UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Laboratorio Sas e R per la Biostatistica

2526-1-F8205B007

Learning objectives

The course aims to provide both theoretical and practical foundations for using SAS and R software in data management, statistical analysis, and report writing, particularly in the context of experimental and observational studies in the biomedical field.

Knowledge and understanding

This course will provide knowledge and understanding in the following areas:

- Basic principles of the SAS and R programming languages;
- Data management using SAS and R;
- Application of basic statistical methods using SAS and R.

Applying knowledge and understanding

By the end of the course, students will be able to:

- Manage databases using SAS and R;
- Implement basic statistical procedures to analyze data from clinical or epidemiological studies.

Contents

- Introduction to SAS and R software;
- Data management with SAS and R;
- Basic statistical analysis of biomedical data using SAS and R.

Detailed program

Introduction to SAS and R software

- Overview of the working environment
- Data importation
- Data step and proc step (SAS)
- Main procedures (SAS)
- Basic functions and packages (R)

Data management with SAS and R

- Data manipulation operations
- Date handling
- Dataset merging
- Creation of new and derived variables

Basic statistical analysis of biomedical data with SAS and R

- Univariate analysis of continuous and categorical variables
- T-test for group mean comparisons
- Chi-square test for comparison of proportions

Prerequisites

None

Teaching methods

Lectures will be delivered in two formats:

- Lecture-based: theoretical and practical concepts presented by the teachers;
- Interactive: hands-on lab activities in small groups using real datasets, followed by discussion and group correction of results with teachers.

The expected balance between lecture-based and interactive hours is approximately 1:1.

Assessment methods

Written exam.

The exam consists of two practical exercises involving the management and analysis of data from clinical or epidemiological studies, one to be completed using SAS, and the other using R.
The exam takes place in the computer lab and lasts two hours.
Use of the web and generative AI tools (e.g., ChatGPT, Gemini, etc.) is not permitted during the exam. However, students are allowed to consult materials provided during the course (code and slides), either in printed format or

electronically (via e-learning or USB drive).

There are no midterm exams.

The exam evaluates knowledge of SAS and R software and the ability to independently apply the acquired skills to solve practical biostatistical problems.

An optional oral exam is available upon student request.

The exam format is the same for attending and non-attending students.

Textbooks and Reading Materials

All materials distributed during the course: slides, book excerpts, articles, SAS and R code, datasets.

Semester

1st semester, 1st cycle

Teaching language

Italian

Sustainable Development Goals

QUALITY EDUCATION