

# Statistics

1. **Course number and name:** 020STAGS2 Statistics
2. **Credits and contact hours:** 4 ECTS credits, 2x1.25 hours
3. **Name(s) of instructor(s) or course coordinator(s):** Rafic FADDOUL
4. **Instructional Materials:**
  - a. Lecture notes.
  - b. Videos.
5. **Specific course information**
  - a. **Catalog description:** Sampling distribution - Estimation by confidence intervals, estimation by maximum likelihood, and estimation by the method of moments - Hypothesis tests for the mean, the variance, the proportion, independence and fitting to a distribution - Simple and multiple linear regression - Non-parametric tests.
  - b. **Prerequisites or co-requisites:** 020PRBNI4 Probability or 020AL3CI4 Algebra 3
  - c. **Required:** Required for all Civil Engineering students.
6. **Educational objectives for the course**
  - a. **Specific outcomes of instruction:**  
At the end of this course, the student will be able to:
    1. Estimate the parameters of a population from random samples.
    2. Validate a hypothesis using statistical tests.
    3. Conduct a simple and multiple linear regression and perform the corresponding tests."
  - b. **PI addressed by the course:**

<b>PI</b>	1.1	1.2	6.3	6.4
<b>Covered</b>	yes	yes	yes	yes
<b>Assessed</b>			yes	yes

7. **Brief list of topics to be covered:**

Lectures	Description
2	Review on random variables and probability densities
1	Difference between descriptive statistics and inferential statistics

1	Study of the sampling distribution
2	Confidence intervals for the mean
1	Confidence intervals for the variance
1	Confidence intervals for a proportion
2	Estimation by the method of maximum likelihood
1	Estimation by the moment method
2	Introduction to the concepts of statistical hypothesis tests
2	Hypothesis test for the mean
2	Hypothesis test for the variance
2	Hypothesis test for proportions
2	Hypothesis test for independence
2	Hypothesis test for conformity to a law
2	Linear regression
3	Introduction to non-parametric tests