University of Gdańsk

Subject card

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| Subject name and code | Data mining, PG_00199390 | | |
| Field of study | Economics | | |
| Date of commencement of studies | October 2026 | Academic year of realisation of subject | 2026/2027 |
| Education level | Master's studies | Subject group | Obligatory subject group in the field of study<br>Optional subject group<br>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 | 2 | ECTS credits | 3.0 |
| Learning profile | academic | Assessment form | exam |
| Conducting unit | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr Tomasz Czuba | |
| | Teachers | dr Tomasz Czuba | |

**Lesson types**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 15.0 | 15.0 | 0.0 | 30.0 | 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 | 0.0 | 15.0 | 75 |

**Subject objectives**

To learn how to analyse data using different statistical methods. To search statistical methods for their verification.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [EKONMU2_U08] can independently analyse economic and social phenomena and processes, and can perform a theoretically deepened assessment of such phenomena, using appropriately selected research method | The student is able to use basic computer programmes in the acquisition and analysis of data necessary for professional work. | [SU2] presentation/project/paper/ report<br>[SU6] demonstration of practical skills |
| [EKONMU2_K05] correctly identifies, diagnoses and solves advanced dilemmas and alternative solutions related to the profession | Students will be able to correctly interpret economic phenomena, correctly analyse the causes and course of economic processes. | [SK2] presentation/project/paper/ report<br>[SK5] implementation of a problem task |
| [EKONMU2_W06] has an in-depth understanding of statistical and econometric methods and tools for describing and modelling macro- and microeconomic economic structures and public institutions, as well as the processes taking place within them. | Students will learn to prepare speeches and oral presentations in Polish and English on selected topics. | [SW1] oral statement/ conversation/discussion<br>[SW2] presentation/project/paper/ report<br>[SW5] implementation of a problem task |

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| Subject contents | **1-2 Data mining as an analytical process**<br>Types of data resources, availability of data, methods of data aggregation, ways of combining data, programs used in the data mining process.<br><br>**3-6 The data mining process - Exploration.**<br>Data preparation. Data cleaning and transformation, selection of subsets of records pre-selection of variables (features). Reducing the number of analysed variables to a level that allows to perform the analysis efficiently.<br><br>**7-10 Data mining process - Model building and evaluation.**<br>Consideration of a variety of models, selection of the best one. Model evaluation criterion - quality of prediction (i.e. correctness of determining the value of the modelled variable and stability of results for different samples).<br><br>**11-14 Data mining process - Implementation and application of models.**<br>Applying for new data the models obtained and considered best. Deriving predicted values or classifications**.**<br><br>**15. Group presentations**<br><br>Deepens knowledge by solving problems outside of classes and consulting with the instructor. |
| Prerequisites and co-requisites | |
| Assessment methods and criteria | |

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Group presentations of data mining projects | 100.0% | 100.0% |

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| Recommended reading | |
| Basic literature | 1. M. Lasek, Metody Data Mining w analizowaniu i prognozowaniu kondycji ekonomicznej przedsiębiorstw, Difin 2007.<br>2. D. Larose, Metody i modele eksploracji danych, PWN 2008<br>3. original studies by T. Czuba (distributed during classes)<br>4. own databases |
| Supplementary literature | T. Hastie, R. Tibshirani, J. H. Friedman, *The elements of statistical learning: Data mining, inference, and prediction*. New York: Springer 2001. |
| eResources addresses | |
| Example issues/ example questions/ tasks being completed | 1. Analysis of the structure of databases<br>2 Types of databases<br>3 Statistical methods in database analysis |
| Work placement | Not applicable |

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