



# Statistical and Computational Methods for Engineers

4-11-18-25, July, University of Rome "Niccolo' Cusano"

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Office Hours: TBD

**Course Description<sup>1</sup>:** The course aims to provide essential statistical and computational tools to research in Engineering and in Science. In particular the course will cover relevant statistical topics between others as multiple regression analysis, multivariate statistics, time series analysis and experimental design and data analysis. The emphasis is on application of the methods considered.

**Prerequisite(s):** None.

**Note(s):** A minimum grade of C is required in this course to progress.

**Credit Hours:** 8

**Text(s):** No single book is required. Readings will be assigned on each class.

**Course Objectives:**

At the completion of this course, students will be able to:

1. Defining a research project and the types of statistical analyses needed
2. Designing statistical experiments and simulation studies
3. Performing the statistical analysis of data
4. Writing efficient algorithms on R
5. Interpreting the statistical results obtained
6. Analysing the robustness and the sensitivity of the results obtained

**Grade Distribution:**

Labs	30%
Assignments	30%
Project	30%
Quizzes	10%

**Letter Grade Distribution:**

$\geq 93.00$	A	73.00 - 76.99	C
90.00 - 92.99	A-	70.00 - 72.99	C-
87.00 - 89.99	B+	67.00 - 69.99	D+
83.00 - 86.99	B	63.00 - 66.99	D
80.00 - 82.99	B-	60.00 - 62.99	D-
77.00 - 79.99	C+	$\leq 59.99$	F

<sup>1</sup>This syllabus template was created by: Brian R. Hall

## Course Policies:

- **General**

- Computers are not to be used unless instructed to do so.
- Quizzes and exams are closed book, closed notes.
- **No makeup quizzes or exams will be given.**

- **Grades**

- Grades in the **C** range represent performance that **meets expectations**; Grades in the **B** range represent performance that is **substantially better** than the expectations; Grades in the **A** range represent work that is **excellent**.

- **Labs and Assignments**

- Students are expected to work independently.
- **No late assignments will be accepted under any circumstances.**

- **Attendance and Absences**

- Attendance is expected and will be taken each class.

## Tentative Course Outline:

The weekly coverage might change as it depends on the progress of the class. However, you must keep up with the reading assignments.

<b>Week</b>	<b>Content</b>
4 July 9-10.30	• Simple Regression and Basic Programming on R
4 July 10.30-12	• Multiple Regression and Advanced Programming on R
11 July 9-10.30	• Multivariate Statistics I
11 July 10.30-12	• Multivariate Statistics II
18 July 9-10.30	• Time Series Analysis I
18 July 10.30-13	• Time Series Analysis II
25 July 9-10.30	• Optimization
25 July 10.30-12	• Design and Analysis of Experiments