

Information Sheet for Incoming Students Biosciences

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TUM offers opportunities for international EXCHANGE STUDENTS (maximum of three semesters within the scope of an exchange program, like Erasmus+, TUMexchange or within a bilateral university agreement) as well as for international DEGREE STUDENTS (pursuing a BSc or MSc degree).

Contact for Exchange Students

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Our Study Courses in the Biosciences

Life Sciences Biology (B.Sc.)

The program covers a broad spectrum of fundamentals relating to the natural sciences, as well as all key subdisciplines in biology, in particular genetics, microbiology, ecology, plant sciences, zoology / animal science, and cross-disciplinary life sciences, such as biochemistry or bioinformatics. Interdisciplinary and comparative lectures (human and animal physiology, plant physiology, ecology) broaden students' knowledge and round out the program. Modern disciplines in biology, such as cell biology, bioinformatics, or biochemistry (lecture and internship) are the subject of required modules. Overarching themes such as evolution, genomics, or developmental genetics are covered in wide-ranging required modules during advanced semesters. Questions concerning social relevance and how to handle scientific findings are discussed extensively among groups of students together with university educators. Students are to complete a general education subject. In the 5th and 6th semesters, students can, in accordance to their own interests, select modules from a very extensive list and from at least 3 to 5 possible biological areas (genetics, microbiology, ecology, plant sciences, zoology / animal sciences, and cross-disciplinary life sciences –these modules account for around 20% of the entire program). In particular, students have the opportunity to complete advanced internships and research internships working within groups of scientists, or to participate in the excursions on offer. After six semesters, the program concludes with a research-oriented thesis completed over a three month period.

<i>Language of Instruction:</i>	German
<i>Standard Duration of Studies:</i>	6 semesters fulltime
<i>Credits</i>	180 ECTS

Biology (M.Sc.)

Specialization in focus areas (biochemistry and cell biology, genetics, medical biology, microbiology, ecology, plant sciences, zoology/animal sciences), with the option to develop a focus area into a primary focus. Around 200 modules in the life sciences and 65 professors enable students to tailor their studies to their own interests. As regards content, the modules offered correlate to one of seven focus areas: biochemistry and cell biology, genetics, medical biology, microbiology, ecology, plant sciences, zoology/animal sciences. Lectures, seminars, exercise modules, internships and excursions for students in advanced semesters build upon the qualifications obtained in previous studies (in a primarily life sciences-oriented degree program). These courses are largely research-oriented. Emphasis is placed on hands-on experience in small and very small groups, particularly as regards research internships within groups of scientists, where there is 1:1 supervision and the opportunity to make use of tools currently utilized in research. The program offers modules in zoology/animal sciences, such as animal neurophysiology, or biotechnology; modules in plant sciences, such as plant physiology, developmental genetics, stress resistance, molecular plant breeding and biodiversity; aquatic and terrestrial ecology, such as research diving or restoration ecology; microbiology modules concerning, for example, extremophile microorganisms, food biotechnology, or ecological microbiology; medical biology modules concerning inter alia virology, immunology, oncology or, in the area of biochemistry and cell biology, modules, such as protein design, molecular biotechnology and cell culture technology. The program concludes after 4 semesters (standard duration of study) with a research-oriented thesis completed over a six month period.

<i>Language of Instruction:</i>	German
<i>Standard Duration of Studies:</i>	4 semesters fulltime
<i>Credits</i>	120 ECTS

Molecular Biotechnology (B.Sc.)

The bachelor's program in Molecular Biotechnology is devoted to the production and construction of natural as well as artificial biomolecules. In addition, it combines the basics of natural science with content from biology, biochemistry, and biotechnology. Genetic engineering and further procedures also enable new biomolecules with improved or entirely new functions to be developed and produced. All of which plays an increasingly important role in medicine and also in technical areas such as environmental analysis or in biochips. Against this background, the degree course combines the methods of genetic engineering, protein chemistry, and biophysics with bioinformatics, in a single interdisciplinary approach.

<i>Language of Instruction:</i>	German
<i>Standard Duration of Studies:</i>	6 semesters fulltime
<i>Credits</i>	180 ECTS

Molecular Biotechnology (M.Sc.)

The master's program in Molecular Biotechnology is devoted to the production and construction of natural as well as artificial biomolecules. The program expands upon student's existing knowledge so as to advance their abilities concerning the discipline and its methods. New biotechnologies increasingly enable these molecules, which have important functions, to be artificially synthesized. Genetic engineering and further procedures also enable new biomolecules with improved or entirely new functions to be developed and produced. All of which plays an increasingly important role in medicine and also in technical areas such as environmental analysis or biochips. Against this background, the degree course combines the methods of genetic engineering, protein chemistry, and biophysics with bioinformatics, in one interdisciplinary approach. In addition, the master's program in Molecular Biotechnology expands upon students' previous knowledge by offering five specialties: biomolecules, cells, organisms, medicine, and technology.

<i>Language of Instruction:</i>	English
<i>Standard Duration of Studies:</i>	4 semesters fulltime
<i>Credits</i>	120 ECTS