Medical Biometry/Biostatistics
Master
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Description of the Study Program

Biostatistics as a science of modelling and analysis of quantifiable biomedical processes and phenomena opens up a wide range of applications from prevention, treatment of environmental risks, consumer protection, health care, research and development, regulatory review and approval to health care reform. National and European laws and directives are creating a growing need. In order to meet this demand, the University of Bremen has established the international master's programme "Medical Biometry/Biostatistics". The aim of the course is to enable students to independently carry out scientific work in medical biometry, as for example the statistical planning and evaluation of empirical studies and the mathematical modelling of correlations in biology and medicine.

The program is offered each two years in English and deepens the basic knowledge of mathematics and statistics from the previous bachelor's program. It extends the knowledge and skills of the students especially in the field of medical research. It places emphasis on interdisciplinarity and practical relevance. A broad spectrum of knowledge for the professional profile of biostatisticians is acquired. Not only practical skills for planning and evaluating empirical studies are taught, but also methodological and medical basics as well as legal and ethical aspects. An internship is integrated, e.g. in institutes, companies, authorities or clinics, in which the students experience work situations and work requirements in a relevant professional field. Students are familiarised with the current state of research in methodology and application through these offers. Care is taken to ensure that students can exchange information, ideas and problems at a high scientific level in interdisciplinary teams and take responsibility for solutions.

In the courses on ethics and legal regulations, students deal in detail with the ethical aspects relevant to clinical studies. In addition, general aspects and backgrounds of ethical and legal content are discussed. This enables students to reflect on their tasks and to maintain or demand high ethical standards. In addition, personality development is promoted and a sensitisation to the civil society responsibility of one's own actions is achieved.
Admission Criteria and Requirements
The admission regulations specify the admission requirements and selection criteria of the master’s program. The information provided below is an excerpt of the admission regulations from 22.05.2019 and refers to winter semester 2020/21. Please recheck the current requirements as they are subject to change: www.uni-bremen.de/en/master

To be considered applicants need to provide:

- To have successfully completed university studies corresponding to an above-average Bachelor's degree with at least 180 credit points (CP) according to the European Credit Transfer System (ECTS) in a mathematical/scientific discipline (e.g. mathematics, statistics, computer science, physics, chemistry, biology) or medicine/health sciences/psychology.

- A minimum of 6 CP in mathematics, stochastics or statistics with a minimum mark of 2.5. Proof of relevant knowledge acquired in this field in the context of further education, preliminary studies or professional practice may be recognized or credited.

- English language skills at least equivalent to level C 1 of the Common European Framework of Reference for Languages (CEFR). Proof is also furnished if applicants have obtained their higher education entrance qualification or their last university degree in English. At the time of application, proof of English language proficiency must be provided that corresponds at least to level B 2 of the European Framework of Reference for Languages.

- A letter of motivation in English justifying the special interest in the course of studies.

Information on the required application documents (official certification, translation, health insurance, language certificates etc.) can be found at: www.uni-bremen.de/en/master/faq/

Expected Interests and Qualifications
Students should have a basic knowledge of mathematics, basic knowledge of statistics and an understanding of scientific methodology. Programming skills are desirable. A high interest in medical and biological aspects is expected.
In addition to the academic achievements, practical professional experience will also be included in the assessment process. As a requirement profile in terms of content, both basic knowledge of statistics and an interest in biomedical issues are in the foreground.

**Occupational Fields and Career Opportunities**

Excellent career opportunities are opened up for graduates by the objective of the initiative (training of biostatisticians, in particular for clinical research) in a national and international environment in the following areas:

- Health authorities (e.g. European Medical Agency - EMA)
- Regulatory Offices
- Pharmaceutical industry
- Medical technology ventures
- Biotechnology research
- Medical faculties, University Hospitals and medical research facilities
- Epidemiology and Health Research Institutions

Pharmaceutical research is a classic field of application, but biotechnology and medical technology are becoming increasingly important. The Master of Science degree opens up an interesting occupational field with a high international demand for appropriately trained specialists, but also the opportunity for subsequent doctoral studies. Therefore, the master's programme gives holders of a foreign Bachelor's degree the opportunity to qualify for a doctorate at a German university. The Master of Science also makes it easier for German students to gain a doctorate at foreign institutes and universities.
Curriculum and Contents of Program

Curriculum

The curriculum is based on a concept proposed by a working group of the German Region of the International Biometric Society (IBS-DR) and the German Society for Medical Informatics, Biometry and Epidemiology (GMDS) and was originally developed in cooperation with the Ruprecht-Karls-Universität Heidelberg.

The MA thesis is worth 30 credit points. The annual credits to be collected are 60 credit points.

Contents

The course is divided into two module areas, which are devoted to biometric methodology on the one hand and applications in medicine on the other. Students study in three semesters, the 4th semester is mainly dedicated to their master thesis. After the 2nd semester, an obligatory internship is scheduled (module area C). There is an elective range, which makes an individual rounding off and addition possible.

In the 4th semester the students write their final thesis (master thesis), a presentation of the master thesis is part of the colloquium.

Biometric and medical aspects learned as well as practical experience should be included in the master's thesis, e.g. through collaboration in the evaluation of a concrete clinical or epidemiological study and the processing and further development of methodological aspects that play an important role.

The course is a full-time study. Elective courses can be attended flexibly in the time configuration as a supplement and extension.
In module area A, methodical and practical basics of biometrics are taught and in internal internships their practical implementation. The biometric methods are developed on a semester-by-semester basis up to complex and research-oriented approaches. An introduction to epidemiology is also included.

In module area B, the fields of application are developed. Here the medical aspects are dealt with, ranging from general overviews to the basics of the various medical disciplines. Clinical studies and their ethical and legal aspects are dealt with in detail.

**Major fields of study**

Focal points of the study programme are e.g.:

- Biometrical methods
- Clinical studies and study designs
- Statistical modelling
- Basics of epidemiology
- Special courses in medicine e.g. internal medicine, molecular medicine

**Internship**

In the internship, students should experience work situations and work requirements in a relevant professional field within or outside the university. They should learn to define and analyze the problems and tasks arising in each case on the basis of their professional qualifications acquired to date and to develop and implement possible solutions. Typical internship positions are offered in:

- Health authorities, regulatory agencies, etc.
- University research institutions
- Pharmaceutical industry
- Medical technology industry
- CROs (companies that specialize in the execution of clinical trials as service providers)

The internship lasts from 6 weeks (6 CP) and is carried out with the usual weekly working time in the internship institution (during the lecture-free period).
Typical Learning Formats
Teaching takes place in lectures, exercises, seminars and internships. In each case, particular emphasis is placed on the importance for the biometric professional practice.

Language of Instruction
The program is taught completely in English.

Semester Abroad
There is no mandatory semester abroad. However, semesters abroad are possible.

(Research) Cooperations
The training is carried out in Faculty 3 (Mathematics and Computer Science) of the University of Bremen in a cooperation between the Competence Center for Clinical Studies Bremen (KKSB) and the Leibniz Institute for Prevention Research and Epidemiology - BIPS GmbH with the participation of the Cooperation Center Medicine of the University of Bremen (KOM). The KKSB is a cooperation institution between the University of Bremen and the Klinikum Bremen-Mitte. It consists of two departments: the Biometry Department, which is part of Department 3 of the University of Bremen, and the Pharmacology Department of the Bremen-Mitte Clinic. The BIPS covers the entire cycle of epidemiological research. The methodologically oriented professorial positions of the Leibniz Institute for Prevention Research and Epidemiology - BIPS belong to Department 3 of the University of Bremen. The KOM was founded in 2004 and offers a framework for joint research activities between physicians of the Bremen clinics and scientists of the university. The center develops interdisciplinary teaching concepts for university education at all levels as well as for further education and training. It currently has about 100 members, about half each from the Bremen clinics and the university.
Start of the Study Program
The program is offered each two years.
The next start is in the winter semester 2020/21.

Lecture period winter semester 2020/21:
October 19 – February 5, 2021
Holidays: December 23 – January 5, 2021

Lecture period summer semester 2021:
April 12 - July 16, 2021

Duration of Study
The master's program is a two-year course, composed of four semesters and includes 120 CP.

Degree
Master of Science (M.Sc.)

Faculty
The course is offered by the Faculty 3 – Mathematics and Computer Science. Within the University of Bremen, the faculty is characterized by its great strength in research. The faculty’s research groups are very productive in their own right, but are also active in interdisciplinary research collaborations in all of the University's high-profile areas as well as in large collaborative projects.
The faculty is composed of 26 professors and lecturers.

Number of Students in the First Semester
Students: 16 (as of winter term 2018/19)

Fees and Accommodation
The semester fee will be approximately 380 Euro per semester. It includes the use of public transportation in Bremen and the region around. For current information see www.uni-bremen.de/en/semester-contribution

After fourteen semesters of study in an EU- or EEA-country or after reaching the age of 55, students have to pay an additional fee of 500 Euro. Information about the long-term tuition fees can be found at www.uni-bremen.de/tuition-fee
General information about the city of Bremen and rental accommodation can be found at www.bremen.de and www.uni-bremen.de/accommodation. Students moving to Bremen receive 150 Euro as a welcome gift.

For information on study finance and jobs see www.uni-bremen.de/student-finances

**Information for international students concerning visa, health insurance and finances** can be found at www.uni-bremen.de/studentstatus

**Admission and Application**

**Application closing dates (first semester and advanced)**

The international study programme is offered every 2 years in English. The next start is in the winter semester 2020/2021. The application closing date is April, 30th 2020.

The admission requirements for the master's programme in Bremen are set out in the admission regulations for the master's programme "Medical Biometry / Biostatistics" in Faculty 3 - Mathematics/Computer Science of the University of Bremen dated 22 May 2019. Admission requirements for the master's programme "Medical Biometry/Biostatistics" are:

- Successfully completed university studies corresponding to an above-average Bachelor's degree with at least 180 credit points (CP) according to the European Credit Transfer System (ECTS) in a mathematical/scientific discipline (e.g. mathematics, statistics, computer science, physics, chemistry, biology) or medicine/health sciences/psychology.

- A minimum of 6 CP in mathematics, stochastics or statistics with a minimum mark of 2.5. Proof of relevant knowledge acquired in this field in the context of further education, preliminary studies or professional practice may be recognized or credited.

- English language skills at least equivalent to level C 1 of the Common European Framework of Reference for Languages (CEFR). Proof is also furnished if applicants have obtained their higher education entrance qualification or their last university degree in English. At the time of application, proof of English language proficiency must be provided that corresponds at least to level B 2 of the European Framework of Reference for Languages.
• A letter of motivation in English justifying the special interest in the course of studies.

Students should have a basic knowledge of mathematics, basic knowledge of statistics and an understanding of scientific methodology. Programming skills are desirable. A high interest in medical and biological aspects is expected.

In addition to the academic achievements, practical professional experience will also be included in the assessment process. As a requirement profile in terms of content, both basic knowledge of statistics and an interest in biomedical issues are in the foreground.

**Application closing dates (first semester and advanced)**

Winter semester: April 30 (for first semester and advanced)
Summer semester: January 15 (only for advanced)

**Applying as advanced student**

An application as advanced master’s student is possible for applicants who have either already gained their bachelor’s degree, or who can show by means of an official Transcript of Records that they only need 15 CPs before obtaining their bachelor’s degree. In addition to this, applicants must have gained at least 10 CPs in advanced courses relevant to the master’s program in question.

Any additional deadlines or closing dates for submitting required documents will be notified together with confirmation of admission/registration.

**Applications are to be submitted online at:**

[www.uni-bremen.de/en/master](http://www.uni-bremen.de/en/master)

Applications are to be submitted online via the Master Portal of the Admission Office under [www.uni-bremen.de/en/master](http://www.uni-bremen.de/en/master). The online application form is activated about 8 weeks before the application deadline. You will be notified of all required documents for enrollment together with the confirmation of admission/registration.
Student Office

Contact point for all formalities regarding admission and enrollment, re-registration, leave of absence, change of address.

Visiting address: Bibliothekstraße 1, Verwaltungsgebäude (VWG),
Ground floor

Postal address: Universität Bremen
Sekretariat für Studierende
Postfach 33 04 40
28334 Bremen

phone: +49 421 218-6002
master@uni-bremen.de
www.uni-bremen.de/en/master

Visiting hours: Mo, Tue & Thu 9–12 a.m., Wed 14–16 p.m.
(no advanced notification necessary)
Contact and Advisory Services

Internet address of the study program
www.uni-bremen.de/en/mscbiometry/

Consultancy for Study Affairs, Departmental Counseling and Internship Coordinator
Dr. Stephan Kloep
+49-421-218-63797
biostat@uni-bremen.de

University Services
www.uni-bremen.de/consultation

Service and Information for International Students
(accommodation, jobs, finances, language learning)
www.uni-bremen.de/offers-international-students

Information and Advice on Visa Matters and Social Security
www.inneremission-bremen.de/beratungen/internationale_studierende/
www.uni-bremen.de/bsu (see menu: Ausländerangelegenheiten)

Student Representatives for the Faculty
StugA Mathematik
Postfach 330 440
28334 Bremen
math@stugen.de

General Students' Committee (AStA)
Services include: Advice on BAföG student grants, social counseling, and childcare
AStA-Etage, Studentenhaus (StH)
www.asta.uni-bremen.de/asta-services/

02/2020 (Mo)
Zentrale Studienberatung

Besuchsadresse:
Bibliothekstr. 1, Verwaltungsgebäude VWG,
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28334 Bremen

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zsb@uni-bremen.de
www.zsb.uni-bremen.de

Beratungszeiten (ohne Voranmeldung):
Mo, Di & Do 9–12 Uhr
Mi 14–16 Uhr
Zusätzliche Termine für Berufstätige und Auswärtige
nach Vereinbarung