STRUTTURA	Scuola Politecnica
ANNO ACCADEMICO	2014/2015
CORSO DI LAUREA MAGISTRALE	**Scienze Statistiche (LM-82)**
INSEGNAMENTO	Statistical Modelling
TIPO DI ATTIVITÀ	Caratterizzante
AMBITO DISCIPLINARE	Statistico
CODICE INSEGNAMENTO	16438
ARTICOLAZIONE IN MODULI	No
SETTORI SCIENTIFICO DISCIPLINARI	SECS-S/01
DOCENTE RESPONSABILE	Gianfranco Lovison Professore ordinario Università di Palermo
CFU	10
NUMERO DI ORE RISERVATE ALLO STUDIO PERSONALE	178
NUMERO DI ORE RISERVATE ALLE ATTIVITÀ DIDATTICHE ASSISTITE	72 (48 LF + 24 Es/Lab)
PROPEDEUTICITÀ	----
ANNO DI CORSO	Primo
SEDE DI SVOLGIMENTO DELLE LEZIONI	Consultare il sito politecnica.unipa.it
ORGANIZZAZIONE DELLA DIDATTICA	Lezioni frontali, Esercitazioni in laboratorio informatico
MODALITÀ DI FREQUENZA	Facoltativa
METODI DI VALUTAZIONE	Prova finale scritta e orale
TIPO DI VALUTAZIONE	Voto in trentesimi
PERIODO DELLE LEZIONI	Primo semestre
CALENDARIO DELLE ATTIVITÀ DIDATTICHE	Consultare il sito politecnica.unipa.it
ORARIO DI RICEVIMENTO DEGLI STUDENTI	Consultare la pagine personale del docente

RISULTATI DI APPRENDIMENTO ATTESI

Conoscenza e capacità di comprensione

1. Knowledge of advanced methods of classical statistical inference.
2. Knowledge of basic methods of Bayesian inference.
3. Understanding of the theoretical justifications of methods and techniques learnt in previous courses.

Capacità di applicare conoscenza e comprensione

1. Ability to specify the statistical model with a critical approach, starting from the study objectives.
2. Ability to use in an integrated way the knowledge acquired in previous courses to deal with real application problems, including non-standard ones. 3. Ability to derive theoretical results in a formal way.

Autonomia di giudizio

1. Critical understanding of features, potentials and limitations of statistical models already known, and ability to enrich them with extensions and new features when needed.

Abilità comunicative

1. Ability to discuss the characteristics of a given inferential problem, both with other statisticians and with non statisticians.
2. Ability to write a scientific-technical report, focussed on the statistical model chosen to cope with a real problem.

Capacità d'apprendimento

1. Ability to use the advanced notions acquired in successive Statistics and Applied statistics courses and for the final thesis.
2. Ability to consult and understand the international statistical literature, in order to update knowledge and technical skills.

OBIETTIVI FORMATIVI DEL CORSO

This course aims at enriching the theoretical and applicative know-how of the student in the area of statistical modelling, discussing: 1) developments in the field of regression-type models (GLM and extensions); 2) some critical aspects of classical parametric inference; 3) the basics of Bayesian inference. The theoretical part, taught in the front classes, will be complemented from the applications point of view in laboratory tutorials, carried out in the R environment.

CORSO	**MODELLI STATISTICI**
ORE FRONTALI	**LEZIONI FRONTALI**
24	**Advancements in regression-type models** Generalized Linear Models and extensions
16	**Advancements in classical statistical modelling:** • origin and characterisation of statistical models; • complex dependence structures: interaction, joint effect, confounding; • advanced parametric inference: inference in the presence of nuisance parameters, extensions of the standard likelihood function; sufficiency and ancillarity;
8	**Introduction to Bayesian inference.** Bayes theorem. Prior and posterior distributions; the role of likelihood. Eliciting the prior: conjugate and flat prior distributions. Bayesian point and interval estimation. Assessment of hypotheses: Bayes factor. Computational aspects.
	LABORATORIO
12	**Advancements in regression-type models:** laboratory tutorials with R**.**
8	**Advancements in classical statistical modelling:** laboratory tutorials with R**.**
4	**Introduction to Bayesian inference**: laboratory tutorials with R**.**.

TESTI CONSIGLIATI	*a) lecture notes;* *b) Pawitan, Y. (2001) In All Likelihood. Oxford Science Publications, Oxford (Chs. 1, 2, 3, 6, 9, 10,17)* *c) Hoff, P.D. (2009)- A First Course in Bayesian Statistical Methods. Springer, Dordrecht. (Chs. 1 to 5)*