# Subject card

| Subject name and code | , PG_00052288 | | | | | | |
|---|---|---|---|---|---|---|---|
| Field of study | Mathematics | | | | | | |
| Date of commencement of studies | October 2022 | | Academic year of realisation of subject | | 2022/2023 | | |
| Education level | second-cycle studies | | Subject group | | Optional subject group Subject group related to scientific research in the field of study | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 1 | | Language of instruction | | Polish | | |
| Semester of study | 1 | | ECTS credits | | 4.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Zakład Analizy Nieliniowej -> Instytut Matematyki Stosowanej -> Faculty of Applied Physics and Mathematics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Marcin Styborski | | | | |
| | Teachers | | | | | | |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 15.0 | 0.0 | 45.0 | 0.0 | 0.0 | 60 |
| | E-learning hours included: 0.0 | | | | | | |

| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | Self-study | SUM |
|---|---|---|---|---|---|
| | Number of study hours | 60 | 5.0 | 35.0 | 100 |

| Subject objectives | The aim of the course is to familiarize students with the methods used in the daily practice of the LPP Data Sience team and practical training. |
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| Learning outcomes | Course outcome | Subject outcome | Method of verification |
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| | K7_W11 | The student performs tasks related to machine learning. The student is able to work with data warehouses. | [SW3] Assessment of knowledge contained in written work and projects |
| | K7_U11 | The student knows what machine learning is. He knows its types and the process of creating. The student works with data warehouses and uses them for mathematical modeling. | [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools |
| | K7_K03 | The student performs a specific project task in a group, which ends with its explanation and visualization. As a result, he learns teamwork, regularity and responsibility for the entrusted component task. | [SK2] Assessment of progress of work [SK1] Assessment of group work skills |
| | K7_W08 | The student uses SQL and Python in practice to solve specific problems in business | [SW3] Assessment of knowledge contained in written work and projects |

| Subject contents | |
|---|---|
| | LPP business<br><br>• Business processes and supply chain<br>• Data Science in the organization<br>• Roles in the Data Science team<br><br>Business Intelligence and Cubes<br><br>• Data warehouses<br>• Data modeling<br>• OLAP and tabular cubes<br><br>SQL<br><br>• Introduction to SQL<br>• Tables, partitions, clustered and non-clustered indexes, or how the database holds the data<br>• Data reading and performance<br><br>Data Science in practice<br><br>• Machine learning in business<br>• Types of machine learning models and the development process<br>• Basic metrics used in machine learning models<br>• Interpreting the results of machine learning models<br><br>SCRUM<br><br>• Explanation of the Scrum framework<br>• Roles, artifacts, events<br>• Scrum Tale simulation game |
| Prerequisites and co-requisites | Basic knowledge of Python and SQL. Basic knowledge of probability and statistics. |

### Assessment methods and criteria

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Project execution in classes (10 weeks * 5 points) | 50.5% | 50.0% |
| Project implementation (30 points) | 50.5% | 30.0% |
| Class attendance and active participation in lectures (5 weeks * 4 points) | 50.5% | 20.0% |

### Recommended reading

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| Basic literature | 1. The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition (Springer Series in Statistics) 2nd Edition Trevor Hastie, Robert Tibshirani, Jerome Friedman<br>2. Probabilistic Machine Learning: An Introduction Kevin Patrick Murphy. MIT Press, 2021.<br>3. Python. Machine learning i deep learning. Biblioteki scikit-learn i TensorFlow 2. Wydanie III, Sebastian Raschka, Vahid Mirjalili, Helion 2021<br>4. Zapytania w SQL. Przyjazny przewodnik. Wydanie IV, John L. Viescas, Helion 2021 |
| Supplementary literature | 1. Python w analizie danych. Przetwarzanie danych za pomocą pakietów pandas i numpy oraz środowiska ipython. Wydanie II, Wes McKinney, Wydawnictwo Helion<br>2. Uczenie maszynowe z użyciem Scikit-Learn. Aurelion Geron, Wydawnictwo Helion<br>3. Hurtownie danych. Od przetwarzania analitycznego do raportowania. Wydanie II, Adam Pelikant, Helion 2021 |
| eResources addresses | Adresy na platformie eNauczanie:<br><br>Laboratorium specjalistyczne - Moodle ID: 26917<br>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26917 |

| Example issues/ example questions/ tasks being completed | Work in the design laboratory billed in weekly incremental cycles in accordance with the Scrum framework. Timely delivery of weekly gains from project implementation in accordance with the developed Road Map. Verification will take place during review at each classes. Finally, a team presentation of the results obtained. |
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| Work placement | Not applicable |