

Materia 1_2: Fundamentals of Statistics

Materia:	Fundamentals of Statistics	ECTS:	10
Descriptor	<ul style="list-style-type: none"> • Introduction to Statistics and Data analysis. Data wrangling. Description of continuous and categorical data. Data visualization. Discrete and continuous probability distributions. Statistical Inference. Resampling methods. • Categorical Data Analysis. Sampling design. Analysis of Variance (ANOVA). Introduction to the Experimental Design. Multiple Regression. Introduction to Multivariate Analysis. 		
Objetivos generales	This subject has the objective of selecting the most appropriate data analysis to respond to a need for information raised by the organization, correctly applying and explaining the results obtained according to the statistical background of the data analysis technique.		
Competencia específica	CE[1-2]: Apply basic statistical procedures and tools to solve engineering-related problems.		
Resultados de aprendizaje	<ul style="list-style-type: none"> • Comprehend the structure of a data set and assess whether it allows to answer a research question of interest for the organization. • Clean and prepare a dataset for exploration and analysis. • Describe graphically and numerically the information contained in quantitative and qualitative variables, at a one-dimensional level and segmented by strata. • Compute probabilities according to the probability distribution supporting continuous and discrete random variables contained in a dataset. • Write statistical hypotheses and assess their acceptance or rejection using critical values and p-values in the context of engineering problems associated with data analysis. • Compute and apply confidence intervals for the main parameters and comprehend their meaning. • Select the most appropriate resampling method according to the objectives of the data analysis. • Choose the right inference technique to analyse categorical data. • Explain the impact of a set of parameters on a quantitative random variable. • Design an appropriate set of tests to analyse main and interaction effects on a variable of quantitative interest. • Predict the value of a random variable in terms of a set of quantitative and qualitative independent variables. • Interpret the parameters of the obtained regression model and determine the goodness of fit of regression. • Know the main data analysis techniques that allow to analyse multiple variables simultaneously to identify patterns and relations among them. 		
Métodos de evaluación	<ul style="list-style-type: none"> • Evaluation: Written open-ended test and Problems • Assessment instruments: Checklists and Rating Scales 		