



4.00 credits

30.0 h + 15.0 h

Q1

Teacher(s)	Bogaert Patrick ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	Préalabre : LBIR1110 <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>
Main themes	Introduction to the calculus of probability - Discrete and continuous random variables: probability and probability density functions, expectations, variance and other statistical properties - Principal statistical distributions - Couples of random variables and random vectors: joint, marginal and conditional distributions, independence, covariance and correlation, expectations and conditional variance - Introduction to statistics - Notions concerning estimators and estimator properties - Inference about the mean and variance: estimators, sample distributions - Notions of one-mean-confidence intervals.
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p>a. <u>Contribution of this activity to the learning outcomes referential :</u> 1.1, 2.1</p> <p>b. <u>Specific formulation of the learning outcomes for this activity</u> At the end of this activity, the student is able to :</p> <ul style="list-style-type: none"> <li>· Name, describe and explain the theoretical concepts underlying the probability theory;</li> <li>· Use the mathematical expressions in a formal way and by using rigorous notations in order to deduce new expressions or requested theoretical results;</li> </ul> <p>1</p> <ul style="list-style-type: none"> <li>· Translate mathematically textual statements using a rigorous mathematical and probabilistic framework by relying on appropriate concepts and theoretical tools;</li> <li>· Solve an applied problem by using a deductive approach that relies on a correct use of well identified properties and expressions;</li> <li>· Validate the internal consistency of the mathematical expressions and results based on theoretical properties and logical constraints that are induced by the probabilistic framework;</li> </ul>
Evaluation methods	Evaluation: Open book written examination (only with the original material). The examination is composed of exercises to be solved. Its duration is about 3 hours.
Teaching methods	Regular courses and supervised practical exercises
Content	Notion of event and probability - Major theorems of probability calculus. Discrete and continuous random variables: probability and probability density functions, expectations, variance and other statistical properties. Major univariate statistical distributions. Couples of random variables and random vectors: joint, marginal and conditional distributions, independence, covariance and correlation, expectations and conditional variance. Introduction to random numbers and their applications.
Inline resources	

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Environmental Science and Management	ENVI2M	4		
Interdisciplinary Advanced Master in Science and Management of the Environment and Sustainable Development	ENVI2MC	4		
Bachelor in Computer Science	SINF1BA	4		