



4.00 credits

30.0 h + 22.5 h

Q2

Teacher(s)	Uyttendaele Nathan ;
Language :	French
Place of the course	Bruxelles Saint-Louis
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>The fundamental purpose of statistics is to derive results from a sample that are valid for the entire population. This inductive approach is called "Statistical Inference". In a preliminary stage, the sample must be simplified by representing it, without losing too much information, by means of graphs and tables that are as adequate as possible and reducing it to a few numbers that describe it. This is the role of Descriptive Statistics which constitutes the first part of the course.</p> <p>In order to go beyond the simple description of the sample and to draw valid conclusions about the underlying population, one must make additional hypotheses about the way in which the sample data were generated; this is the role of Probability Theory, which provides this indispensable tool for any inferential approach. This inductive approach introduces uncertainty; probability theory also allows us to attach a measure of reliability to any inferential conclusion. The second part of the course will therefore be an introduction to probability.</p> <p>The aim of the first part of the course is to familiarize students with the first tools of Descriptive Statistics; tools which they are confronted with on a daily basis, if only because of the media, which makes great use of them. In addition to its interest in describing a state of affairs or a sample, Descriptive Statistics provides an easy introduction to Probability Theory. The second part of the course aims at introducing the probabilistic reasoning mode.</p> <p>At the end of this course, students should be sufficiently comfortable in understanding and manipulating Descriptive Statistics and Probability (simple) to be able to take the Applied Statistics course in BLOC2; Descriptive Statistics and Probability are the first steps and are treated as such.</p>
Evaluation methods	<p>The certification evaluation will take place in June and August, in person. It will be a paper-based exam, using a basic calculator (single-line display), without any formula sheets, and with closed books. Solved examples from previous years' exams will be available on the course's Moodle page starting from the first lecture.</p> <p>The type of exam is designed to assess the student's mastery of the technical and computational aspects of the course, their rigor in these areas, their ability to interpret the results obtained, and to evaluate their reasoning. Such an evaluation not only tests the student's understanding of the course (understanding the concepts and their application in exercises, and being able to interpret results) but also requires the ability to go a bit beyond the material covered in lectures and practical sessions, using their own initiative. In other words, it involves making the effort to fully grasp the course material in order to be able to use it effectively.</p> <p>The June and/or August evaluations will in no way be an identical replica of previous exams. Simply focusing on previous exams and practical exercises will not be enough to succeed in this course; it is entirely insufficient.</p> <p>Note:</p> <p>This course plan may evolve over the course of the term, depending on the dynamics with the students, and from year to year as improvements are made to the lectures and practical sessions.</p>
Teaching methods	<p>The lecture and practical sessions are held in person;</p> <p>a) The lecture systematically introduces the methodological foundations of descriptive statistics and the theoretical foundations of probability, accompanied by examples intended to illustrate these theories. A particular effort is made throughout the course and practical sessions to involve students in the development and discovery of new concepts and their applications. Active participation in the course, practical sessions, or through watching videos is expected from students to fully benefit from the practical work, which complements the lecture, and to be immediately engaged in a research-oriented approach.</p> <p>b) The practical sessions are based on numerous exercises taken from the reference book for this course.</p> <p>c) An active and participative attitude during both the lectures and practical sessions, as well as participation in any question-and-answer sessions, is essential; the chances of success depend on it. Regular personal work (including finding solutions to the proposed exercises) must be done by the student starting from the first week of the course. It is absolutely crucial that students get into the rhythm of the course from the beginning of the term by participating weekly in the lectures and practical sessions.</p> <p>Each student must therefore dedicate sufficient personal study time to ensure they understand and master the material, using the lectures, course slides, and practical session materials. By the end of the term, the period leading up to the exam should not be one of discovery but rather of reviewing material that has already been understood and assimilated.</p> <p>The expected personal work is by no means rote memorization. What will be assessed in the exam is not the student's ability to regurgitate information but rather their in-depth understanding of concepts and explanatory mechanisms and their ability to use them appropriately.</p>

<p>Content</p>	<p>The main course material consists of the reference book <i>"Notions de statistique,"</i> 3rd edition (green cover), written by Christiane Simard.</p> <p>The chapters covered in this book are chapters 1 to 3:</p> <ul style="list-style-type: none"> - Descriptive statistics - Probability (terminology, basic properties, and combinatorial analysis) - Probability distributions (binomial distribution, Poisson distribution, normal distribution) <p>Some of chapter 4 could also be covered.</p> <p>Some additional notes and slides written directly by your professor will also be posted online and will form the continuation of the course. These will cover so-called "mathematical" statistics, including:</p> <ul style="list-style-type: none"> - Study of the fundamental mathematical properties of random variables (distribution function, density, expectation, variance, exponential distribution) - Two-dimensional discrete variables
<p>Bibliography</p>	<ul style="list-style-type: none"> - "Notions de statistique", 3ème édition (couverture verte), ouvrage rédigé par Christiane Simard <= la principale référence du cours - Comte M. et J. Gaden, Statistiques et Probabilités pour les sciences économiques et sociales, Collection Mayor, PUF, 1ère édition, 2000. - Wackerly D. D., Mendenhall W and R.L. Scheaffer, Mathematical Statistics with Applications, Duxbury Press, 7th ed., 2008. - Mendenhall W, Beaver R. J. and B. M. Beaver, Introduction to Probability and Statistics, Duxbury Press, 14 ed. 2012. - Ross S. M., Initiations aux Probabilités, traduction de la 4ème édition américaine, Collection : Enseignement des Mathématiques, Presses polytechniques et universitaires normandes. - Ross S., A first course in Probability, Pearson International Edition, 9th ed., 2013. ISBN-10: 1292024925. - Howell D. C., Statistique en Sciences Humaines (M. Rogier, traduction française), Edition Deboeck, 2008. <p>Il existe une panoplie de livres en français comme en anglais qui reprennent cette matière de base de la statistique et qui sont assortis d'exercices résolus ou non. Certains se trouvent à la bibliothèque ESPO de l'université. De plus, Internet regorge de cours de statistique, plus ou moins poussés, et de documents expliquant des concepts ou des chapitres de ce cours. Une série de vidéos sur YouTube issues de la chaîne "Chat Sceptique", permettent une approche aussi sérieuse que ludique de certains concepts statistiques. À certaines occasions, elles seront utilisées au cours-même.</p>
<p>Other infos</p>	<p>We strongly recommend that students acquire the course's reference book as soon as possible: <i>"Notions de statistique,"</i> 3rd edition (green cover), written by Christiane Simard.</p>
<p>Faculty or entity in charge</p>	<p>ESPB</p>

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Economics and Management	ECGB1BA	4		
Bachelor in Economics and Management (French-English)	ECAB1BA	4		
Bachelor in Economics and Management (French-Dutch-English)	ECTB1BA	4		