technische universität
dortmund

STUDY THE FUTURE

Biopharmaceutical Engineering

bci

Biopharmaceutical Engineering

Biopharmaceuticals and cell products are among the most important growth areas in the pharmaceutical industry. The manufacturing of these products requires specific qualifications and extensive training. The master's program focuses on the interpretation of process data in order to improve the production of biopharmaceuticals. Students will learn how to design and operate complex pharmaceutical production systems using mathematical models and modern computer tools for simulation and optimization. Furtheron, they will also have mastered the methods of process development and monitoring as well as gathered knowledge of the regulatory requirements in drug production – from Good Manufacturing Practices (GMP) to the guidelines on serialization and anti-counterfeiting protection. The program is ideal for those seeking to enhance their qualifications and career prospects in biopharmaceutical engineering. The subject area of biomedicine and drug discovery is of the highest scientific, social and economic relevance and represents growth industries with great future potential.

The local scientific environment offers excellent conditions and opportunities to further advance this field, and as a result, Dortmund already enjoys strong national and international recognition. The network in and around the TU Dortmund University includes the Max-Planck-Institute for Molecular Physiology (MPI), the Leibniz-Institut für analytische Wissenschaften ISAS e.V., the CALEDO (Center for Advanced Liquid-Phase Engineering Dortmund), the BioMedicineCenter (BMZ), the Department of Chemistry and Chemical Biology (CCB) as well as the Department of Biology and Biotechnology of the Ruhr University of Bochum.

Career opportunities

Individuals who combine expertise in engineering and biotechnology are urgently sought in industry. Possible fields of employment include the planning, monitoring, control and evaluation of cell culture processes, the assurance of product quality (quality management) and the research and development of production and formulation processes. Graduates have excellent career prospects in the pharmaceutical industry and related sectors, such as the biotechnological industry, the food industry or the cosmetics industry. In addition, graduates with a master's degree in biopharmaceutical engineering are involved in the legal approval of manufacturing plants and processes.

Advance your engineering skills in Biopharmaceuticals.

Master process thinking and mammalian cell tech as you design industrial plants and optimize pharma workflows with expert support, integrating new tech and digital innovation.

Entry Requirements for foreign students

ACADEMIC PERFORMANCE

For admission to the Master's program in Biopharmaceutical Engineering, a Bachelor's (Undergraduate) Degree in Bioengineering, Chemical Engineering, Environmental Engineering, Life Science Engineering or a related discipline is necessary.

LANGUAGE TEST

Since the Biopharmaceutical Engineering stream of the Master's programme is exclusively taught in English, all applicants must provide an official language certificate (TOEFL or IELTS or Cambridge First Certificate).

Admission is based on your overall academic performance, recommendation letters, language certificate, motivational letter and further qualifications. For the evaluation of previously obtained bachelor courses applicants must show an excellent previous academic performance.

Application for English language masters programs

STUDENTS WITH AN INTERNATIONAL (NON-ECTS) BACHELOR'S DEGREE

Interested students meeting the criteria are encouraged to submit their application using the internet form. The deadline for the submission of the application for the following winter semester that starts in October, is May 15th.

Applications of international students are handled via the „uni-assist" platform and by the International Office of TU Dortmund University. Applicants have to make sure that all necessary documents are included and sent before the deadline as only complete applications will be processed. Questions that cannot be answered with the help of the relevant websites of TU Dortmund University may be sent to the provided contact emails.

APPLICATIONS OF STUDENTS WITH ECTS BACHELORS

Applications of students from Germany and from European universities which follow the ECTS credit point system are handled by the examination board ("Prüfungsausschuss").

YOUR APPLICATION HAS TO INCLUDE THE FOLLOWING DOCUMENTS:

- A copy of school-leaving certificate (A-level or secondary high school)
- A copy of university degree and transcript
- Official English language certificate (TOEFL or IELTS or Cambridge First Certificate)
- A Curriculum vitae including an actual photography
- A Motivational Letter
- Certificates for additional qualifications (as German language certificates, publications, etc.)
- Two letters of recommendation from senior chemical engineers who are familiar with your studies and capabilities, thereof at least one from a university professor

Financial matters

GENERAL

Living in Dortmund is affordable compared to many other cities in Europe. Students may expect a living cost of about € 940 per month including health insurance. This amount will pay for housing, living and some cultural expenses at a students‘ level as well as the administrative fee of around € 320 per semester.

Funding for the first semester should be secured before coming to Dortmund. There is only limited time to work besides your studies and your opportunities are restricted by the residence permit (“Aufenthalts-genehmigung”).

The International office at TU Dortmund University supports by providing advice, cultural and integration services for international degree-seeking students at all stages of their studies, from attracting international talent in admissions to helping them transition into the job market. After the first semester, there are job offers for student assistants (lab work, support for researchers and teaching activities).

HEALTH INSURANCE

For studying in Germany a health insurance is compulsory. German insurance companies offer health insurance for students at a special rate costing around € 100 per month; for students older than 30 years it may be a bit more expensive. The German health insurance offers an excellent service that is well worth the money.

SCHOLARSHIPS

Sufficient financial means are an important prerequisite for successful studies. There are several scholarships offered either by industrial sponsors or by the German government. For detailed information please contact your local German Embassy or Consulate or the scholarship data base of the German academic exchange service (DAAD).

Normally students will have to apply for a scholarship from their home country. They should be aware of the fact that the duration of processing a scholarship application can be up to one year.

Certain scholarships are also offered via TU Dortmund University for students with very good performance, but only during the higher semesters. Other opportunities, beside scholarships, after successfully completing the first semester are job offers for student assistants (lab work, support for researchers and teaching activities).

ACCOMODATION

Student accommodation is available either in dormitories located not too far from the campus or in other public student houses that are spread around the city. It is common for students in Germany to live in private accommodation, often in flat sharing communities, which are widely available.

Regulations

The program starts in October with a preparatory semester for students having passed an ECTS Bachelor‘s program of less than 7 semesters or a non-ECTS (European Credit Transfer System) Bachelor‘s program.

Only after successful completion of the preparatory semester by the end of the following summer semester, students are admitted to continue Master‘s studies in the next semesters.

All courses are taught in English. The numbers in the table indicate the credit points of the modules. One full semester corresponds to 30 credit points. The group project is compulsory for students who have not done a group design project (capstone project) during their Bachelor studies. Otherwise, it can be replaced by the same number of credits from elective courses. The M.Sc. in Biopharmaceutical Engineering is a two-year graduate program with a workload of 120 ECTS points.

Course Layout

Semester	1	2	3	4	Credits
Language Course	■				4
Thermodynamics for Pharmaceutical Systems	■				5
Particle Technology for Engineers	■				5
Cell and Tissue Reaction Engineering	■				6
Introduction to Process Dynamics and Control	■				5
Computer Science for Engineers	■				5
Drug Formulation Engineering		■			7
Process Analytical Technology		■			7
Technical Specialization Course 1		▭			5
Electives		○			11
Group Project			■		10
Conceptual Design			■		4
Technical Specialization Course 2			▭		5
Electives			○		11
Master Thesis				■	30

■ Compulsory modules
▭ Compulsory elective modules (2 out of 5)
○ Elective modules

Editor

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For more infos see:

Study
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