



4.00 credits	30.0 h + 22.5 h	Q2
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Teacher(s)	Heuchenne Cédric ;Uyttendaele Nathan (compensates Heuchenne Cédric) ;
Language :	French
Place of the course	Bruxelles Saint-Louis
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <ul style="list-style-type: none"> <li>• <b>understand</b> and <b>model</b> the randomness of certain phenomena</li> <li>• <b>correctly</b> model simple experiments (drawing from an urn with or without a discount) and <b>calculate</b> the probabilities of the events of interest</li> <li>• <b>apply</b> these basic models to real-life situations (gambling, insurance, calculating the profitability of a stock, etc.);</li> <li>• <b>describe</b> a random experiment using uni- and bi-variate random variables;</li> <li>• <b>use</b> discrete and continuous random variables to <b>calculate</b> probabilities in real problems;</li> <li>• <b>study</b> the properties of functions of random variables.</li> </ul>
Evaluation methods	<p>The evaluation will take place in June and August, in person via Moodle. 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.</p> <p>Such an evaluation not only tests the student's understanding of the course (comprehending its concepts, applying them in exercises, and interpreting results) but also requires the ability to go slightly 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 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 years' exams. Simply focusing</p>

<p>Teaching methods</p>	<p>Lectures and exercise sessions (practical sessions).</p> <p>The lectures and practical sessions (TPs) are held in person; both the course and the TPs will be complemented by potential Question/Answer sessions on Teams, and by the use of the Moodle platform, where students are required to enroll. Communications and instructions related to the course and TPs will be sent to students via announcements on Moodle.</p> <p>a) The lecture provides a systematic introduction to the theoretical and methodological foundations of probability theory and its probabilistic reasoning. In addition to intuitive explanations of the material, the lecture emphasizes formalized concepts and manipulations that allow for a rigorous understanding of probability theory. It is accompanied by concrete examples, particularly selected from the field of economics but also from areas of interest to management engineering students, aimed at illustrating and applying the theory. Throughout the course, a particular effort is made to involve students in the development and discovery of concepts useful for statistics and their applications. Active participation in the course should enable students to fully benefit from the practical sessions that complement the lecture and to immediately engage in a research-oriented approach.</p> <p>By the end of the course, students should be able to understand and model the random aspects of simple experiments and calculate the probabilities of resulting events. They should also be able to apply these models to more complex and real-world situations and describe these phenomena through appropriate random variables (univariate and multivariate). Additionally, they will be required to know the properties of functions of random variables and how these concepts apply directly to the framework of statistical analysis (sampling).</p> <p>This course opens the door to various other courses in the management engineering curriculum and prepares students for the quantitative methods necessary for their future projects and final theses. This course is particularly designed to prepare students for the Advanced Statistics course (INGE1231) and Econometrics (ECGE1330).</p> <p>b) The practical sessions are based on a collection of exercises, which largely includes exercises from the reference book (W.M.S.).</p> <p>c) Active participation in lectures and practical sessions, as well as participation in any Question/Answer sessions, is essential; success depends on it. Regular personal work (particularly understanding the course and finding solutions to the proposed exercises) must be done by the student from the first week of the course. It is absolutely essential that students get into the rhythm of the course and TPs from the start of the semester.</p> <p>Each student must therefore dedicate sufficient personal study time to ensure that they understand and master the material as it is covered, using their lecture notes, course videos, slides, the reference book (W.M.S.), and the educational resources related to the TPs. By the end of the semester, the period before the exam should not be a time of discovery, but a time of reviewing material that has already been understood and acquired.</p> <p>The expected personal work is in no way rote memorization. What will be evaluated in the exam is not the student's ability to recall information, but rather their in-depth understanding of the concepts and explanatory mechanisms, as well as their ability to use them appropriately, not forgetting the computational aspect.</p> <p>Other reference books, available at the University Library or online, are suggested to students as complementary resources for their more or less formalized approach and/or for their range of solved or unsolved exercises.</p>
<p>Content</p>	<p>This "Probability" course is based on an English reference textbook: D. Wackerly, W. Mendenhall, and R. Scheaffer,</p>



<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor : Business Engineering	<a href="#">INGB1BA</a>	4		
Bachelor : Business Engineering (French-English)	<a href="#">INAB1BA</a>	4		
Bachelor : Business Engineering (French-Dutch-English)	<a href="#">INTB1BA</a>	4		