Recomended pass through the study plan

Name of the pass: prg.ai Master - Passage through study

Faculty/Institute/Others:
Department:
Pass through the study plan: prg.ai Master
Branch of study guranteed by the department: Welcome page
Guarantor of the study branch:
Program of study: Welcome page
Type of study: unknown full-time
Note on the pass:

Coding of roles of courses and groups of courses:
P - compulsory courses of the program, PO - compulsory courses of the branch, Z - compulsory courses, S - compulsory elective courses, PV - compulsory elective courses, F - elective specialized courses, V - elective courses, T - physical training courses

Coding of ways of completion of courses (KZ/Z/ZK) and coding of semesters (Z/L):
KZ - graded assesment, Z - assesment, ZK - examination, L - summer semester, Z - winter semester

Number of semester: 1

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
BECM33DPL	**Deep Learning Essentials**	Z,ZK	6	2P+2C	Z	P
BECM33MLE	**Machine Learning Engineering**	KZ	6	2P+2C	Z	P
2025_MPRGAIVOL	**Elective subjects**	Min. cours. 1	Min/Max 6/999			V

Number of semester: 2

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
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
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

Number of semester: 3

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

List of groups of courses of this pass with the complete content of members of individual groups

Kód	Name of the group of courses and codes of members of this group (for specification see here or below the list of courses)	Completion	Credits	Scope	Semester	Role
2025_MPRGAIVOL	**Elective subjects**	**Min. cours. 1**	**Min/Max** 6/999			**V**

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.			
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.			
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.			
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.			

For updated information see http://bilakniha.cvut.cz/en/FF.html
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