# Teaching plan for the course unit

## General information

**Course unit name:** Workshop on Data Analysis  
**Course unit code:** 568388  
**Academic year:** 2014-2015  
**Coordinator:** DAVID LEIVA UREÑA  
**Department:** Department of Methodology of the Behavioural Sciences  
**Credits:** 2,5

## Estimated learning time

<table>
<thead>
<tr>
<th>Face-to-face learning activities</th>
<th>Total number of hours 62,5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>24</strong></td>
<td></td>
</tr>
<tr>
<td>- Lecture with practical component</td>
<td>24</td>
</tr>
<tr>
<td>Supervised project</td>
<td>15</td>
</tr>
<tr>
<td>Independent learning</td>
<td>23,5</td>
</tr>
</tbody>
</table>

## Recommendations

### Further recommendations

Basic knowledge of applied statistics (i.e., an introductory course on descriptive statistics and inference) is advisable.
To display basic knowledge regarding some data analysis techniques. Specifically for descriptive statistics, inference, meta-analysis and single-case designs methodology and analysis.

To demonstrate proficient use of some analytical tools already developed under the statistical environment R for descriptive statistics, inference, meta-analysis and single-case designs.

To get to know how to develop new statistical techniques, customize existing routines according to their own research interests. The emphasis is made on free-software tools developed in R.

To be able to make technical reports and/or presentations regarding meta-analysis and single-case designs in their own research field.

Learning objectives

Referring to knowledge

- To know main tools for statistical analysis under the statistical environment R.

- To be acquainted with the most common meta-analytical procedures when combining results from a set of original articles.

- To know the particularities of single-case designs and how these features affect the possibilities of data analysis.
Referring to abilities, skills

- To use R (and R-Commander) for analyzing data for descriptive statistics and inference.

- To develop basic programming skills with R.

- To design and create scientific documents using some tools for Literate Programming with R as Sweave, Knitr and R Markdown.

- To use efficiently R tools for meta-analysis.

- To display efficient use of analytical tools in R for single-case designs.

Referring to attitudes, values and norms

- To maintain their knowledge updated in order to apply the best available analytical option for quantitative integration and single-case designs.

Teaching blocks

1. R for researchers
   1.1. R and R-Commander
   1.2. Statistics with R
   1.3. Introduction to R programming

2. Meta-analysis
   2.1. Integrating results in psychology
   2.2. Steps in a meta-analysis
   2.3. Advanced topics in meta-analysis
2.4. *Metafor*: R package for meta-analysis

3. **Single-case designs**

3.1. Single-case designs features

3.2. Visual analysis and visual aids

3.3. Quasi-statistical procedures: nonoverlap and raw indices

3.4. Standardized mean difference

3.5. Regression analysis

3.6. Simulation modeling analysis

3.7. Randomization tests

3.8. Single-case designs analysis with R and R-Commander

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**Teaching methods and general organization**

The theoretical explanations in all three parts will be complemented with examples. The use of R and R-Commander in the sessions will enable the students to play with the topics discussed during the course. The three-way interaction between the professors, the students, and the R program is intended to offer the possibility for a procedural and not only declarative knowledge of the workshop topics.

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**Official assessment of learning outcomes**

The assessment is based on two types of tasks: a set of activities to be done during sessions and a course work consisting of three different parts. Weights are as follows:

- Activities during the sessions: 25% of the grade.
- Course work: 75% of the grade (25% for each of the three parts).

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**Reading and study resources**

**Book**

Recommended readings for Part 3: Single-case designs


Recommended readings for Part 2


Recommended readings for Part 2


Additional readings for Part 1


Recommended readings for Part 2


Recommended readings for Part 2


Recommended readings for Part 1

Article

Bulté, I., & Onghena, P. (2012). When the truth hits you between the eyes: A software tool for the visual analysis of single-case experimental data. Methodology, 8, 104-114.

Recommended readings for Part 3: Visual analysis


Recommended readings for Part 1


Recommended readings for Part 3: Randomization tests


**Recommended readings for Part 3: Regression analysis**


**Recommended readings for Part 1**


**Recommended readings for Part 3: Procedures related to visual analysis**