UCLouvain	**wfarm1247** *2023*	**Statistical data processing**

3.00 credits	15.0 h + 15.0 h	Q2

Teacher(s)	Pircalabelu Eugen ;
Language :	French
Place of the course	Bruxelles Woluwe
Prerequisites	Mathematical notions. *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.*
Main themes	The objective of this course is to give a basic knowledge in the statistical data processing related with the biomedical domain. The course also deals with how computer software, in particular JMP (SAS) can be used to present and analyze data. The course comprises theoretical lectures and exercise sessions: One- and two-dimensional descriptive statistics. Inferential statistics: populations and samples, probabilities, variables, theoretical distributions, confidence intervals (means, variance, proportion), hypothesis testing based on sample means (Student t-test) and proportions.
Learning outcomes	**At the end of this learning unit, the student is able to :**
	1 This course is designed to introduce the students to the statistical and methodological issues applied to problems in the biomedical sciences and to avoid the common pitfalls in data analysis. At the end of the course the successful student will be able to use the techniques of inferential statistics within the framework of his/her research. The course focuses on the most frequently used statistical methods. The underlying mathematical developments are limited to a strict minimum and replaced by intuitive reasoning and concrete examples, especially via practical exercise sessions. The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled 'Programmes/courses offering this Teaching Unit'.
Evaluation methods	The exam is used to test students' knowledge of general understanding of the course, to answer specific questions in practice, to do calculations by hand, to use JMP software to do statistical analysis, to interpret results, etc. . Students will be quizzed on the entire subject matter and the exam is composed of open-ended and/or multiple-choice questions. June session: 1. 3-hour exam, face-to-face, closed book, possibility of using a calculator (non-programmable) and a formulae sheet. The exam has 2 parts: a theoretical part without JMP (for 7/20 of the final course mark) and another applied part on computer with the JMP software (for 12/20 of the final course mark). 2. MCQ homework on Moodle and preparations for practical work to be done at home during the semester (for 1/20 on the final grade of the course). Attention: To validate the course, the student needs to obtain at least 3/7 (no rounding) for the written exam and 7/12 (no rounding) for the JMP test. August session: 3-hour exam, face-to-face, closed book, possibility of using a calculator (non-programmable) and a formulae sheet. The exam has 2 parts: a theoretical part without JMP (for 7/20 of the final course mark) and another applied part on computer with the JMP software (for 13/20 of the final course mark). Attention: To validate the course, the student needs to obtain at least 3/7 (no rounding) for the written exam and 7/13 (no rounding) for the JMP test. The exact evaluation methods could be adapted according to the constraints linked to the particular conditions in force at the time of the examination sessions.
Teaching methods	The class consists of lectures (15h) and exercises sessions (15h). Attendance at lectures and practical exercise sessions is **MANDATORY** !
Content	This course includes lectures and exercises with the JMP software. It contains a summary of the concepts of univariate and bivariate descriptive statistics: produce useful graphical and numerical summaries like mean, median, standard deviation, variance, confidence interval. It focuses mainly on the basic issues of statistical inference: population and sample, probabilities, random variables, distribution functions, type 1 and type 2 errors, confidence intervals (mean, variance and proportion) and hypothesis tests related to the mean (Student's t) and proportions.

Inline resources	Site Moodle du cours : WFARM1247 - Traitement statistique des données. https://moodleucl.uclouvain.be/course/view.php?id=9327
Bibliography	• Triola, M.M., Triola, M.F. and Roy, J. (2018) Biostatistics for the biological and health sciences, Pearson Education, 2nd edition. • Rosner B. (2010) Fundamentals of Biostatistics. Duxbury, 7th edition. • Zar, J.H. (2010) Biostatistical analysis, Pearson Education, 5th edition. • Forthofer, R.N., Lee, E.S., and Hernandez M. (2007) Biostatistics. A guide to Design, Analysis and Discovery, Elsevier, 2nd edition. • Senn, S. (2007) Statistical Issues in Drug Development, Wiley, 2nd edition.
Faculty or entity in charge	FARM

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Approfondissement en sciences pharmaceutiques - recherche	APPFARR	3		🔍
Bachelor in Biomedicine	SBIM1BA	3	WMD1102 AND WSBIM1001 AND LANGL1854	🔍
Bachelor in Pharmacy	FARM1BA	3	WMD1102	🔍
Additionnal module in Pharmacy	APPFARM	3		🔍
Certificat d'université : Statistique et science des données (15/30 crédits)	STAT2FC	3		🔍