

## Content

| Course Code | Course Name | Semester | Theory | Practice | Lab | Credit | ECTS |
|-------------|-------------|----------|--------|----------|-----|--------|------|
| INF256      | Probability | 3        | 3      | 0        | 0   | 3      | 5    |

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|------------------------|--|
| Prerequisites          |  |
| Admission Requirements |  |

|                         |  |
|-------------------------|--|
| Language of Instruction | French   |
| Course Type             | Compulsory   |
| Course Level            | Bachelor Degree  |
| Objective               | Help students to perceive basic concepts related to probability and to achieve proficiency in using their methods (probabilities of events, rules for random variables and the concept of moment, important distributions, compound probability functions).  |
| Content                 | <ul style="list-style-type: none"><li>• The concept of probability, especially random variables in relation to uncertain events.</li><li>• Different probability distributions</li><li>• Probability theory in the problems they may encounter in the business world, especially in the analysis of uncertainty.</li><li>• Probability concepts in industrial applications</li></ul> |
| References              | <ul style="list-style-type: none"><li>• Sheldon M., Ross, M., Introduction to probability models, Academic Press, 2003, 8th Ed.</li><li>• İmdat Kara – Olasılık, Bilim Teknik Yayınevi – 2000.</li></ul>   |

## Theory Topics

| Week | Weekly Contents  |
|------|--|
| 1    | Introduction to probability, sets theory   |
| 2    | Conditional probability  |
| 3    | Total Probability Theorem, Inference and Bayes' Rule   |
| 4    | Independence, Conditional Independence   |
| 5    | Counting Principle, Combination, Permutation, Partition  |
| 6    | Discrete Random Variable: Introduction, probability mass function, special discrete random variables (Bernoulli, binomial, geometric, poisson) |
| 7    | Random Variable functions: Expected value, variance and standard deviation   |
| 8    | Midterm exam   |
| 9    | Joint probability mass function and conditionality of discrete random variables  |
| 10   | Independence of Discrete Random Variables  |
| 11   | Expected Value and Moments   |
| 12   | Introduction, continuous uniform random variable, probability density function, exponential random variable                                    |
| 13   | Cumulative distribution function, normal random variable and normal distribution   |
| 14   | Sürekli Rassal değişkenlerde koşulluluk ve bağımsızlık   |