

Mathematics and Modeling

Biostatistics 2: linear and non-parametric models

IDENTIFICATION

CODE : BS-4-S2-EC-BBBIOST
ECTS : 3.0

HOURS

Lectures :	12.0 h
Seminars :	22.0 h
Laboratory :	0.0 h
Project :	0.0 h
Teacher-student contact :	34.0 h
Personal work :	41.0 h
Total :	75.0 h

ASSESSMENT METHOD

2 x 1h 2 h

TEACHING AIDS

Photocopies of documents
On line PDF et PPT documents
Specialized softwares and web sites

TEACHING LANGUAGE

French

CONTACT

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AIMS

Being capable of analyzing data resulting from experiments in various domains and to model experimental situations to propose effective strategies of study. Be capable of adapting itself to more complex situations and of being able to work with experts.

The course presented in 3rd year is completed by an education realized in the form of steered works. He has to supply to the student the main methodological tools which will allow him[her] to treat the varied experimental results obtained in the diverse disciplines of life sciences. An introduction to the experimental design is also realized.

CONTENT

- 1) Introduction to the linear model 1: Linear regression to one or more variables.
Estimation of model parameters.
Forecasting, comparison of models.
- 2) Introduction to Linear Model 2: Analysis of Variance at One or More Controlled Factors
Fixed and random cross models. Notion of interaction. Multiple comparisons of means.
Simple experimental designs. Power of an analysis of variance. Introduction to the analysis of correlated data.
- 3) Introduction to non-parametric methods
Global comparison of distributions.
Test of homogeneous sequencing, of the median.
Rank tests (Wilcoxon) applied to averages
- 4) An introduction to the methodology of the plans of experiments (Taguchi method) will be discussed through a session of practical work and will be illustrated by the use of a catapult: choice of factors to reach a target with a given precision.

BIBLIOGRAPHY

- 1 - Statistique théorique et appliquée, vol. 1 et 2 - Dagnelie P. - De Boeck Université - 1998
- 2 - Pratique des statistiques non paramétriques - Sprent P. - INRA Editions - 1992
- 3 - Non parametric statistics - Conover W.J. - J. Wiley and Sons. N.Y. - 1980
- 4 - Méthodes statistiques en Sciences Humaines - Howell D.C. - De Boeck Université - 1998

PRE-REQUISITE

Module 32-BB-APPST or equivalent.