

## **Aerospace Engineering (B.Sc.)**

Program of Study:	Aerospace Engineering
Department:	Aerospace Engineering
Degree Awarded:	Bachelor of Science (B.Sc.)
Form of Study:	full-time undergraduate study on campus
Language of Teaching:	German
Commencement of Study:	Fall trimester
Standard Period of Study:	3 years
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### **I) Program Description**

The bachelor's program in Aerospace Engineering prepares students for application-, research-, and teaching-based careers in the field of aerospace engineering in particular, and mechanical engineering in general. It provides students with the skills they need to recognize, analyze, and solve problems relating to the field by applying scientific methods.

This program is interdisciplinary in nature: after completing the traditional coursework in engineering, students choose from further courses relating to the design and operation of aircrafts. Additional courses in aerospace engineering build on this foundation by addressing special physical features of space travel. Thus graduates of the Aerospace Engineering program gain an excellent comprehensive basis for their future careers. In the course of their studies, they acquire the skills needed to cope with multifaceted tasks in the field of aerospace engineering in an independent and responsible manner, while at the same time taking technical, economic, and ecological factors into consideration.

### **II) Prerequisites**

In order to succeed in the program of study "Aerospace Engineering", students must possess a thorough understanding of their high school coursework in the natural sciences, especially in mathematics and physics. Higher level high school courses in these subjects are helpful, but are not obligatory. In addition to their studies, students are also required to complete a lab course and an internship. The majority of scholarly literature in the various branches of engineering, and especially in the field of aerospace engineering, is published in English. A working knowledge of the English language is thus mandatory in this bachelor's program. Furthermore, all students are required to participate in an eight-week lab course prior to commencement of their studies.

### **III) Preparing for Study**

From the outset of the program, students should be proficient in all of the material presented in their high school mathematics and physics classes. We therefore recommend that students review this material prior to beginning their studies (e.g. with the help of *Grundkurs Mathematik für Ingenieure, Natur- und Wirtschaftswissenschaftler* by Kurt Marti & Detlef Gröger, published by Physica Verlag, 2004).

### **IV) Abilities & Tendencies**

Students of the bachelor's program in Aerospace Engineering should enjoy addressing technical issues, and they should be curious and open-minded with respect to technological innovations. Students who have reservations about technology in general and computer technology in particular will not succeed in this program of study. The ability to reason, the ability to visualize in three dimensions, and the ability to approach problems in an analytic way are all qualities which a successful engineer

must possess. Nowadays, teamwork is more important than ever. Thus communication skills and the ability to work in a team are also necessary in this program.

## V) Structure of the Program

Students enrolled in this program choose between two areas of concentration:

- Aerospace Engineering (AE)
- Mathematical Engineering (ME)

The area of concentration “Aerospace Engineering” corresponds to the traditional course of studies in this field: first, the necessary theoretical foundations in mathematics and physics are laid, and students are consequently introduced to basic skills and information relating to their particular field of engineering. The area of concentration “Mathematical Engineering” places more emphasis on the mathematical basis underlying the subject and its various applications in aerospace engineering and beyond. Graduates who participated in this area of concentration are particularly well-suited for tasks dealing with analysis and numeric simulation of various phenomena dealt with in the field of engineering.

The standard period of study for this bachelor’s program is 9 trimesters, however excellent students who choose the “intensive study” option can finish the program in 7 trimesters. The first 5 trimesters in the area of concentration “Aerospace Engineering” are designated for laying the necessary theoretical foundation in mathematics, physics, and engineering. In the final trimesters, students address issues that are specific to the field of aerospace engineering. In the area of concentration “Mathematical Engineering”, students hone their knowledge of mathematical theory and acquire skills that are also relevant to mechanical engineering, electrical engineering, and computer science. Both areas of concentration require students to complete an internship during the summer break.

The bachelor’s thesis at the conclusion of the program allows students to demonstrate their ability to analyze and solve relatively extensive problems independently. Three months are allotted for the bachelor’s thesis.

## VI) Careers

A wide variety of career opportunities are open to graduates of the bachelor’s program in Aerospace Engineering, for example

- In the national/ international aerospace industry
- with aircraft operators (e.g. airline corporations)
- as an air-traffic controller
- in relevant national agencies (e.g. the *Luffahrtbundesamt*, the German Federal Bureau of Aircraft Accidents Investigation, Federal Ministries of Transport and Defense, or the Federal Office of Defense Technology and Procurement)
- in European agencies (e.g. the European Space Agency or the European Organisation for the Safety of Air Navigation)

Graduates will also find a broad spectrum of career opportunities at Universities, Colleges of Applied Science (*Fachhochschulen*), and research centers (e.g. the German Aerospace Center or the *Fraunhofer-Gesellschaft*). Graduates of this program will also find job opportunities outside of aerospace industry, for example relating to automobiles, railway vehicles, or ship-building or other careers in the general field of mechanical engineering. Companies that deal with wind energy or medical technology should also be considered. Last but not least, software development corporations, computer retailers, and consulting companies also offer employment opportunities suitable for graduates of this program.

## VII) Further Information

For more information on study at the Universität der Bundeswehr München and the application process, please visit [www.unibw.de/studienberatung](http://www.unibw.de/studienberatung) . As a student at the Universität der Bundeswehr München, you can also complete a portion of your studies abroad. You will find information on our exchange programs and partner universities at [www.unibw.de/auslandsbuero](http://www.unibw.de/auslandsbuero) .