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**Title of the course**

- **230306 Introduction to Regression Analysis: Linear and Logit Regression**

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**Organizing center/area leading the course**

Deusto International Research School (DIRS) – PhD program in Human Rights: Ethical, Social and Political Challenges

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**Training category**

Methodology and research techniques

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**Professor/Coordinator of the training course**

Coordinator: Edurne Bartolomé Peral

Lecturers: Jon Paul Laka, Edurne Bartolomé Peral

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**Priority group**

Any year PhD, provided that they comply with prerequisites

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**Competences**

*To prepare an application, to design, implement, manage, develop, and evaluate research projects related to topics in the fields of social sciences, making use of regression data analysis and its interpretation*

Expected Learning outcomes:

- Students identify a research problem and establish the strategy to define the research questions, working hypothesis and regression analysis that seem adequate in each case.
- They relate and connect a given research question with the hypotheses connecting theory with explanatory analysis using regression
- Students derive the relevant conclusions from the results of the regression analysis and their coefficients and connect them back with the research question and hypotheses.

**CE.3.** *To design and apply, in adequate ways, the methods of the Social Sciences at the different stages of a research project (formulating hypotheses, considering various techniques, designing and analyzing the results) related to social sciences*

Expected learning outcomes:

- Students connect existing theories from the literature with their object of study and provide an argumentation for their theoretical model
- They are able to discern the advantages and shortcomings of different theories and methodological techniques.
- They understand and apply a logical sequence of the scientific method in terms of hypothesis formulation and hypothesis testing through regression analysis
- They carry out basic regression analyses and interpretation of results
- They are able to interpret statistical outputs and relate them to their object of study, as well as to judge the adequacy of the methods in view of the prescribed standards of quality.

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### **Pre-requisites / prior knowledge**

Basic knowledge of quantitative methodology, descriptive and parametric/inferential.

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### **Contents**

-Introduction: The regression logic:

- Relations between variables, association, predictors
- Dependent and independent variables
- Theoretical models and inference

- Applied Linear regression with SPSS

- The explained variable in the model: understanding metric variables
- The explanatory variables: the linear function
- The model parameter estimates: significance and interpretation of results
- Fitted values and residuals
- How good is our model:  $R^2$

- Applied Logistic Regression with SPSS

- The explained variable in the model: to be or not to be
- Definition of the linear predictor: from probability to odds, from odds to logit
- The explanatory variables: metric & categorical variables
- The model parameter estimates: significance and interpretation of results
- Fitted probabilities by the model
- Confusion matrix: predicted classification of individuals
- How good is our model: AIC, Deviance

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**Level of the course**

Intermediate

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**Methodology**

Theoretical class in the first part to understand basic concept concepts and basic knowledge and practical applications with data, applying models with SPSS in the computer lab in order to settle the knowledge acquired in the theoretical class.

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**Language of instruction**

English

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**Mode of instruction**

In-class and virtual attendance

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**Number of places**

PhD students: 20 max

Personnel: no

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**Assessment**

The assessment will be done through the elaboration of a short paper in which students develop a theoretical model based on theory and perform a regression analysis to test their hypotheses.

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**Number of hours**

6 hours

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**Bilbao Campus**

- Month when the course begins: February 2023
- Schedule:
  - Monday, 12 February 2024, 15:00-18:00
  - Thursday, 15 February 2024, 15:00-18:00