

COURSE TITLE - INTITULE DU COURS

Course title - Intitulé du cours	Analyse des valeurs extrêmes
Level / Semester - Niveau /semestre	M2 S2
Teacher - Enseignant responsable	Mathieu Ribatet
Other teacher(s) - Autre(s) enseignant(s)	
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Other teacher(s) - Autre(s) enseignant(s)	
Lecture Hours - Volume Horaire CM	22h
TA Hours - Volume horaire TD	
TP Hours - Volume horaire TP	
Course Language - Langue du cours	
TA and/or TP Language - Langue des TD et/ou TP	

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

mathieu.ribatet@ec-nantes.fr

Course's Objectives - Objectifs du cours :

This course is an introduction to the extreme value theory which aims at modelling extreme or rare event. As an introduction we will focus on univariate extremes, and depending on the timing, we may consider extension to the spatial setting.

The outline of the course is as follows:

- Motivation for the extreme value theory
- Block maxima approach: convergence to type theorem, von Mises conditions, penultimate approximation
- Statistical modeling of block maxima
- Exceedances above a threshold: convergence to the Generalized Pareto distribution, relationship to the GEV distribution
- Point process approach
- Non stationary and stationary sequences for extremes

There will be labs session where students will apply the theory on various datasets using the R framework.

Prerequisites - Pré requis :

Basic notion of probability and statistics

Practical information about the sessions - Modalités pratiques de gestion du cours :

Grading system - Modalités d'évaluation :

Written exam.

Bibliography/references - Bibliographie/références :

An Introduction to Statistical Modelling of Extreme Values S. Coles Springer Series in Statistics. Springer Series in Statistics, London, 2001

Extreme value theory: an introduction L. {de Haan} and A. Fereira Springer Series in Operations Research and Financial Engineering, 2006

Modelling Extremal Events for Insurance and Finance P. Embrechts, C. Klüppelberg, and T. Mikosch Springer, New York, 1997

Session planning - Planification des séances :

Distance learning – Enseignement à distance :