UCLouvain

lpsp1209

2021

Statistics, inference on one or two variables

4.00 credits	22.5 h + 15.0 h	Q1

Teacher(s)	Bertrand Aurélie (compensates Pircalabelu Eugen) ;Bertrand Aurélie (compensates Govaerts Bernadette) ;Govaerts Bernadette ;Pircalabelu Eugen ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	*The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Learning outcomes	
Evaluation methods	*The procedures relating to the evaluation of the class are described and available on the course website on the Moodle platform.* *The evaluation has 3 components:* • *A written exam composed of multiple choice and open questions covering the probability part of the course, the concepts of statistical inference and the interpretation of SPSS output.* • *A test using SPSS and consisting in carrying out the complete analysis of a dataset with SPSS going through different stages: choice of method, use of SPSS, interpretation of the output, writing of a report in Word.* • *Homework and practical work to be done at home during the semester.* The breakdown of marks for these three parts is 15/20 for the written exam, 3/20 for the SPSS test and 2/20 for homework and preparations during the semester. The exact evaluation methods could be adapted according to the constraints linked to the sanitary conditions in force at the time of the exam sessions.
Teaching methods	The class is based on a series of activities aimed at bringing the student to discover, appreciate, understand, put into practice and integrate the material throughout the semester. These include: • Lectures with the course instructor based on numerous examples, interpretation of software outputs and fun games organized during the course. • Small group probability and statistical inference exercise sessions. • Self-study at SPSS via: podcasts, drill exercises, case studies and a self-test. • Optional collective practical sessions to integrate the BAC 2 materials or review BAC 1 subjects. • Exercises, simulations and other activities to be done at home aimed at integrating the subject by self-learning.
Content	The class covers the following topics: • Elements of probability necessary to understand and know how to use general inference and statistical modeling tools: elementary probability calculation on events, normal and binomial and derived probability distributions, use of tables, central limit theorem. • Key concepts of parametric statistical inference: estimator, sampling distribution, confidence interval and hypothesis testing, the power of hypothesis test and influence of the choice of sample size. • Tests and confidence intervals for the mean and the variance in a normal population. • Hypothesis tests on two means for paired and independent samples and on 2 variances in normal populations. • Nonparametric tests on one or two location measures for paired or unpaired data. • Inference on a correlation coefficient, including partial correlation. • Inference on one or 2 categorical variables: test and confidence interval on one or two proportions, chi-square test of adjustment for one or 2 variables. • Conditions of application and validation of the assumptions underlying the various tests, qq plot. • Methodology for the statistical analysis of data from the choice of the method, its application, its validation, to the interpretation of the results obtained. • Introduction to SPSS software and use in various situations.
Inline resources	See the moodle site: https://moodleucl.uclouvain.be/course/view.php?id=9621
Faculty or entity in charge	EPSY

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Psychology and Education : Speech and Language Therapy	LOGO1BA	4	LPSP1011	
Minor in Linguistics	MINLING	4		
Mineure en statistique et science des données	MINDATA	4		
Bachelor in Psychology and Education: General	PSP1BA	4	LPSP1011	
Certificat d'université : Statistique et sciences des données (15/30 crédits)	STAT2FC	4		
Master [120] in Data Science : Statistic	DATS2M	4		