# mqant1113

*2023*

# Statistics and Probability

| 5.00 credits | 45.0 h + 20.0 h | Q2 |
| --- | --- | --- |

| | |
| --- | --- |
| Teacher(s) | Vrins Frédéric ; |
| Language : | French |
| Place of the course | Mons |
| Main themes | • One-dimensional descriptive statistics: graphical representations, central tendency, dispersion.<br>• Two-dimensional descriptive statistics: joint distribution, covariance, linear correlation, linear regression, non-linear fits.<br>• Algebra of events and combinatorial analysis.<br>• Basic rules of probability calculation: probability axioms, conditional probabilities, Bayes formula, decision trees.<br>• Discrete and continuous random variables: density function, distribution function, mathematical expectation, variance.<br>• Studies of the main probability distributions: Bernoulli, binomial, Poisson, uniform, normal.<br>• Law of large numbers, central limit theorem, sampling. |
| Learning outcomes | **At the end of this learning unit, the student is able to :**<br><br>Given the « competencies referential » linked to the LSM Bachelor in Management and Business Engineering, this course mainly develops the following competencies:<br><br>• 1.1. Demonstrate the ability to reason independently and adopt a considered and critical approach to knowledge (academic and common sense).<br>• 2.3. Acquire a knowledge base in quantitative, IT and digital methods.<br>• 3.2. Apply clear and structured analytical reasoning, conceptual frameworks and science-based models to describe and analyse a simple but concrete problem and offer a solution.<br>• 3.4. Analyse and interpret results or proposals, and provide a well-argued critique, for a simple but concrete management problem.<br><br>1    At the end of the class, the student will be able to:<br><br>• represent a random experiment using the probabilistic model.<br>• demonstrate the basic properties associated with the concepts of probability, expectation, variance, covariance, ...<br>• assess the probability of an event occurring in a simple random experiment.<br>• calculate a series of indicators related to one or more random variables (expectation, variance, probability distribution, covariance, correlation).<br>• apply the central limit theorem to estimate a probability, confidence interval, maximum margin of error, or minimum sample size. |
| Bibliography | • Slides, syllabus et classeurs Excel<br><br>• TRIBOUT B (2013). Statistique pour economistes et gestionnaires, 2eme ed, Pearson<br>• WONNACOTT R., WONNACOTT R. (1995), Statistique, Economica, traduction de WONNACOTT R., WONNACOTT R. (1990) Introductory Statistics for Business and Economics, 4th ed., John Wiley & Sons. |
| Faculty or entity in charge | CLSM |

| Programmes containing this learning unit (UE) | | | | |
|---|---|---|---|---|
| Program title | Acronym | Credits | Prerequisite | Learning outcomes |
| Bachelor : Business Engineering | INGM1BA | 5 | | 🔍 |
| Bachelor in Management | GESM1BA | 5 | | 🔍 |