ADVANCED STATISTICS

*(Coordinator and main Lecturer: **G. D. Costanzo**; Other Lecturers: **M. Marozzi** and **M. Zagoraou**)*

The course aims at introducing selected and advanced subjects in the field of Inferential Statistics and Linear Statistical Models. Main Course contents are:

a) The Bayesian Inference Statistical Analysis: prior and posterior distributions, parameters estimation, confidence interval, hypothesis testing. Bayesian computational methods: Markov Chain Monte Carlo method (students seminar activity).
b) Nonparametric methods for hypothesis testing: Rank and Permutation Methods with Applications in R; Cucconi's test and Spearman's rho; Kendal's tau and W.
c) General Linear Models: ANOVA (Analysis of Variance); MANOVA, ANCOVA, MANCOVA (students seminar activities).
d) Introduction to Generalized Linear Models: theoretical backgrounds

Final Assessment: The final grade will be determined by the scores on the class presentations and discussion (30%) given routinely, on a final assignment (30%) and on the final examination (40%).

Suggested Textbooks and Readings:

Hoff, P. L. (2009), *A First Course in Bayesian Statistical Methods*, Springer.

S. Bonnini, L. Corain, M. Marozzi, L. Salmaso: Nonparametric Hypothesis Testing: Rank and Permutation Methods with Applications in R. Wiley.

A. J. Dobson AN INTRODUCTION TO GENERALIZED LINEAR MODELS (Second edition) Chapman & Hall/CRC.