lpsp1209
2023

Statistics, inference on one or two variables

UCLouvain

4.00 credits	22.5 h + 15.0 h	Q1

Teacher(s)	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 exact evaluation methods could be adapted according to the constraints linked to the particula conditions in force at the time of the examination sessions. January session: 1. A 3-hour closed-book written exam consisting of open and/or multiple-choice questions and covering the probability part of the course, the concepts of statistical inference and the fine reading of SPSS outputs. The exam is used to test your knowledge at the level of general understanding of the course to answer specific questions in practice, make calculations, etc. The use of the formulae booklet is permitted. 2. An interrogation on SPSS (off-session in December) with closed book for 1h15 consisting of carrying out the complete analysis of a series of data with SPSS going through different stages: choice of method, use of SPSS, interpretation of the outputs. The use of the formulae booklet is permitted. The interrogation is composed of open and/or multiple choice questions. 3. MCQ homework on Moodle and preparations for practical work to be done at home during the semester. To validate this part, the student must pass each MCQ with the minimum mark that corresponds to each activity. The distribution of marks for these three parts is 14/20 for the written exam, 5/20 for the SPSS test and 1/20 for homework and preparations during the semester. The final grade for the LPSP1209 course is given by the points obtained for the assignments + the points obtained for the SPSS test + the points obtained for the exam. To pass the course, the student needs to score at least 7.5/14 (no rounding) for the written exam and 2.5/5 (no rounding) for the SPSS test. August session: 1. A 3-hour closed-book written exam consisting of open and/or multiple-choice questions and covering the probability part of the course, the concepts of statistical inference and the fine reading of SPSS outputs. The exam is used to test your knowledge at the level of general understanding of the course to answer specific questions in practice, make calculations, etc. The use of the formulae booklet is permitted. 2. A closed book interrogation on SPSS for 1h15 consisting of carrying out the complete analysis of a series of data with SPSS going through different stages: choice of method, use of SPSS, interpretation of the outputs. The use of the formulae booklet is permitted. The interrogation is composed of open and/or multiple choice questions. The distribution of marks for these two parts is 15/20 for the written exam, 5/20 for the SPSS question, because the continuous assessment is provided only for work during the semester. The final grade for the LPSP1209 course is given by the points obtained for the SPSS test + the points obtained for the written exam. To pass the course, the student needs to score at least 7.5/15 (no rounding) for the written exam and 2.5/5 (no rounding) for the SPSS quiz.
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 output. • 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. Attendance at lectures and practical exercise sessions is MANDATORY!
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 its use in various situations.
Inline resources	See the moodle site: https://moodleucl.uclouvain.be/course/view.php?id=9621
Bibliography	David C. Howel (2006). Méthodes statistiques en sciences humaines. 6eme ed. De Boeck Supérieur.
Other infos	The courses listed below provide important foundations for understanding and integrating the material in this course. LPSP1011 : Statistiques : Analyse descriptive de données quantitative
Faculty or entity in charge	EPSY

Programmes containing this learning unit (UE)

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