BYDGOSZCZ UNIVERSITY
OF SCIENCE AND TECHNOLOGY
Faculty of Telecommunications,
Computer Science and Electrical Engineering

Applied Computer Science

Characteristics of the field of study

Master's degree in information technology is a way to gain expert knowledge in the latest information technologies. The studies prepare students to work in many IT branches and to manage projects in a multicultural environment. Students expand their knowledge of the latest technologies and IT canons in the field of digital signal processing, advanced information systems, unmanned aircraft programming or artificial intelligence. This is an excellent course for all engineering or bachelor's degree graduates in technical sciences who wish to broaden their IT knowledge and acquire new competencies and skills necessary in the job market. Upon graduation, you will possess knowledge and skills in the creation and development of software in low- and high-level languages and scripting, algorithms and data structures, computer graphics, artificial intelligence, IT project management, mobile device programming and programming in Unix, Linux and Windows environments. In the master's program, you will gain knowledge in optimization along with skills in high-level, low-level, and scripting languages. You will learn to apply your knowledge of algorithms to solve problems in the area of wireless network design and device software.

Specializations

- **digital signal processing**

The students acquire knowledge in the processing, analysis and acquisition of digital images and sequential images. They acquire practical skills of signal frequency analysis, creating image and video recognition systems in industrial applications. In addition, students of this specialization learn about the application areas of computer graphics, virtual reality. They have the knowledge of HMI design.

- **IT systems**

The students acquire knowledge of computer network administration, sensor networks, algorithms and data mining, cybersecurity methods and cloud computing. In the course of master's studies the students acquire practical knowledge of access networks of Smart Grid communication systems, protection of critical infrastructure, counteracting attacks directed at data security. They get acquainted with decision support systems KDD (Knowledge Discovery in Databases) and models of parallel algorithms and cloud computing testing and performance.

- **biomedical computer science**

The students gain knowledge of biometric data acquisition and processing. They gain practical skills in modeling biomedical processes using various programming languages. In addition, the students of this specialization get acquainted with the methods of modeling and using biocommunication and telemonitoring protocols.

- **drone programming**

The specialization is addressed to persons interested in applications of computer science in the field of unmanned aviation. Graduates may take an external certification exam and obtain a certificate of competency issued by the Civil Aviation Office in the form of a VLOS operator's certificate, allowing the commercial use of drones.

Where and what kind of job awaits you?

After graduating from the MSc Applied Computer Science program, you will be prepared to work in programming teams using high-level, low-level and scripting languages; teams designing databases and processing multidimensional data; teams designing advanced information systems and specialized software (including drones). You will be prepared to work in the dynamically developing IT sector, and the skills and competencies gained during your Master's studies will enable you to work in teams developing new technologies. Employment opportunities will open up for you in the following industries: Autonomous Technologies and Unmanned Flying Systems - including autonomous vehicle software, property protection and traffic and air traffic control; Artificial Intelligence - including medical diagnosis support systems, network traffic anomaly detection, object recognition; Wireless Networks and Automation - including wireless control systems, motion detection monitoring, fault detection, sensor software; Smart City Military technology Environmental protection and safety - including monitoring of pollution status, pressure, smoke, noise, plant diseases; Industrial plants of various industries - including high-speed transmission of control and measurement data from hard-to-reach places; Survey, protection and monitoring of natural environment (e.g. monitoring of movements of various animal species); Supporting social networks and entertainment; Robotics; Network-centric systems; Vehicular communication (communication technologies: V2V - Vehicle-to-Vehicle, V2I - Vehicle-to-Infrastructure).

About the study program

The Department of Telecommunications, Informatics and Electrical Engineering, second degree studies in Applied Computer Science received, in the fifth edition of the competition, the certificate "STUDIA Z PRZYSZŁOŚCIĄ" and the Extraordinary Certificate "LAUR INNOWACJI". The faculty was awarded for "modern education concepts, innovation in teaching methods and techniques, the highest quality of implemented programs and compliance with the needs of the labor market and the social and economic environment. The Committee of Experts awarded majors and specializations properly adjusted to the expectations of external stakeholders of the university, the implementation of

which contributed to equipping graduates with knowledge, skills and competencies with a high level of practical utility." Thanks to this you have the CONFIDENCE that during your studies you will gain all the necessary competencies and knowledge to manage projects, lead your own IT team and become a specialist in the industry. Studying at the Faculty of Telecommunications, Informatics and Electrical Engineering will provide you with the knowledge to quickly become an IT specialist.

Specialization description

Computer science studies at the master's level meet the requirements of the job market and allow you to gain knowledge in a specific area. Within the major, you can pursue one of four specializations: digital signal processing, information systems, and biomedical informatics.