PRACTICAL PROGRAM

The main goal of the practical assignments is to provide to the students a series of competencies and knowledge to deal with experimental and quasi-experimental research.

Some assignments need to be developed individually while other assignments are carried out as part of a group. The practical assignments for this course are listed below:

1.- Methodological analysis of scientific articles and presentation of the resulting review

(Classroom practice) (comp. 5, 13)

Scientific articles or several sections of scientific articles in psychology are critically analysed based on methodological premises; research question, hypothesis, variables, sampling procedure, design type and data analysis.

The purpose of this assignment is to familiarise students with the content and structure of scientific articles; qualifying students for critically assessing the methodological quality, indicating strengths and weaknesses.

Meanwhile, students are expected to be capable of working as part of a team and clearly report, present and discuss their findings.

2.- Writing an ethics project for research with human and animals

(Seminar and computer lab) (comp. 14)

Explanation of the Ethical Principles of Psychologists and Code of Conduct and its relevance. Then, there is a practical approach to learn how to apply ethical principles for research purposes in psychology.

The task consist on watching a 10 minutes video which shows the classical Milgram experiment and working in discussion groups to produce an ethics project to replicate it grounded in UPV/EHU and APA ethics code of conduct guidelines.

By means of this assignment, it is intended to supply students with the knowledge and working experience of the ethics code of conduct with humans and animals for psychologists in research.

3.- Proposals of designs and data analysis methods to undertake experimental and quasi-experimental research

(Seminars and workshops) (comp. 1, 2, 3, 15)

Based on some practical cases given by the teacher, students are expected to suggest adequate designs and data analysis strategies to develop the different studies presented in the cases.

The goal of this assignment consists on qualifying students for selecting the most adequate designs and data analysis methods for each research case.

4.- Data analysis and interpretation associated to several design models

(Computer lab and seminars) (comp. 1, 2, 4, 15)

Computer lab assignments consist on the introduction, analysis, interpretation and writing the report of data corresponding to the different experimental and quasi-experimental designs using specific software for this type of analysis.

In the seminars, the student is required to analyse the data without the support of computers by hand.

The goal of this assignment consist on qualifying students for selecting the most adequate data analysis procedure to test different types of hypothesis, analyse data and interpret its results.

5.- Writing a research report

(Lab practice and computer lab) (comp. 6, 7, 12, 13)

The assignment consist on running an experiment where a few students take part in the role of experimenters and the rest of the students take part as participants. Next, based on the obtained data, the students develop a research report following APA guidelines working in teams.

The goal of this assignment consist on qualifying students for literature review, posing research problems and questions, formulating hypothesis, data gathering, indicating the design, analysing data, interpreting results and elaborating the research report. Additionally, it is expected to reinforce teamwork.

5.-COURSE SCHEDULE

Week	Date	Lectures	Classroom practice	Computer labs	Workshps	Seminars	Lab practice	Half-term	Assignments
1	09-09/13-09	4							
2	16-09/20-09	4							
3	23-09/27-09	2			W1		LP1		
4	30-09/04-10	2				S1	LP2		
5	07-10/11-10	2		CL1	W2				
6	14-10/18-10	2	CP1	CL2					
7	21-10/25-10	2	CP2	CL3					Methodological analysis of articles (10%)
8	28-10/01-11	2	CP3	CL4				35%	
9	04-11/08-11	2	CP4	CL5					ANOVA (5%)
10	11-11/15-11	2	CP5	CL6					
11	18-11/22-11	2		CL7		S2			Report(10%)
12	25-11/29-11	1	CP6 & CP7	CL8					
13	02-12/06-12	1	CP8 & CP9	CL9					ANOVA (5%)
14	09-12/13-12	2	CP10		W3				
15	17-12/21-12	2	CP11		W4				
	Teaching vecto	**32**	**11**	**9**	**4**	**2**	**2**		

6. ASSESSMENT PROCEDURE (THEORY AND PRACTICE)

The assessment process takes into account the acquisition level of both, specific competetencies and transversal competencies. The theoretical part covers 70% of the global mark and 30% the practical.

The acquisition of knowledge and competencies associated to the **THEORETICAL PART** is assessed by means of two half-term exams and/or theoretical assignments. The weight of the final score is divided in the next way:

- **Half-term exam** (35%)
- **Final exam** (35%)

- **Final exam** (70%)

- **Theoretical assignments** (50%)
- **Final exam** (20%)

The acquisition of knowledge and competencies associated to the **PRACTICAL PART** is assessed by means of five assignments corresponding to activities 1, 4 and 5 of the practical program of the course. The assignments and the weight of each assignment in the final score is divided as follows:

- **Methodological Analysis of two scientific articles and public presentation of the analysis** (10%)

This assignment is associated to the classroom practice activity.

- **Data analysis and interpretation of two of the designs described in the lectures** (10%)

This assignment is associated to the computer lab and seminar activities.

- **Writing a search report** (10%)

This assignment is associated to the lab practice and computer lab activities.

Some of the practical activities are carried out individually and some in groups of two people, and require an important amount of non-presential workload.

In order to participate in **continuous evaluation** is necessary to follow the dynamic of the practical lectures on an every day basis and meeting the assignment deadlines.

Those students who do not meet the requirements to take part in the continuous evaluation, have the possibility to sit a final theoretical/practical exam in January and/or July.

7. REFERENCES / BIBLIOGRAPHY

BASIC:

W. R. Shadish, T. D. Cook and D. T. Campbell (2002) "Experimental and Quasi-Experimental Designs for Generalized Causal Inference" Boston: Houghton Mifflin Company

S. E. Maxwell and H. D. Delaney (2004) "Designing Experiments and Analyzing Data: A Model Comparison Perspective" Mahwah, NJ: Lawrence and Erlbaum Associates.

A. Field (2005) "Discovering Statistics Using SPSS" London, UK: SAGE Publications.

ADDITIONAL:

Anguera, M.T., Arnau, J., Ato, M., Martínez, R., Pascual, J. y Vallejo, G. (1995). *Métodos de investigación en psicología*. Madrid: Síntesis.

Arnau, J. (2001) (Coord.). *Diseños de series temporales: técnicas de análisis*. Barcelona: Edicions Universitat de Barcelona.

Ato, M. y Vallejo, G. (2007). *Diseños experimentales en psicología*. Madrid: Pirámide.

Balluerka, N. y Vergara, A.I. (2002). *Diseños de investigación experimental en psicología*. Madrid: Prentice-Hall.

Balluerka, N. eta Isasi, X. (2003). Ikerkuntza psikologian. Ikerketa-baldintzak eta diseinuaren baliotasuna. Bilbo. UEU.

Balluerka, N., Gómez, J. e Hidalgo, M.D. (2005). The Controversy over Null Hypothesis Significance Testing Revisited. *Methodology, 1* (2), 55-70.

Balluerka, N., Vergara, A.I. y Arnau, J. (2009). Calculating the main alternatives to null-hypothesis significance testing in between-subject experimental designs. *Psicothema, 21* (1), 141-151.

Balluerka, N. (2011). *Planificación de la investigación. La validez del diseño (2º ed. revisada)*. Salamanca: Amarú.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.)*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Gorostiaga, A. eta Balluerka, N. (2007). *Ikerketa metodoak eta diseinuak psikologian*. Donostia: erein.

Huitema, B.E. (1980). *The analysis of covariance and alternatives*. New York, NY: John Wiley Sons.

Toothaker, L.E. (1991). *Multiple comparisons for researchers*. Newbury Park, CA: Sage.

Wilcox, R.R. (2001). *Fundamentals of modern statistical methods. Substantially improving power and accuracy*. New York, NY: Springer-Verlag.

Wilkinson, L. and the Task Force on Statistical Inference (1999). Statistical methods in psychology journals. Guidelines and explanations. *American Psychologist, 54*, 594-604.

INTERNET RESOURCES:

•Colegio Oficial de Psicólogos (C.O.P.). Madrid, España.
http://www.cop.es/

•American Psychological Association (A.P.A.). Washington, DC, USA.
http://www.apa.org/

•Asociación española de Metodología de las Ciencias del Comportamiento (AEMCCO)
http://www.aemcco.es/

•Consejo Superior de Investigaciones Científicas (C.S.I.C.). España.
http://www.csic.es/

•Institute of Scientific Information (I.S.I.). Philadelphia, USA.
http://www.isinet.com/isi/

•Social Research Methods. Trochim, W.K. Center for Social Research Methods, Cornell University, USA.
http://trochim.human.cornell.edu/

RELATED PUBLICATIONS:

American Psychologist. Washington, DC: American Psychological Association.

Educational and Psychological Measurement. London, UK: Sage Periodical Press.

Journal of Experimental Psychology: General. Washington, DC: American Educational Psychology.

METHODOLOGY. European Journal of Research Methods for the Behavioral and Social Sciences. Revista de la European Association of Methodology.

Psicothema. Oviedo, SP: Facultad de Psicología de la Universidad de Oviedo y Colegio Oficial de Psicólogos del Principado de Asturias. Los artículos en pdf pueden descargarse de la web: http://www.psicothema.com.

Psychological Bulletin. Washington, DC: American Psychological Association.

Psychological Methods. Washington, DC: American Psychological Association.

Psychometrika. Iowa City, IA: Psychonomic Society.

8. TUTORING HOURS

The tutoring timetable can be accessed through:

- GAUR
- Moodle