UNIVERSITÀ
DEGLI STUDI DI TRIESTE

Dipartimento di scienze economiche,
aziendali, matematiche e statistiche
“Bruno de Finetti”

Bayesian Statistics

General informations

A.A. 2018/2019

Lecturers

Francesco Pauli

francesco.pauli@deams.units.it
Office hours
see website.

Tuesday 17-18:30
Thursday 17-18:30

Always check communications on department website (www.deams.units.it) for variations.

By appointment at other times.

Leonardo Egidi

legidi@units.it
Room 529, Via Tigor 22
(fifth floor)

Office hours
see website.

Thursday 11.15-13
(H2Bis, third floor)

By appointment at other times.

Gioia Di Credico

gioia.dicredico@deams.units.it

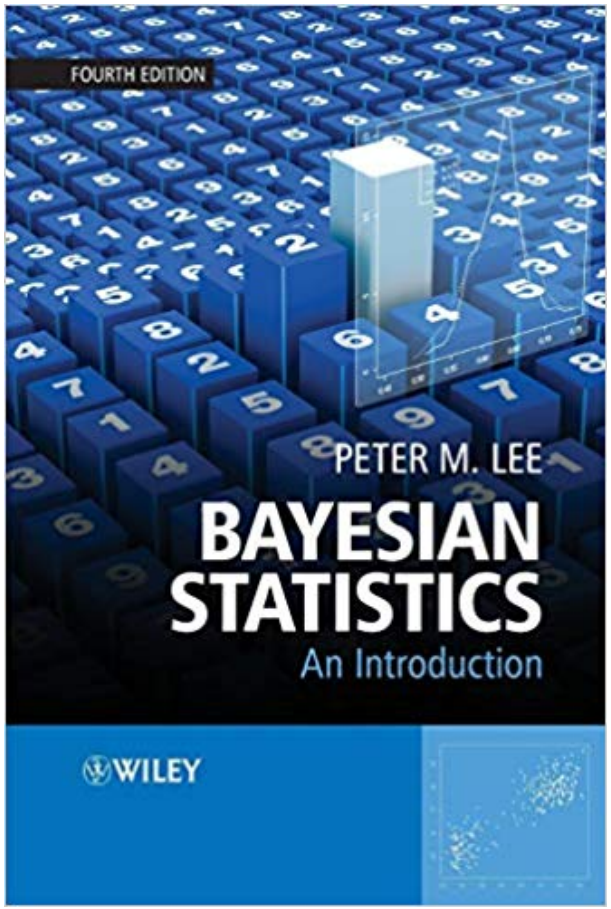
Lectures schedule

	Mon	Tue	Wed	Thu	Fri
9-11	Lecture			Lecture	
15-17					Lecture

No lecture on march, 8th; april, 5th; april, 26th

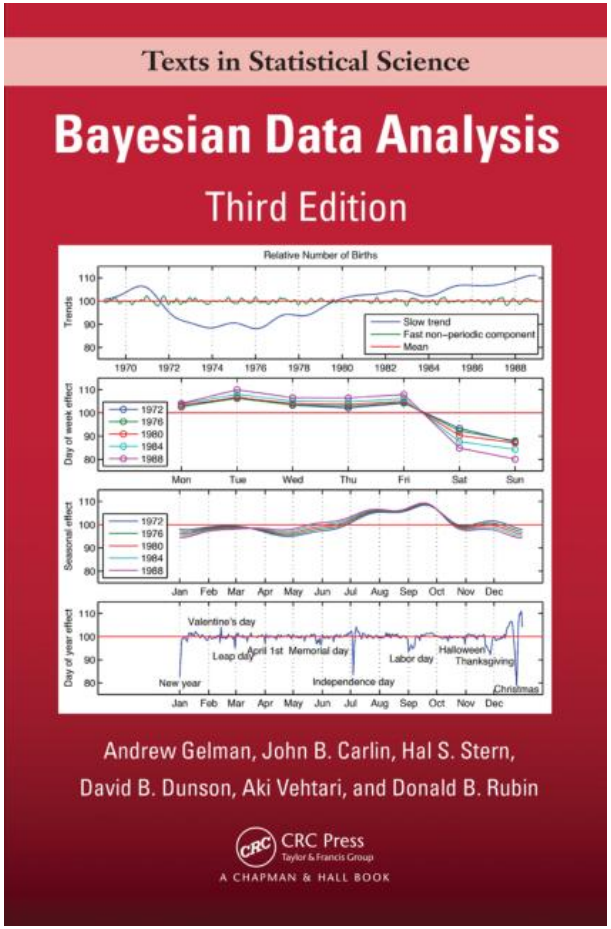
Textbook and reference books

Lee
Bayesian Statistics: an introduction
Wiley



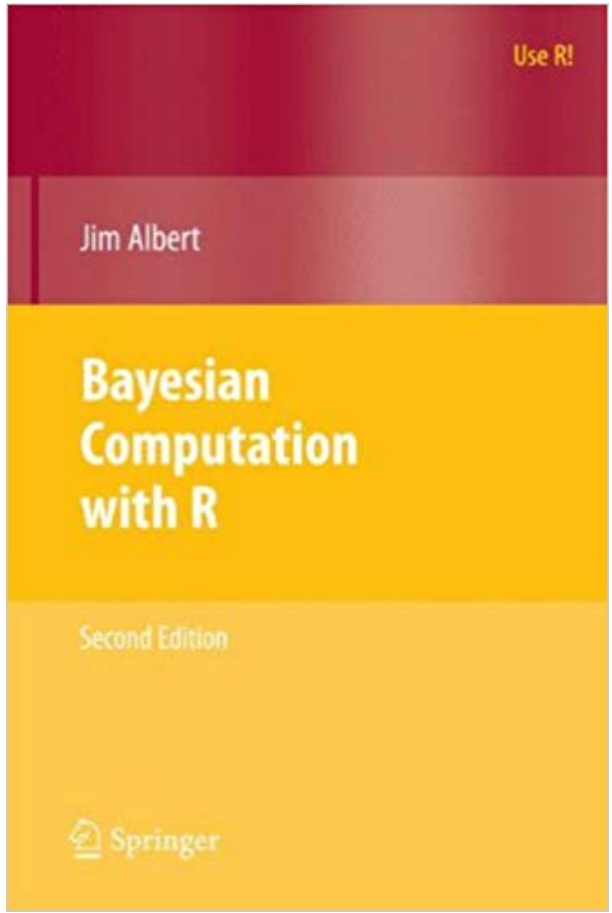
Textbook and reference books

Gelman, Carlin, Stern, Dunson, Vehtari, Rubin
Bayesian Data Analysis
CRC press



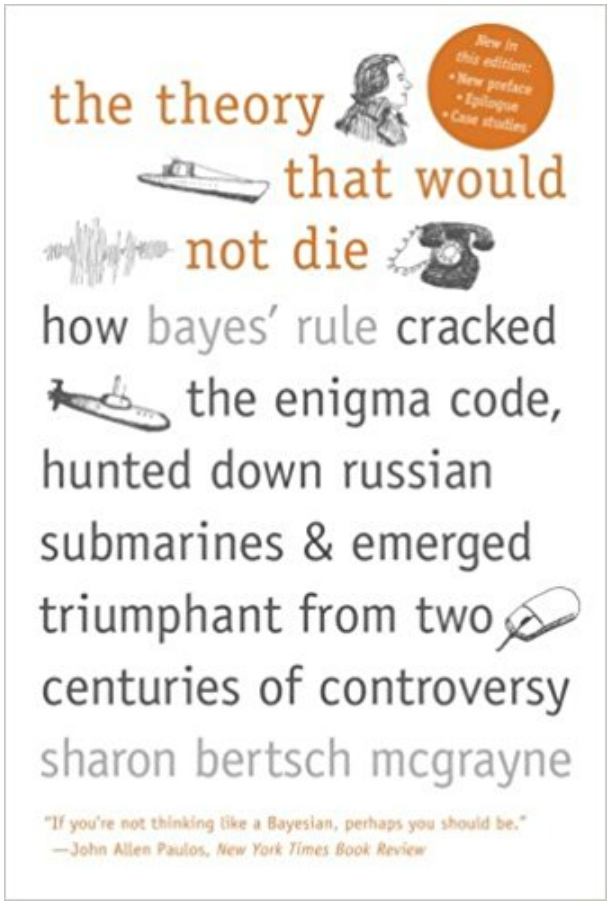
Textbook and reference books

Albert
Bayesian Computation with R
Springer



Additional readings

Sharon Bertsch Mcgrayne
The Theory That Would Not Die: How Bayes' Rule Cracked the Enigma Code
Yale University Press



Moodle

Course slides and additional material on moodle2.units.it

Moodle web-page will be used also to communicate variation in the lecture schedules.

Exam

Oral exam, discussion of a practical exercise and occasional homeworks.

- In the oral examination the student will have to prove knowledge of theoretical results illustrated in the course.
- The discussion of the practical exercise will serve the purpose of assessing his capacity of applying the methods taught in the course.
- Homeworks will be assigned approximately each couple of weeks to groups of three students. Homeworks have strict deadlines, and they may contribute for a maximum of 3/4 points to the final mark.

Syllabus

Aim

The student will understand the Bayesian inferential paradigm and its difference with respect to classical inferential paradigm. He will be able to specify and estimate a range of models within the Bayesian approach, assess the quality of the models and interpret the results.

- Introduction to Bayesian inference (with refresh of probability calculus and likelihood inference)
- Single parameter models: binomial, normal, Poisson
- Bayesian estimate, credibility interval (HPD)
- Predictive distribution (PPP), exchangeability
- Non informative/ weak informative / reference prior
- Multiparameter models: multivariate normal, known and unknown variance

Syllabus (continua)

- Asymptotic approximation (parallel with classical inference)
- Hierarchical models
- Regression model
- MCMC general introduction (Gibbs-Metropolis)
- Programming an MCMC algorithm in R
- Introduction to Stan and use of Stan for estimation.
- Optional: sketch of other approximation methods (Laplace, INLA); model selection and averaging