

Degree Programme: Mechatronics and information technics

ECTS code: BMIg

Qualification awarded: BEng

Education forms: Full-time education.

Term of education: 4 years.

Final examination: A bachelor work

Admission requirements: According the general procedure established for the Technical University of Sofia. B2 language certificate or German entrance exam.

Access to further studies:

According to the cooperation agreement, students in the field of Business Informatics are sent for two semesters of study at our partner university – Karlsruher Institut für Technologien and for 4, or 6 months practice in German enterprises to receive a German Bachelor's Degree. Students can continue at higher educational levels - master's degree and later doctor degree.

Programme importance:

For 30 years, with the direct support of DAAD and in cooperation with 4 German Universities, at the German Faculty bachelors and masters are trained in two major specialties "General Mechanical Engineering", and "Computer Systems and Technologies", as well as masters in "Industrial Management" "And" Business Management "- all in German.

Based on the increasingly necessary interdisciplinary approach in the training of mechanical, electrical and computer engineers, our partners from (KIT) 4 years ago introduced the specialty "Mechatronics and Information Technology" (Mechatronik und Informationstechnik), using the available teaching staff in these areas. The interest in the new specialty was so great that the status of "numerus clausus" (admission limit) was introduced for it. Such and similar specialties are of great interest in Bulgaria, including in TU-Sofia, where it was introduced in the Ministry of Finance 10 years ago. All this proves its relevance not only in Europe but also in our country. Indicative in this respect is that one of the current priorities of the Ministry of Education and Science is the construction of 4 Centers of Excellence, one of which is Mechatronics and Clean Technologies.

General characteristics of the training:

A mechatronic system contains machine-structural elements, electronic elements in the form of control hardware, including sensors and actuators, control-control components with information processing and the corresponding software for description, control and management of the system. This holistic approach applies to both development and its technical application and therefore also offers graduates of this specialty a wide range of activities in their future careers. Graduates of technical specialties with interdisciplinary knowledge have been sought by the industry for years. The interdisciplinary training of Mechatronics students gives them a comprehensive knowledge of systems, in which Information Technology has an important and defining role. This determines the significant share of Information Technology in the specialty.

Mechatronics and Information Technology training provides a broad base of theoretical knowledge and practical skills for research, design and production activities aimed at the application of Mechatronics in mechanical engineering, energy, transport, communications, healthcare, chemical, defense, agriculture, financial case, etc.

In the first two years, mainly general engineering disciplines are studied, followed by special and specialized subjects. Most of the special subjects are elective, structured in modules, which allows students to determine the direction of their studies according to their individual interests.

Annually, depending on the number of students, training is provided in at least 2 or more different modules.

Educational and professional goals:

Successful graduates must:

- to be well acquainted with modern electronic, information and machine-building technologies and their application in engineering practice and to have knowledge and experience in production processes;
- to be able to creatively participate in the process of engineering design both in the conceptual and detailed level of developments;
- to have developed abilities to work in a team and to have a sense of the economic-managerial, social, legal and humanitarian aspects of the engineering profession.

Employment of the graduates:

Due to their interdisciplinary training and a broad base of theoretical knowledge and practical skills, graduates of the Business Informatics major will find a very good reception in public and private companies in Bulgaria and abroad.

Mechatronics are often coordinators and managers who guide specialists from different specialties involved in a project. Specialists in this specialty are offered opportunities for professional realization in the following areas:

- **Research:** Development of mathematical and physical methods and models. Development and testing of new products and improvement of known methods and products. In-depth knowledge of the basic sciences is a prerequisite for this.
- **Development activity:** Conception, calculation and construction of systems, devices and equipment in laboratories, engineering and design offices. Structuring programs for microcontrollers and microcomputers for intelligent components and systems or creating computer software to carry out activities in various fields.
- **Production:** Preparation of production, production, control and testing of mechatronic systems in the electronics industry.
- **Design:** System design and planning of mechatronic systems together with the customer and the factories until they are ready for construction.
- **Distribution:** Distribution of mechatronic products including customer consulting.
- **Operation:** Coordination of the activities for operation, maintenance and repair of mechatronic systems.
- **Installation:** Planning, coordination and control during construction and commissioning of mechatronic equipment, their delivery to the customer.
- **Monitoring:** For example, a safety engineer in an enterprise or activity in the technical and safety inspection bodies.

Testing Laboratories, Patents and Marketing are the other opportunities for professional realization of engineers in Mechatronics and Information Technology. Contacts with abroad or work abroad are often required. The profession of mechatronics and information technology engineer also offers many opportunities for your own business.