Biostatistics is driven by a strong interaction between problems from biomedical research and rigorous mathematical analysis. Graduates of the program are able to master complex data challenges in topical research domains such as environmental and infectious disease epidemiology, personalized and evidence-based medicine and molecular life sciences.
**BIOSTATISTICS**

Biostatistics is driven by a strong interaction between problems from biomedical research and rigorous mathematical analysis. Complex scientific challenges require the development of new and appropriate statistical methods. Currently such challenges emerge, for example, in environmental and infectious disease epidemiology, personalized and evidence-based medicine and molecular life sciences, especially genomics, proteomics, epigenomics.

**PROGRAM OVERVIEW**

The Master Program in Biostatistics is a specialized Master program, hence it is a useful and direct continuation of a bachelor degree in all fields that include quantitative aspects, e.g. mathematics, physics, biology, computer science, etc. Students from all disciplines with a pronounced affinity to quantitative techniques and interest in acquiring state-of-the-art problem solving skills for research in the life sciences are invited to apply.

The program is based on the cooperation between the Institute of Mathematics of the Faculty of Science and the Department of Biostatistics of the Epidemiology, Biostatistics and Prevention Institute of the Faculty of Medicine. This broad basis allows to offer an education which provides graduates besides a classical training in biostatistics with a vast perspective on statistical approaches and challenges in the life sciences. It is the only – to date – specialized program for the training of biostatisticians in Switzerland. The entire program is taught in English.

**CAREER OUTLOOKS**

Career outlooks for biostatisticians are generally excellent, as for statisticians and professionals with quantitative skills in general. Graduates of the program will be highly qualified for a specialized occupation at universities or research institutes and in the pharmaceutical industry. Moreover, financial institutions, insurance and marketing companies, other corporations with research and development departments as well as consulting firms regularly seek to hire (bio)statisticians.

**PHD PROGRAM IN EPIDEMIOLOGY AND BIOSTATISTICS**

A Master’s degree in biostatistics allows to continue with doctoral studies in, e.g. biostatistics, epidemiology, bioinformatics etc. At the University of Zurich the Ph.D. program in Epidemiology and Biostatistics is closely linked to the Master Program in Biostatistics. It is part of the Life Science Zurich Graduate School offering a dynamic and stimulating international research environment. The overall goal is to train Ph.D. students with specialized skills in designing, conducting and analyzing studies in a biomedical research context.
CURRICULUM

The required 90 ECTS credits have to be gained from compulsory modules, elective modules in statistics/biostatistics, and elective modules in a field of science. In general it takes three semesters to complete the program.

Compulsory modules

The compulsory modules provide core knowledge and skills in modern biostatistics. The five compulsory courses contain theoretical foundations of biostatistics and their applications within biomedical research as well as a practical introduction to the specialized statistical methods in clinical research and epidemiology. The Statistical Consulting module offers in-depth insights into the statistical practice of a biostatistician. Students will work under supervision of an experienced biostatistician on real consulting problems from biomedical research. Together with the Biostatistics Journal Club the consulting project is a preparation for the Master’s thesis, which is an independent research activity and can, for example, be in the framework of an integrative project involving participants from other disciplines. It involves approximately a full-time 6-month workload and is concluded by a written report. The Master’s exam consists of an oral presentation of the Master’s thesis followed by questions from an expert audience including the supervisor. The student needs to show the ability to clearly present the relevance of the thesis and to defend it in view of critical questions.

Elective statistical modules

The elective statistical modules further extend the students’ knowledge of biostatistical (and statistical) methods. At least 16 ECTS credits have to be gained from courses like Bayesian Inference, Mixed Models for Correlated Data, Statistical Methods for Microarray and Short-Read Sequencing Data, etc.

Elective modules

Students have the possibility to freely choose appropriate modules from a field for which quantitative methods are meaningful, ideally in the medical or life sciences. The goal is to gain at least 6 ECTS Credits in view of acquiring background knowledge for the topic of the Master’s thesis.

Study plan and mentoring

Students together with the scientific coordinator compile a study plan outlining which modules they plan to take and update it every semester. A personal study plan is key to a successful participation in the program. The scientific coordinator mentors students, if they wish, with respect to choice of modules, overcoming difficulties with lectures or programming skills, the selection of a Master’s thesis topic etc.

<table>
<thead>
<tr>
<th>Modules</th>
<th>ECTS Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Likelihood Inference</td>
<td>5 ECTS</td>
</tr>
<tr>
<td>Generalized Regression</td>
<td>5 ECTS</td>
</tr>
<tr>
<td>Statistical Methods in Clinical Research</td>
<td>5 ECTS</td>
</tr>
<tr>
<td>Statistical Methods in Epidemiology</td>
<td>5 ECTS</td>
</tr>
<tr>
<td>Survival Analysis</td>
<td>3 ECTS</td>
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<tr>
<td>Biostatistics Journal Club</td>
<td>4 ECTS</td>
</tr>
<tr>
<td>Statistical Consulting</td>
<td>6 ECTS</td>
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<tr>
<td>Master’s Thesis</td>
<td>30 ECTS</td>
</tr>
<tr>
<td>Master’s Exam</td>
<td>5 ECTS</td>
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</tbody>
</table>
MORE INFORMATION

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