

Mechanical Engineering (B. Eng.)

Program of Study:	Mechanical Engineering (bachelor's program)
Department:	Mechanical Engineering
Degree Awarded:	Bachelor of Engineering (B.Eng)
Form of Study:	undergraduate study
Language of Teaching:	German
Commencement of Study:	Fall trimester
Standard Period of Study:	3 years, 3 months (10 trimesters)
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I) Program Description

The aim of the bachelor's program is to provide students with a solid undergraduate education that will prepare them for a demanding master's program or an entry-level position. This is accomplished through practice-oriented teaching on the basis of scientific knowledge and methods. Graduates of this program are able to work in the field of mechanical engineering in an independent manner. In the course of this program, scientific problem-solving methods are introduced; students thus gain the ability to think through problems in the field of engineering on their own. In addition, they learn to view their work from a social perspective, to recognize their responsibilities, and to adapt to rapidly changing developments.

II) Prerequisites

In order to take part in this program, candidates must hold a diploma that is recognized by the state of Bavaria as allowing them to study at a *Fachhochschule*. Candidates must also attend an eight-week technical seminar prior to the commencement of their studies. A solid basis in mathematics and the natural sciences is also required for the program. In particular, students should have a firm understanding of the following topics prior to beginning their studies:

- arithmetic and algebra: real numbers, exponents, square roots, logarithms, quadratic equations, linear equation systems with up to three variables, determining roots of functions, arithmetic and geometric series.
- analytic geometry and trigonometry: lines, circles, parabolae and hyperbolae, calculating right and acute triangles, trigonometric functions.
- differentials and integrals: derivation rules, limits, determining extreme values, points of inflection, curvature, integration.
- physics: movement and energy (movement of a body, force and mass, work and energy), fields (gravitational fields, electrical fields, magnetic fields/ induction), mechanical and electrical oscillations and waves, atomic structure and nuclear transformation.

We recommend that students review their high school coursework in mathematics and physics prior to the start of their studies.

In general, knowledge of foreign languages, especially English, is also an important requirement for a career in engineering.

III) Abilities & Tendencies

The most important requirement for a technical program of study such as mechanical engineering is an interest in technology. In addition, the ability to work under pressure, to keep the pace, and to think logically are all essential ingredients to success in this program. A thorough understanding of mathematics is also extremely helpful.

IV) Structure of the Program

The bachelor's program is divided into ten theory-oriented trimesters of three months each and practical periods totalling twenty weeks. The practical periods, including two weeks of practice-oriented seminars, are held during the semester breaks.

The first part of the program is dedicated to required modules focusing mainly on the theoretical foundations of the subject. Alongside the mathematical and scientific basis developed in their subject area, students are also exposed to prevalent issues in education and the social sciences by way of the interdisciplinary *studium plus* program. Developing working techniques such as planning, communicating, working in a team, and giving presentations is also crucial for students in this program. The first part of the program concludes with an internship. In the second part of the program, the general, theoretical foundations and scientific methods presented in the first part of the program are applied to the field of mechanical engineering. In order to better accommodate the interests of our students, the following areas of concentration are offered.

- transport systems
- energy and environmental technology
- safety engineering

Three months are set aside for the bachelor's thesis at the end of the program.

V) Careers

Thanks to their broad education and the variety of applications of their subject area, graduates of the bachelor's program in mechanical engineering are qualified for a wide array of careers in the armed forces and in the private sector. Whether in the army, air force, or marines, a good understanding of transport and weapons systems is extremely useful. A wide range of positions are thus open to officers with a degree in mechanical engineering. In the business world, projection, development, construction, production, and distribution are among the most important fields of activity. Typical industries in which our graduates pursue careers are the armament industry, the automobile industry, the aerospace industry, the marine industry, energy and environmental engineering, chemistry, the steel industry, precision mechanics, and optics. In the service sector, graduates may pursue careers as instructors, appraisers, or consultants. Surveillance organizations, classification societies, business and engineering consultancies, and insurance companies are just a few examples of organizations who hire mechanical engineers. Graduates are also in demand in the public service sector, the federal ministry of defence, military agencies, and in federal, state, and communal administration. The job market is also very promising in the long term for mechanical engineers.

VI) Further Information

For more information on study at the Universität der Bundeswehr München and the application process, please visit www.unibw.de/studienberatung.