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6.00 credits

45.0 h + 22.5 h

Q1

Teacher(s)	Heuchenne Cédric ;
Language :	French
Place of the course	Bruxelles Saint-Louis
Prerequisites	<i>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.</i>
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <ul style="list-style-type: none"> • understand and explain the basic techniques of probability and statistics ; • identify when they can be used ; • solve exercises involving those techniques and interpret the obtained results.
Evaluation methods	The evaluation is based on a written exam, without access to materials. It consists of both methodological questions and practical applications. Students may use an official (unannotated) formula glossary, statistical tables, and a non-programmable calculator. These tools are not provided by the teacher during the exam.
Teaching methods	<p>a) The lecture course introduces the theoretical and methodological foundations of statistical analysis. It includes examples primarily chosen from the fields of economics and management, aimed at understanding and illustrating the methodology as well as applying statistical theory. Special attention is given to the growing use of statistics to attempt to solve and/or understand contemporary issues.</p> <p>Throughout the course, efforts are made to involve students in the development and discovery of statistical concepts and their applications. Active participation in this learning process should enable students to fully benefit from the practical sessions (PS) that complement the lecture course.</p> <p>The course is based on a syllabus provided to students, which serves as the main teaching resource, in addition to videos.</p> <p>This course serves as a gateway to various courses that will follow in the students' curriculum.</p> <p>b) The practical sessions (PS) are conducted by a teaching assistant. They are based on a collection of exercises (constantly being improved) made available to students. The assistant will decide on the arrangements for organizing the practical sessions and will respond to student questions according to the procedures he/she communicates to them. These sessions briefly review the material covered in the preceding lecture; they allow students to verify if they have understood the material and apply it through exercises provided to them. To get the most out of each practical session, students are encouraged to review the relevant material beforehand.</p> <p>c) Regular independent work is essential for success in the exam. As the course progresses, each student should dedicate enough personal study time to ensure they understand the material. By the end of the semester, the period leading up to the exam should not be one of discovery but rather a time to review material that has already been understood. Personal work should not involve memorizing incomprehensible formulas by heart. What will be assessed in the exam is not the student's ability to rewrite information but rather her/his understanding of concepts and explanatory mechanisms, as well as his/her ability to apply them.</p>
Content	<p>Reminder on Probability</p> <p>Bivariate random variables (syllabus, chapter 4)</p> <p>First part: statistical inference</p> <ol style="list-style-type: none"> 1) Sampling (syllabus, chapter 5) 2) Punctual estimation (syllabus, chapter 6) 3) Maximum likelihood estimation method (syllabus, chapter 13) 4) Estimation by intervals (syllabus, chapter 7) 5) Hypothesis tests (syllabus, chapter 8) <p>Second part: applications</p> <ol style="list-style-type: none"> 1) Variance analysis (ANOVA1/ANOVA2) (syllabus, chapter 9) 2) Linear adjustment (syllabus, chapter 10) 3) Simple linear regression (syllabus, chapter 11) 4) Chi-squared tests (multinomial test, adjustment tests, contingency tables) (syllabus, chapter 12)
Inline resources	See the moodle page of the course.

Bibliography	<ul style="list-style-type: none"> - Wonnacott T. H. and R. J. Wonnacott, Statistique: Economie - Gestion - Sciences - Médecine (avec exercices d'application), Paris, Economica, 4ème ed., 2000. - Wackerly D. D., Mendenhall W and R.L. Scheaffer, Mathematical Statistics with Applications, Duxbury Press, 7th ed., 2007. - Mendenhall W, Beaver R. J. and B. M. Beaver, Introduction to Probability and Statistics, Duxbury Press, 14 ed., 2012. - Mood A.M., Graybill F.A. and D.C. Boes, Introduction to the Theory of Statistics, Mc Graw Hill Ed., 1974. (http://www.colorado.edu/economics/morey/7818/MoodGraybillBoesBook/MGB3rdSearchable.pdf) - Rohatgi V. K. and A. M. Md. Ehsanes Saleh, Introduction to probability and Statistics, Wiley- Interscience; 2d ed., 2000. - Tribout B., Statistique pour Economistes et Gestionnaires, Pearson Education France, Édition : 2e éd., 2013. - Rohatgi V. K. and A. M. Md. Ehsanes Saleh, An Introduction to Probability and Statistics, Wiley Series in Probability and Statistics, 3rd ed., 2015.
Other infos	Students will have access to videos, a syllabus, a collection of exercises, a formula glossary, and statistical tables.
Faculty or entity in charge	ESPB

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Economics and Management	ECGB1BA	6	BECGE1132	
Bachelor in Economics and Management (French-English)	ECAB1BA	6	BECGE1132	
Bachelor in Economics and Management (French-Dutch-English)	ECTB1BA	6	BECGE1132	