

## Subject card

|                                             |                                                                                                                                                                                                                 |                                                          |                                         |                                     |                                                                                                                                                |            |     |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Analytical Software and Data Visualization - Econometric Profile, PG_00203605                                                                                                                                   |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Field of study                              | Informatics and Econometrics                                                                                                                                                                                    |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Date of commencement of studies             | October 2026                                                                                                                                                                                                    |                                                          | Academic year of realisation of subject |                                     | 2027/2028                                                                                                                                      |            |     |
| Education level                             | Bachelor'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                               | 2                                                                                                                                                                                                               |                                                          | Language of instruction                 |                                     | Polish                                                                                                                                         |            |     |
| Semester of study                           | 3                                                                                                                                                                                                               |                                                          | ECTS credits                            |                                     | 7.0                                                                                                                                            |            |     |
| Learning profile                            | academic                                                                                                                                                                                                        |                                                          | Assessment form                         |                                     | exam                                                                                                                                           |            |     |
| Conducting unit                             |                                                                                                                                                                                                                 |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                              |                                                          | mgr Tomasz Jastrzębski                  |                                     |                                                                                                                                                |            |     |
|                                             | Teachers                                                                                                                                                                                                        |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                     | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                                                                                        | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                           | 30.0                                                     | 30.0                                    | 15.0                                | 0.0                                                                                                                                            | 0.0        | 75  |
|                                             | 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                                                                                                                                                                                           | 75                                                       |                                         | 4.0                                 |                                                                                                                                                | 96.0       | 175 |
| Subject objectives                          | Familiarization with IT tools for statistical and econometric analysis and data presentation. Acquiring the skills to independently develop software for data analysis, visualization, and computer simulation. |                                                          |                                         |                                     |                                                                                                                                                |            |     |

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| Learning outcomes                                              | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                                                                             | Method of verification                  |
|                                                                | [IiEL3_W06] Knows and understands, to an advanced degree, the processes and methods of creating, developing, and providing appropriate conditions for using informatics or statistics tools, particularly those that improve human and organizational functioning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | The student knows and is able to select appropriate IT tools (taking into account their limitations) enabling the acquisition, processing and analysis of data reflecting the functioning of the organization and the processes taking place in its environment.                                                                                                                                                                                            | [SW2] presentation/project/paper/report |
|                                                                | [IiEL3_U02] Can select or construct econometrics, informatics or statistics tools and apply them to describe and solve economic and social problems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The student is able to select or construct econometric, IT, or statistical tools enabling the acquisition, processing, and analysis of data reflecting the functioning of phenomena and processes occurring in the socioeconomic environment.                                                                                                                                                                                                               | [SU2] presentation/project/paper/report |
|                                                                | [IiEL3_U03] Can obtain data from appropriately selected sources, use these data to solve economic and social problems, and process and interpret them using econometrics, informatics or statistics tools                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | The student is able to utilize various data sources and use appropriate methods of data acquisition and processing using appropriate IT, statistical, or econometric tools to perform socio-economic analyses.                                                                                                                                                                                                                                              | [SU2] presentation/project/paper/report |
|                                                                | [IiEL3_W05] Knows and understands the methods, techniques and informatics or statistics tools used to acquire, collect, process and present data in decision-making processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | The student knows and is able to select appropriate IT or statistical tools enabling the acquisition, collection, processing and visualization of data reflecting the functioning of phenomena and processes occurring in the socio-economic environment.                                                                                                                                                                                                   | [SW2] presentation/project/paper/report |
| Subject contents                                               | <b>Excel</b> <ul style="list-style-type: none"><li>Statistical functions built into Excel, their applications, and limitations;</li><li>Methods for calculating characteristics not included in Excel;</li><li>Performing statistical analyses in Excel for statistical data analysis;</li><li>Using the Data Analysis tool in statistical analysis;</li><li>Downloading/exporting data (.csv)</li><li>Organizing data (variable formats);</li><li>Creating charts.</li></ul> <b>Statistica</b> <ul style="list-style-type: none"><li>General information about the program;</li><li>Program windows: data editor, report, and command windows;</li><li>Working with a sample data set;</li><li>Defining variables and values;</li><li>Downloading data from external files;</li><li>Statistical analysis;</li><li>Transforming variables;</li><li>Weighing data;</li><li>Filtering a data set;</li><li>Subset analysis;</li><li>Data validation;</li><li>Creating and editing charts;</li><li>Work automation (single analysis macros, global macros).</li></ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |
| Prerequisites and co-requisites                                | Knowledge of descriptive statistics tools and mathematical statistics.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                           | Percentage of the final grade           |
|                                                                | Project 1 (Excel)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 50.0%                                   |
|                                                                | Project 2 (Statistica)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 50.0%                                   |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1. K. Grzeszkiewicz-Radulska, J. Wiktorowicz, M.M. Grzelak, Analiza statystyczna z IBM SPSS Statistics, Wydawnictwo UŁ, Łódź 2020, <a href="https://wydawnictwo.uni.lodz.pl/wp-content/uploads/2021/01/Wiktorowicz-i-in._Analiza-statystyczna-.pdf">https://wydawnictwo.uni.lodz.pl/wp-content/uploads/2021/01/Wiktorowicz-i-in._Analiza-statystyczna-.pdf</a><br>2. M. Rabiej, Analizy statystyczne z programami Statistica i Excel, Helion, Gliwice, 2018 |                                         |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | None                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |
| Example issues/<br>example questions/<br>tasks being completed |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |

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