VSB TECHNICAL
UNIVERSITY
OF OSTRAVA

FACULTY
OF MINING
AND GEOLOGY

Geoinformatics

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Faculty	Faculty of Mining and Geology
Type of study	Follow-up Master
Language of instruction	English
Code of the programme	N0532A330044
Title of the programme	Geoinformatics
Regular period of the study	2 years
Coordinating department	Department of Geoinformatics
Coordinator	doc. Ing. Michal Kačmařík, Ph.D.
Key words	spatial data; spatial data analysis, Global Navigation Satellite Systems, Earth Observation; drones, geoinformation technologies, spatial database systems and geoweb

About study programme

We encounter geoinformatics every day, literally at every turn - whether it's navigation, weather forecasting, maps or gaming. During your studies, we'll teach you how to transform the world around you into a digital environment, fly drones, use state-of-the-art GPS devices, use artificial intelligence, and create 3D models. You will be able to process and analyse the results of your work, display them on maps and publish them on the internet. We will teach you not only how to work with modern applications, but also how to develop them. The study programme "Geoinformatics" prepares students not only in the fields of geoinformatics and computer science, but also does not forget about soft skills.

After graduation, you will have opened doors inlarge and small companies or public administration. You will find employment in positions such as web mapping application developer, data analyst, database specialist, or geodata collection and distribution expert. The most successful ones will also start their own companies.

Professions

- Developer of web map applications
- Geodata administrator
- Project manager
- Database systems specialist
- Cartographer
- Expert in the field of relief modeling and processes in hydrology
- Information systems administrator
- Specialist in science, research and development
- IT analyst
- GIS specialista
- Geoinformatics
- Geodata and metadata manager
- Expert officer in the departments of geoinformatics of municipalities and regional authorities
- Computer programmer
- Junior specialist for data analysis
- GIS analyst
- GIS application manager

- Data visualization specialist
- Expert in data collection and distribution
- Data scientist
- Programmer - specialist

Hard skills

- HTML, CSS
- Geographic information systems, geoinformatics and geoinformation technologies (GIS, GIT)
- Earth remote sensing, drones
- Object analysis
- Knowledge of English in written and spoken form
- Data processing in GIS, statistics (R, IBM SPSS)
- Satellite navigation systems - GNSS (GPS, Galileo)
- Object Oriented Technologies (UML)
- Creation of sensor networks
- Design and implementation of a data layer
- Algorithms and data structures
- Statistical data analysis
- Application programming
- Programming (Python)
- Analytical skills
- Website creation
- Modelling tools
- Modeling and simulation
- Python
- Physicak design of the database
- Project management
- 3D models and modeling
- Designing
- SW ArcGIS, QGIS
- SW MS Access
- R
- Object-oriented programming
- Data analysis
- GIT
- Knowledge of geographic information systems, geoinformatics, and geoinformation technologies (GIS, GIT)
- Knowledge of system approach
- Knowledge of statistical SW
- IBM SPSS
- Thematic cartography
- Development of web applications
- Digital image processing
- PostgreSQL
- SQL
- Web map applications (GeoWeb)
- Spatial data processing (acquisition, storage, processing, visualization, publication)
- Meteorology and navigation
- MS Office

- Databases, relational databases design, SQL
- Knowledge of web applications trends
- Knowledge of technical English

Study aims

With the continuous development of information technology, the amount of data that needs to be processed, analysed and interpreted for the broad needs of the human population is growing. These data often come from heterogeneous
sources and are localised in space and time. The labour market is therefore in continuous demand for skilled graduates who have a comprehensive knowledge of working with spatial data.
The study of the programme builds on the foundations acquired by studying the Bachelor's degree in Geoinformatics, or a related bachelor's programme.
The follow-up Master's degree in Geoinformatics focuses on teaching advanced processing and analysis of spatial and non-spatial data using conventional quantitative techniques and modern approaches based on artificial intelligence. Existing geoinformatics and other applications, or self-developed applications and scripts, are used to process this data, so graduates are able to provide automation and replicability of processes. In the process of data acquisition, storage and processing, they are also able to use spatial database systems, server technologies, web services or cloud services. The emphasis is put on the ability to apply a systematic approach to problem solving, self-interpretation of results and quality presentation of the produced outputs using advanced data visualization techniques. Students also develop their knowledge and skills in Earth observation, localization and navigation in space, modeling and simulations
or soft skills.
Graduates find employment in companies operating in most industries, especially in IT, environment related sectors, the financial sector, construction, transport and integrated rescue services. A number of graduates have also successfully started their own businesses.

Study curriculum

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