

## Motivation

Do you want to learn how to extract objective information from complex databases?

In this master you will learn

- well developed methods and techniques for a wide range of data structures.
- prediction, adjustment and optimisation processes based on empirical evidence.
- modern statistical methodology, computational statistics and data analysis.
- the design, analysis and reporting of empirical research.
- to play an important role within your discipline.

The teachers are scientists from a wide variety of fields including biology, bio-informatics, economy and marketing, environmental and life sciences, engineering, mathematics and physics, psychology and social sciences ... .

## A Choice between two Majors

After two courses that provide an introduction to statistical thinking and to statistical computing, students choose between two majors.

### Major Statistical Science

This major

- offers a firm basis of statistical thinking and methodology
- focusses on understanding and applying statistical concepts
- bridges the gap between statistics and empirical sciences.

Students are trained in modern statistical methods with a strong emphasis on applications.

From a wide variety of elective courses students can compose a curriculum that fits their background and interests.

The lecturers are active researchers from different fields of applications, they are involved in projects with industry and society.

### Major Computational Statistics

This major

- offers a balance between statistical data analysis methods, data bases and programming skills.
- focusses on specific data analysis tasks
- bridges the gap between traditional software packages (e.g. SAS, R, ...) and modern programming languages (e.g. Python, Perl, ...).

These courses are particularly intended for students with good computer skills and with a good sense for algorithmic thinking.

## Trajectories

The Master of Statistical Data Analysis is an intensive program which strengthens hand-on data analysis experience through project assignments, many of which involve group work. For students with a full time or part time job, spreading the program over different years will therefore be required. For students with a full time job, we recommend spreading the program over 3 to 4 years.

In planning your curriculum, please note that the course Principles of Statistical Data Analysis is a prerequisite for all other courses and thus must be taken in the first year. The course Analysis of Continuous Data (Stat. Science track) or Statistical Modelling (Comp. Stat. track) is a prerequisite for many other courses, so that it is recommended to take this course in the first year. Please try to take compulsory courses as much as possible prior to elective courses; in particular, it is not allowed to take the course Statistical Inference (Stat. Science track) or Big Data Science (Comp. Stat. track) in the second (or later) years when elective courses are selected in the second semester of the first year.

Upon registration, you will be asked to submit your selection of courses for the current academic years (not the subsequent years) via the electronic Oasis system. After submitting your proposed course trajectory, we will notify you in due course regarding the appropriateness of the proposed track. Below, we give you some guidance regarding spreading the program over 2, 3 or 4 years.

#### Major Statistical Science

If you plan to spread the program over 2 years, then the following trajectory is recommended:

year	1 <sup>st</sup> semester	2 <sup>nd</sup> semester
year 1	Principles of Statistical Data Analysis	Statistical Inference
	Analysis of Continuous Data	Experimental Design (optional)
	Statistical Computing	Analysis of High Dimensional Data (optional)
year 2	Categorical Data Analysis	Max 2 optional courses
	Max 2 optional courses	Master dissertation

If you plan to spread the program over 3 years, then the following trajectory is recommended:

year	1 <sup>st</sup> semester	2 <sup>nd</sup> semester
year 1	Principles of Statistical Data Analysis	Statistical Inference
	Analysis of Continuous Data or statistical computing	Experimental Design (optional) or Analysis of High Dimensional Data (optional)
year 2	Categorical Data Analysis	Max 2 optional courses
	Statistical Computing (or Analysis of Continuous Data)	
year 3	Max 1 optional course	Max 1 optional course
		Master dissertation

If you plan to spread the program over 4 years, then the following trajectory is recommended:

year	1 <sup>st</sup> semester	2 <sup>nd</sup> semester
year 1	Principles of Statistical Data Analysis	Statistical Inference
	Analysis of Continuous Data or statistical computing	
year 2	Categorical Data Analysis	1 optional course
	Statistical Computing (or Analysis of Continuous Data)	
year 3	Max 2 optional courses	Max 2 optional courses
year 4		Master dissertation

#### Major Computational Statistics

If you plan to spread the program over 2 years, then the following trajectory is recommended:

year	1 <sup>st</sup> semester	2 <sup>nd</sup> semester
year 1	Principles of Statistical Data Analysis	Big Data Science
	Statistical Modelling	Max 2 optional courses
	Statistical Computing	
year 2	Programming and Algorithms	Max 1 optional course
	Databases	Master dissertation

If you plan to spread the program over 3 years, then the following trajectory is recommended:

year	1 <sup>st</sup> semester	2 <sup>nd</sup> semester
year 1	Principles of Statistical Data Analysis	1 optional course
	Statistical Modelling or Statistical Computing	
year 2	Statistical Computing or Statistical Modelling	Big Data Science
	Programming and Algorithms	
year 3	Databases	1 optional course
		Master dissertation

If you plan to spread the program over 4 years, then the following trajectory is recommended:

year	1 <sup>st</sup> semester	2 <sup>nd</sup> semester
year 1	Principles of Statistical Data Analysis	1 optional course
	Statistical Modelling or Statistical Computing	
year 2	Statistical Modelling or Statistical Computing	Big Data Science
	Programming and Algorithms	
year 3	Databases	1 optional course
year 4		Master dissertation

## Commitment

For almost every course, the students need to complete two (small) homework assignments and one (big) project assignment. Some of these assignments are group work (2 to 4 students). The assignments must be handed in as well written reports and sometimes results must be orally presented. One or two weeks after submission the students receive feedback. For the compulsory courses the deadlines are aligned so that students have about one deadline per week.

As a consequence of the many deadlines students must be permanently committed to their studies.

## Career perspectives

If you successfully finish the master program you have acquired an advanced level of statistical knowledge and data analytical skills.

You are trained to think critically, to be a creative problem solver, to work as an independent expert within a multidisciplinary team that designs, performs, analyses and reports about applied scientific research.

Practical problems can be handled in an objective scientific manner, while you obtain insight in the structure of data and the underlying model.

You are stimulated to continuously extend your knowledge and insights concerning computational skills, flexibility, efficiency.

Through the multidisciplinary approach and the elective courses you are able to give extensive expertise in a specific field of study such as biostatistics, behavioral sciences, economics or biotechnology-genetics.

## International mobility

To make our program visible in an international environment of research and education, we encourage the exchange of teachers and students.

The international dimension of the training is obtained through:

- International experts that are invited every year to teach advanced courses as visiting professors.
- Teaching in English which allows foreign students to participate.
- The acknowledgement of credits acquired for equivalent subjects in a foreign institute, and the acknowledgement of our own credits by other institutes.
- The exchange of our own teachers with other institutes (including the London School of Hygiene and Tropical Medicine, Harvard, Stanford, the University of Wollongong)