



Master's Program in Intelligent Data Analytics

Description

The rapid growth of digital technologies has transformed data into one of the world's most valuable strategic resources. From scientific discovery and industrial automation to finance, healthcare, and smart cities, organizations increasingly rely on data-driven methods to support innovation and informed decision-making. As Artificial Intelligence continues to evolve, the ability to collect, manage, analyze, and interpret complex data has become an essential professional skill.

The **Master's Program in Intelligent Data Analytics** equips students with the knowledge and practical expertise required to extract meaningful information from large and complex datasets and to develop intelligent systems based on modern Artificial Intelligence technologies. The program combines rigorous training in applied mathematics, statistics, computer science, and machine learning with hands-on experience using state-of-the-art analytical tools and programming environments.

Designed to meet the growing demand for highly qualified data professionals, the program provides an interdisciplinary education that bridges theoretical foundations with practical applications. Students learn not only how to build predictive models and intelligent algorithms, but also how to understand data, evaluate analytical results, and translate them into effective solutions for real-world problems.

Relevance to the Job Market

The global demand for specialists in data science and Artificial Intelligence continues to grow across virtually every economic sector. Organizations increasingly seek professionals capable of transforming raw data into valuable insights that improve business processes, support strategic decisions, and enable innovation.

Graduates of the program are prepared for careers in information technology, finance, telecommunications, healthcare, manufacturing, energy, public administration, research, and digital innovation. Typical career paths include **Data Scientist**, **Machine Learning Engineer**, **Data Analyst**, **Data Engineer**, **Business Intelligence Analyst**, and **Artificial Intelligence Specialist**.

The professional competencies developed within the program are closely aligned with the European Skills, Competences, Qualifications and Occupations (ESCO) profiles for **Data Scientist (2511.4)** and **Data Analyst (2511.3)**, ensuring strong relevance to the European labor market.



Competencies Acquired

Graduates will be able to:

- Design, implement, and evaluate machine learning and deep learning models for prediction, classification, clustering, and optimization.
- Analyze, visualize, and interpret structured and unstructured datasets using modern statistical and computational methods.
- Develop scalable data processing pipelines using Python and database technologies.
- Apply stochastic models, probabilistic reasoning, and Monte Carlo methods to complex engineering and scientific problems.
- Build intelligent systems for computer vision, natural language processing, and decision support.
- Select and evaluate appropriate analytical methodologies for solving real-world data-driven challenges.
- Communicate analytical findings effectively to both technical and non-technical audiences.
- Conduct independent scientific research and contribute to the development of innovative AI-based solutions.

Selected Courses

The curriculum includes advanced courses in:

- Mathematics for Machine Learning
- Data Analysis and Visualization
- Python Programming for Data Science
- Database Systems
- Machine Learning
- Automated Data Acquisition and Processing
- Stochastic Processes and Models
- Monte Carlo Methods
- Deep Learning and Neural Networks for Computer Vision
- Natural Language Processing
- Scientific Research Methodology



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Research Areas

Students have the opportunity to participate in research projects covering topics such as:

- Machine Learning and Deep Learning
- Data Mining and Knowledge Discovery
- Explainable and Trustworthy Artificial Intelligence
- Computer Vision
- Natural Language Processing
- Predictive Analytics and Forecasting
- Statistical Learning and Probabilistic Modeling
- Big Data Analytics
- Intelligent Decision Support Systems
- AI applications in science, engineering, healthcare, finance, and industry

Additional Information

- **Language of instruction:** Romanian
- **Duration:** 2 years (120 ECTS)
- **Degree awarded:** Master of Science (M.Sc.) in Applied Engineering Sciences
- **Contact person:** Cof.dr. Teodor ȚURCANU, teodor.turcanu@upb.ro
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