



FACULTY
OF INFORMATION
TECHNOLOGY
CTU IN PRAGUE

A GUIDE TO BACHELOR SPECIALIZATIONS

STUDY PROGRAM INFORMATICS



INFORMATION SECURITY / COMPUTER ENGINEERING

COMPUTER NETWORKS AND INTERNET / SOFTWARE ENGINEERING

COMPUTER SCIENCE / COMPUTER SYSTEMS AND VIRTUALIZATION

INFORMATION SECURITY



The specialization is **focused on teaching students the principles of information security** with regards to security risks threatening information technology. One of the aims of the specialization is to teach students about the virtual world of administration of computer systems. Graduates will be able **to protect computer systems and information** from unauthorized interventions and use. In the **Ethical Hacking Laboratory** students can apply theoretical knowledge on how to protect systems from attacks in practice.

WHAT WILL YOU LEARN?

- ▶ Look for **potential risks**
- ▶ Make computer systems and networks **secure**
- ▶ Design and administer **secure SW and HW** for ICT systems

COURSES

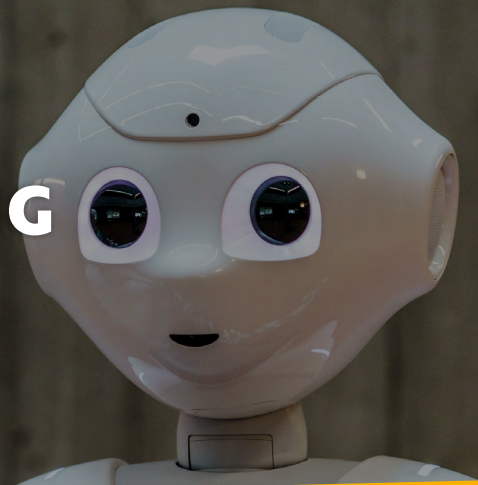
- ▶ Introduction to Cybersecurity
- ▶ Secure Code
- ▶ Hardware Security
- ▶ Ethical Hacking
- ▶ Applied Network Security
- ▶ Basics of System Security

JOBS YOU WILL BE ABLE TO DO

- ▶ Security analyst and architect
- ▶ Developer of secure software and hardware
- ▶ Forensic analyst
- ▶ Security technician in data centres and companies that provide computer infrastructure hosting

[HTTPS://FIT.CVUT.CZ/EN/BI-IB](https://fit.cvut.cz/en/bi-ib)

COMPUTER ENGINEERING



The specialization **focuses on the development of hardware and software, primarily for specialized embedded systems**. Students will also learn how to design, program and use reconfigurable computer systems, for example, to control robots, the intelligent home and the so-called Internet of Things. The students can work in several well-equipped laboratories, the latest edition being the **Laboratory of Embedded Intelligent Systems**, where they can work with modern humanoid robots.

WHAT WILL YOU LEARN?

- ▶ **Design hardware and software** primarily for embedded systems
- ▶ Work **with professional development tools** used in industrial practice
- ▶ **Use** all the different tools **in practice**

COURSES

- ▶ Embedded Systems
- ▶ Practical Digital Design
- ▶ Real-time systems
- ▶ Architectures of Computer Systems
- ▶ Computer Units
- ▶ Methods of interfacing peripheral devices

JOBS YOU WILL BE ABLE TO DO

- ▶ Embedded systems developer
- ▶ Digital hardware designer
- ▶ Verification engineer
- ▶ Designer of programmable and reconfigurable circuits resistant to faults and attacks

[HTTPS://FIT.CVUT.CZ/EN/BI-PI](https://fit.cvut.cz/en/bi-pi)

COMPUTER NETWORKS AND INTERNET

The specialization aims **to cover the whole area of computer networks** as well as to provide knowledge from related areas (data centres, IoT, 5G, etc.). During their studies, students will acquire extensive theoretical and practical experience with modern technologies in superbly equipped **Network Laboratory** and will be ready to enter the job market.

WHAT WILL YOU LEARN?

- ▶ Design, administrate, optimize, and **secure computer networks**
- ▶ **Program network applications** and understand distributed algorithms
- ▶ Understand network services and the **IoT and 5G mobile networks**

COURSES

- ▶ Architectures of Computer Systems
- ▶ Computer Networks Technologies
- ▶ Selected Topics in Computer Networking
- ▶ Internet of Things
- ▶ Administration of Computer Networks and Services
- ▶ Network Programming

JOBS YOU WILL BE ABLE TO DO

- ▶ Architect or administrator of computer networks
- ▶ Architect of Cybersecurity
- ▶ Developer of network applications
- ▶ Computer networks and IoT systems developer

[HTTPS://FIT.CVUT.CZ/EN/BI-PSI](https://fit.cvut.cz/en/bi-psi)

COMPUTER SYSTEMS AND VIRTUALIZATION

Computer systems belong among the most complex engineering works created by humans, and so far their size and performance has grown exponentially in accordance with the Moore's law. Graduates from this specialization acquire **knowledge at the level of architects and administrators of computer systems, networks, servers, data storages, and cloud computing systems**. They will be able to work in technology, consultant, and business positions in industry, public institutions, or state administration.

WHAT WILL YOU LEARN?

- ▶ Understand **modern architectures** of computer systems, servers, data storages, and cloud computing systems
- ▶ Use **virtualization techniques and tools**
- ▶ **Configure, scale, and virtualize** computer systems, tune their performance, ensure their system security, and high availability

COURSES

- ▶ Introduction to DevOps
- ▶ Architectures of Computer Systems
- ▶ Unix Administration
- ▶ Virtualization and Data Centers
- ▶ Web and Database Server Administration
- ▶ Basics of System Security

JOBS YOU WILL BE ABLE TO DO

- ▶ System engineer
- ▶ Administrator of computer and network infrastructure
- ▶ Technology consultant
- ▶ Architect or security analyst of computer systems

[HTTPS://FIT.CVUT.CZ/EN/BI-PSV](https://fit.cvut.cz/en/bi-psv)



SOFTWARE ENGINEERING

The specialization focuses on **methodologies and tools used during all stages of SW systems lifecycle**. Students will study conceptual modelling, implementation in specific languages and data repositories. Graduates will know how to code so that what you create remains functional and efficient for a long time. They will also practise **supervising SW projects and working in a team**.

WHAT WILL YOU LEARN?

- ▶ **Design** customized **software systems**
- ▶ Work in **different programming languages** and work with databases
- ▶ **Use collaborative tools** such as GIT, Track, JIRA, Redmine, and Jenkins

COURSES

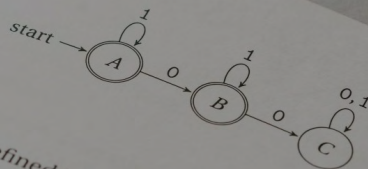
- ▶ Software Engineering
- ▶ Introduction to DevOps
- ▶ Conceptual Modelling
- ▶ Team Software Project 1 and 2
- ▶ Object-Oriented Programming
- ▶ Java Technology

JOBS YOU WILL BE ABLE TO DO

- ▶ Software developer
- ▶ User interface or data storage specialist
- ▶ Tester, administrator of configurations
- ▶ IT lecturer for companies and public administration

[HTTPS://FIT.CVUT.CZ/EN/BI-SI](https://fit.cvut.cz/en/bi-si)

COMPUTER SCIENCE



The specialization focuses on **basic and durable knowledge in computer science**. It provides high-quality education in the field of **efficient algorithms**. Students will understand the principles and laws of efficient algorithms with regard to the specifics of the architecture of computer systems. One of the aims of the specialization is to teach students the principles of using programming styles, implementation of programming languages and the basic **methods for data mining**.

WHAT WILL YOU LEARN?

- ▶ **Analyze algorithmic problems** and assess their complexity
- ▶ Create **efficient algorithms**
- ▶ Understand the principles and implementations of **high-level programming languages**

COURSES

- ▶ Linear Algebra 2
- ▶ Architectures of Computer Systems
- ▶ Programming Paradigms
- ▶ Algorithms and Graphs 2
- ▶ Programming Languages and Compilers
- ▶ Mathematical Logic

JOBS YOU WILL BE ABLE TO DO

- ▶ Problem-solving analyst or designer in development teams
- ▶ Programmer with knowledge of creating efficient algorithms
- ▶ Specialist for processing large volumes of data
- ▶ Specialist in algorithmic tasks in application areas

[HTTPS://FIT.CVUT.CZ/EN/BI-TI](https://fit.cvut.cz/en/bi-ti)



ABOUT THE FACULTY

FIT offers over **400 subjects in 10 bachelor and 9 master specializations (6 bachelor and 5 master specializations in English)**. High-quality research takes place in **18 modern laboratories** with high-tech equipment and is conducted by **13 research groups**. **FIT closely cooperates with the IT industry**, for which it has developed a partnership and sponsorship program.

Over the course of its history, FIT has produced more than **3,000 promising graduates**.

For **people interested in studying at FIT**, we organize interactive Open Doors Days twice a year as well as educational events and competitions throughout the year.

FIT holds specialized lectures, supports participation of students in national competitions and study stays at universities abroad.

Thanks to the practical focus of the studies, FIT CTU has 100% employability of graduates.



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