UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Principles of Biostatistics

2223-3-E4102B073

Learning objectives

The aim of the course is to teach how to design an experimental or an observational study in the biomedical field, how to choose the proper statistical method in analyzing data and how to interpret the results.

Knowledge and understanding

This course will provide knowledge and understanding regarding:

- the identification, in the context of biomedical studies, of the nature of the outcome variables and of the factors potentially associated with the outcome

- the choice of the right statistical method according to the nature of the variables of interest and of the research question

Applying knowledge and understanding

At the end of the course the students will be able to:

- plan and perform the data analyses according to the nature of the variables of interest

- critically interpret and discuss the results

The course will provide a sound basis for choosing the right statistical methods as well for interpreting the results of the analyses in the context of the biomedical sciences.

Contents

1. Introduction to the course

2. Analysis of continuous responses

3. Analysis of categorical responses

4. Analysis of time-to-event (survival) data

Detailed program

1. Introduction to the course

1.1 The steps of the biomedical research and the role of the biostatistician

2. Analysis of continuous responses

2.1 T-test and analysis of variance

2.2 Assumptions

2.3 Non-parametric tests

2.4 Simple and multiple linear regression

3. Analysis of categorical responses

3.1 Analysis of contingency tables

3.2 Simple and multiple logistic regression

3.3 . Dose-response relationship

4. Analysis of time-to-event (survival) data

4.1 Time-to-event data

4.2 Non-parametric estimate of the survivor function (Kaplan-Meier method)

Prerequisites

None

Teaching methods

Lectures

Computer lab with applications in SAS

Assessment methods

Written test with optional oral exam.
The written test will be divided into two sections: the first will require to answer open-ended questions on topics covered in the course, while the second section will propose some exercises based on actual or simulated data to be solved while using the SAS software.
In the first part it will not be possible to consult any type of material, while in the second part it will be possible to consult both the web and all the material made available during the course, including the SAS codes.
The optional oral exam is only accessible to those who successfully complete the written test with a score of at least 18/30.
If the student decides to take the oral exam, passing the written test does not guarantee the passage of the exam.

Textbooks and Reading Materials

Martin Bland – An Introduction to Medical Statistics – Oxford University Press

Semester

Semester I, Cycle I

Teaching language

Italian

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING