INSTITUT NATIONAL DES SCIENCES APPLIQUÉES LYON

DPT BIOSCIENCES
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Mathematics and Modeling

Biostatistics 3: The linear model

IDENTIFICATION

CODE : BS-3-S2-EC-BMSTAT3
ECTS : 3.0

HOURS

Lectures :	14.0 h
Seminars :	24.0 h
Laboratory :	0.0 h
Project :	0.0 h
Teacher-student contact :	38.0 h
Personal work :	37.0 h
Total :	75.0 h

ASSESSMENT METHOD

2 x2h

TEACHING AIDS

TEACHING LANGUAGE

French

CONTACT

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AIMS

At the conclusion of this module the student will have to be capable of analyzing biological data by using linear statistics.
The educational objectives of this module are to present the main concepts on statistical inference and their use to linear analysis of biological data.

CONTENT

Linear model: introduction to simple linear model (matrix and geometric approach)
- analysis of the 1 and 2 factors variance:
* Least square parameter estimates (assumptions and adjustment criteria)
* notion of contrast
* notion of interaction
- linear regression
* Least square parameter estimates (assumptions and adjustment criteria)
* trusted intervalues
* decomposition of variance
* linearity test (embossed models)
- Multiple regression and covariance analysis;
- Use of R for analyses and simulations
- nonlinear regression

BIBLIOGRAPHY

- Statistique théorique et appliquée. Inférence statistique à une et à deux dimensions, tome 2
- P. Dagnélie - De Boeck Université - 1998
- Biostatistical analysis - J.H. Zar - Prentice-Hall - 1998
- http://members.aol.com/johnp71/javastat.html

PRE-REQUISITE

Biostatistics (1)