Study plan

Name of study plan: prg.ai Master

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Welcome page
Garantor of the study branch:
Program of study: Welcome page
Type of study: unknown full-time
Required credits: 90
Elective courses credits: 0
Sum of credits in the plan: 90
Note on the plan:

Name of the block: Compulsory courses in the program
Minimal number of credits of the block: 84
The role of the block: P

Code of the group: 2025_MPRGAIDIP
Name of the group: Diploma Thesis
Requirement credits in the group: In this group you have to gain 30 credits
Requirement courses in the group: In this group you have to complete 1 course
Credits in the group: 30
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
BDIP30	**Diploma Thesis**	Z	30	22s	L	P

Characteristics of the courses of this group of Study Plan: Code=2025_MPRGAIDIP Name=Diploma Thesis

BDIP30	Diploma Thesis	Z	30

Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination.

Code of the group: 2025_MPRGAIP
Name of the group: Compulsory subjects of the programm
Requirement credits in the group: In this group you have to gain 54 credits
Requirement courses in the group: In this group you have to complete 9 courses
Credits in the group: 54
Note on the group:

Code	Name of the course / Name of the group of courses *(in case of groups of courses the list of codes of their members)* *Tutors, **authors** and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
BECM36AIC	**AI for Cybersecurity**	Z,ZK	6	2P+2C	Z	P
BE4M33MPV	**Computer Vision Methods** *Georgios Tolias, Jiří Matas, Jan Čech, Dmytro Mishkin, Ondřej Drbohlav **Ondřej Drbohlav** Jiří Matas (Gar.)*	Z,ZK	6	2P+2C	L	P
BECM33DPL	**Deep Learning Essentials**	Z,ZK	6	2P+2C		P
BECM33MLE	**Machine Learning Engineering**	KZ	6	2P+2C	Z	P
BECM33MLF	**Machine Learning Fundamentals**	Z,ZK	6	2P+2C	L	P
BECM36MLM	**Machine Learning Methods**	Z,ZK	6	2P+2C	L	P
BECM36NLPT	**Natural Language Processing and Translation**	Z,ZK	6	2P+2C	L	P
BECM36STAI	**Selected Topics in AI**	KZ	6	2P+2C	L	P

Characteristics of the courses of this group of Study Plan: Code=2025_MPRGAIP Name=Compulsory subjects of the programm

BECM36AIC	AI for Cybersecurity	Z,ZK	6
The goal of the course is to learn about cybersecurity and the importance of using AI in this field to understand how it transforms our perception of security in general.			
BE4M33MPV	Computer Vision Methods	Z,ZK	6
The course covers selected computer vision problems: search for correspondences between images via interest point detection, description and matching, image stitching, detection, recognition and segmentation of objects in images and videos, image retrieval from large databases and tracking of objects in video sequences. This course is also part of the inter-university programme prg.ai Minor. It pools the best of AI education in Prague to provide students with a deeper and broader insight into the field of artificial intelligence. More information is available at https://prg.ai/minor.			
BECM33DPL	Deep Learning Essentials	Z,ZK	6
The course teaches deep learning methods on known robotic problems, such as semantic segmentation or reactive motion control. The overall goal is timeless, universal knowledge rather than listing all known deep learning architectures. Students are assumed to have working prior knowledge of mathematics (gradient, jacobian, hessian, gradient descent, Taylor polynomial) and machine learning (Bayes risk minimization, linear classifier). The labs are divided into two parts; in the first one, the students will solve elementary deep ML tasks from scratch (including the reimplementation of autograd backpropagation), and in the second one, students will build on existing templates in order to solve complex tasks including RL, vision transformers and generative networks.			
BECM33MLE	Machine Learning Engineering	KZ	6
The course focuses on anchoring theoretical knowledge of artificial intelligence (AI) methods into practice. Upon completion of the course, students should gain a practical understanding of the principles and considerations of applying machine learning to real-world problems. They should get familiar with technologies and workflows that allow them to actionize knowledge acquired throughout the program. The student's work is oriented to the programming language Python, with the option to use C++, Julia, and Rust. During the labs and homework, students become familiar with topics like training pipelines, containerization, and production deployments.			
BECM33MLF	Machine Learning Fundamentals	Z,ZK	6
The aim of this course is to provide a comprehensive understanding of the fundamental principles underlying machine learning algorithms and to explain their use in basic machine learning algorithms. The goal of statistical machine learning is to design systems incorporating models and algorithms capable of learning to solve problems based on the examples provided and prior knowledge of the problem. This course is designed with two main objectives. First, it seeks to clarify the basic principles of learning, such as risk minimization, maximum likelihood learning, and Bayesian learning, and to delve into their theoretical foundations. Second, it seeks to explore the basic models for classification and regression and show how these models can be effectively learned by applying these basic concepts.			
BECM36MLM	Machine Learning Methods	Z,ZK	6
Students will get familiar with machine learning methods that go beyond the standard settings taught in basic ML courses. They will learn methods that work well for tabular and structured data domains (e.g. relational databases), including graph neural networks and recent neuro-symbolic techniques. The course will also teach the students some methods for model interpretability, basics of causality, and reinforcement learning.			
BECM36NLPT	Natural Language Processing and Translation	Z,ZK	6
The course covers the area of natural language processing (NLP) by means of an in-depth focus on the task of machine translation (MT).			
BECM36STAI	Selected Topics in AI	KZ	6
The course aims to immerse students in the forefront of artificial intelligence research, covering current challenges, significant areas of study, and emerging trends in the field. This course will delve into various advanced topics, providing an understanding of contemporary AI issues and innovations.			

Name of the block: Elective courses
Minimal number of credits of the block: 6
The role of the block: V

Code of the group: 2025_MPRGAIVOL
Name of the group: Elective subjects
Requirement credits in the group: In this group you have to gain at least 6 credits (at most 999)
Requirement courses in the group: In this group you have to complete at least 1 course
Credits in the group: 6
Note on the group: # ~Student can choose arbitrary subject of themagister's program (EEM - Electrical Engineering, Power Engineering and Management, EK - Electronics and Communications, KYR - Cybernetics and Robotics, OI - Open Informatics, OES - Open Electronics Systems) which is not part of his curriculum. Student can choose with consideration of recommendation of the branch guarantee.You can find a selection of optional courses organized by the departments on the web site http://www.fel.cvut.cz/cz/education/volitelne-predmety.html

List of courses of this pass:

Code	Name of the course	Completion	Credits
BDIP30	Diploma Thesis	Z	30
Independent final comprehensive work for the Master's degree study programme. A student will choose a topic from a range of topics related to his or her branch of study, which will be specified by branch department or branch departments. The diploma thesis will be defended in front of the board of examiners for the comprehensive final examination.			
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The goal of the course is to learn about cybersecurity and the importance of using AI in this field to understand how it transforms our perception of security in general.			
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Students will get familiar with machine learning methods that go beyond the standard settings taught in basic ML courses. They will learn methods that work well for tabular and structured data domains (e.g. relational databases), including graph neural networks and recent neuro-symbolic techniques. The course will also teach the students some methods for model interpretability, basics of causality, and reinforcement learning.			
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For updated information see http://bilakniha.cvut.cz/en/FF.html
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