Major: AEROSPACE ENGINEERING
ECTS code: BASEe

Educational and qualification degrees: Bachelor

Forms of study: full-time

Duration of study:
In full-time education
4 years - for a bachelor's degree,

Graduation: with a diploma project in all forms and levels of education

Admission: The application is made by submitting candidate student documents and ranking in the specialty according to the regulations of the Technical University of Sofia

Access to further studies: Students can pursue master's studies in the same field or in another area of technical sciences.

Actuality:
Aerospace engineering is one of the most dynamically developing areas in modern science and technology. In the context of global technological transformations, growing needs for sustainable transport, security, navigation, communications and space exploration, this engineering field is gaining increasing importance both nationally and internationally.
The development of commercial and civil air transport, the growing number of space missions (including those involving private companies), as well as the global need for Earth observation and climate change, impose an urgent need for qualified specialists in the design, operation and maintenance of aviation and space systems.
The relevance of aerospace engineering is highlighted by the following key trends:

- The rapid development of the private space sector, led by companies such as SpaceX, Blue Origin, Virgin Galactic, etc., which revolutionized access to orbit and to the moon.
- The rise of unmanned aerial vehicles (drones) and the need for engineers capable of designing and operating autonomous aviation systems.
- Integration of artificial intelligence and machine learning in the management of aviation and space platforms.
- Sustainability and green technologies in aviation – development of electric and hydrogen aircraft, as well as more efficient engines.
- Building global satellite networks for communication, navigation and remote sensing (e.g. Starlink, Galileo).
- Growing need for defense aerospace technologies in connection with today's geopolitical challenges.

Against this backdrop, aerospace engineering combines fundamental scientific knowledge with innovative applications, preparing engineering personnel for the challenges of the future. It is not only a strategically important area for any highly developed economy, but also a key factor for technological sovereignty, scientific progress and sustainable development of society.

General characteristics of the training:
Aerospace engineering is engineering specifically related to aircraft, satellites, and spacecraft. It is a cutting-edge field of research with many exciting new inventions in development. The Aerospace Engineering degree program prepares engineers with broad and in-depth knowledge of aviation and space technology. It combines fundamental engineering disciplines with applied knowledge and practical skills necessary for the design, construction, testing, operation and maintenance of aircraft and systems, both in the atmosphere and in outer space.
The training is highly interdisciplinary, including components of mechanics, aerodynamics, thermodynamics, electronics, materials science, control and automation systems, information technology, as well as specialized knowledge in the field of satellite communications, navigation and satellite surveillance.

Main accents and directions in training:

- Theoretical training in fundamental sciences and engineering disciplines;
- Aerodynamics, flight theory, aircraft construction
- Engines and Power Systems in Aviation and Astronautics
- Control, navigation and communication systems
- Materials Science and Manufacturing Technologies

- Introduction to Drones and Satellite Systems
- Training in modern methods of design, modeling and simulation (CAD/CAE/CAM)
- Development of engineering projects, participation in laboratory exercises and experimental work;
- Acquisition of skills for analysis, diagnostics and optimization of aviation and space systems;
- Building teamwork abilities, solving complex technical problems and adapting to innovation.

Educational objectives:

- Formation of a broad technical culture and ability for interdisciplinary engineering analysis
- Preparation of students for participation in development and applied activities
- Encouraging independent work, team communication and an innovative approach to solving real technical problems
- Preparation for Master's programs in the same or related field

Professional realization:

Graduates of the program can realize themselves as:

- Aircraft design and maintenance engineers (aircraft, helicopters, drones);
- Experts in the development of space technologies and satellite systems;
- Consultants in the defense sector and industrial organizations;
- Researchers in scientific institutes and universities;
- Managers and engineers in aviation companies and space agencies (e.g. ESA, NASA).

International focus:

Aerospace training follows international standards and practices, providing opportunities to participate in exchange programs, internships, and joint projects with foreign universities and industry partners.

Educational and professional goals:

The purpose of the training in the specialty "Aerospace Engineering (in English)" corresponds to the mission, vision, values and development strategy of the Technical University of Sofia. The main educational goal of the specialty is to provide highly professional broad-profile training and in-depth knowledge in one of the most up-to-date and promising technical fields related to aerospace engineering. The specific goal of the specialty is for students to gain solid knowledge, skills, habits, attitudes and values for designing, constructing, testing and maintaining aerospace systems and processes.

Realization of graduates:

Graduates of the Bachelor of Engineering degree will have knowledge and skills to work in a variety of professional positions in state and government agencies, private financial institutions and other organizations and companies in Bulgaria and abroad. Bachelor of Aerospace Engineering (in English) are prepared to realize themselves as specialists, analysts and consultants in aerospace engineering, managers and administrators in the aviation and aerospace industries, as well as related repair and logistics processes and systems, as well as as researchers in research organizations and universities in the field of aerospace engineering. The training in the specialty provides great adaptability in a market environment, allowing maintaining the acquired knowledge and skills in accordance with the future development of digital technologies and artificial intelligence systems