



## Subject card

|                                             |                                                                                                                                                                                                                                                                                             |                                                          |                                                                                                                                                                                                                       |                                     |                                                                                                                      |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | APPLICATION OF ECONOMETRIC METHODS IN MANAGEMENT, PG_00061051                                                                                                                                                                                                                               |                                                          |                                                                                                                                                                                                                       |                                     |                                                                                                                      |            |     |
| Field of study                              | ZASTOSOWANIA METOD EKONOMETRYCZNYCH W ZARZĄDZANIU                                                                                                                                                                                                                                           |                                                          |                                                                                                                                                                                                                       |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                                                                                                |                                                          | Academic year of realisation of subject                                                                                                                                                                               |                                     | 2025/2026                                                                                                            |            |     |
| Education level                             | second-cycle studies                                                                                                                                                                                                                                                                        |                                                          | Subject group                                                                                                                                                                                                         |                                     | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |            |     |
| Mode of study                               | Part-time studies (on-line)                                                                                                                                                                                                                                                                 |                                                          | Mode of delivery                                                                                                                                                                                                      |                                     | blended-learning                                                                                                     |            |     |
| Year of study                               | 1                                                                                                                                                                                                                                                                                           |                                                          | Language of instruction                                                                                                                                                                                               |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 1                                                                                                                                                                                                                                                                                           |                                                          | ECTS credits                                                                                                                                                                                                          |                                     | 3.0                                                                                                                  |            |     |
| Learning profile                            | general academic profile                                                                                                                                                                                                                                                                    |                                                          | Assessment form                                                                                                                                                                                                       |                                     | assessment                                                                                                           |            |     |
| Conducting unit                             | Department of Statistics and Econometrics -> Faculty of Management and Economics -> Wydział Politechniki Gdańskiej                                                                                                                                                                          |                                                          |                                                                                                                                                                                                                       |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                          |                                                          | dr inż. Sabina Szymczak                                                                                                                                                                                               |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                    |                                                          | dr inż. Sabina Szymczak                                                                                                                                                                                               |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                 | Lecture                                                  | Tutorial                                                                                                                                                                                                              | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                       | 8.0                                                      | 0.0                                                                                                                                                                                                                   | 16.0                                | 0.0                                                                                                                  | 0.0        | 24  |
|                                             | E-learning hours included: 18.0                                                                                                                                                                                                                                                             |                                                          |                                                                                                                                                                                                                       |                                     |                                                                                                                      |            |     |
|                                             | eNauczanie source addresses:<br>Moodle ID: 46605 Zastosowania Metod Ekonometrycznych zima25<br><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46605">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46605</a>                                                      |                                                          |                                                                                                                                                                                                                       |                                     |                                                                                                                      |            |     |
| 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                                                                                                                                                                                                                                                                       | 24                                                       |                                                                                                                                                                                                                       | 5.0                                 |                                                                                                                      | 46.0       | 75  |
| Subject objectives                          | preparing students to model and analyze economic phenomena and management processes using econometric methods and IT tools, as well as fostering attitudes related to critically evaluating results and making responsible decisions in the context of solving complex management problems. |                                                          |                                                                                                                                                                                                                       |                                     |                                                                                                                      |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                                                                                              |                                                          | Subject outcome                                                                                                                                                                                                       |                                     | Method of verification                                                                                               |            |     |
|                                             | [K7_W03] demonstrates in-depth preparation in the application of management methods and techniques for formulating and solving management problems                                                                                                                                          |                                                          | knows and understands econometric methods in the context of solving complex managerial and economic problems and can indicate the principles of their practical application based on reliable sources of information. |                                     | [SW1] Ocena wiedzy faktograficznej                                                                                   |            |     |
|                                             | [K7_U03] formulates research problems and selects appropriate research methods for their effective solution, using advanced IT tools, and evaluates the obtained results critically                                                                                                         |                                                          | formulates research problems and selects appropriate research methods for their effective solution, using advanced IT tools, and critically evaluates the obtained results.                                           |                                     | [SU4] Ocena umiejętności korzystania z metod i narzędzi                                                              |            |     |

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|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Subject contents                                         | Econometric model - concept, elements and interpretation<br>Classification of econometric models<br>Simple and Multiple Regression Model Estimation Problems - Least Squares Method (LSM)<br>Verification of the estimated form of the model - a measure of the quality of fit<br>Stochastic verification of the estimated form of the model - standard error of estimators and testing the significance of parameters<br>Autocorrelation - causes and testing<br>The concept of conditional econometric forecast<br>Multiplicative models - problems of estimation and interpretation<br>Simple methods of time series analysis - development trend models<br>Cause and effect models of production and work efficiency<br>Cause and effect wage model |                                                                                                                                                                                                                                                                                                                                                               |                               |
|                                                          | Econometric model - concept, elements and interpretation<br>Classification of econometric models<br>Simple and Multiple Regression Model Estimation Problems - Least Squares Method (LSM)<br>Verification of the estimated form of the model - a measure of the quality of fit<br>Stochastic verification of the estimated form of the model - standard error of estimators and testing the significance of parameters<br>Autocorrelation - causes and testing<br>The concept of conditional econometric forecast<br>Multiplicative models - problems of estimation and interpretation<br>Simple methods of time series analysis - development trend models<br>Cause and effect models of production and work efficiency<br>Cause and effect wage model |                                                                                                                                                                                                                                                                                                                                                               |                               |
| Prerequisites and co-requisites                          | Descriptive statistics, mathematical statistics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                               |                               |
| Assessment methods and criteria                          | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Passing threshold                                                                                                                                                                                                                                                                                                                                             | Percentage of the final grade |
|                                                          | problem-based test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 60.0%                                                                                                                                                                                                                                                                                                                                                         | 30.0%                         |
|                                                          | Calculation tasks (test)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 60.0%                                                                                                                                                                                                                                                                                                                                                         | 35.0%                         |
|                                                          | project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 60.0%                                                                                                                                                                                                                                                                                                                                                         | 35.0%                         |
| Recommended reading                                      | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Gruszczynski, M. Kuszewski T., Podgórska M.,(red. nauk.), Ekonometria i badania operacyjne. Wydawnictwo Naukowe PWN, Warszawa.<br>Borkowski, B., Dudek, H., Szczęśny, W. (2020). Ekonometria. Wybrane zagadnienia, Wydawnictwo Naukowe PWN, Warszawa.<br>Aczel, A.D., Sounderpandian, J. (2017), Statystyka w zarządzaniu. Wydawnictwo Naukowe PWN, Warszawa. |                               |
|                                                          | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Welfe, A. (2003) Ekonometria. Metody i ich zastosowanie.Wyd. III zmienione. Polskie Wydawnictwo Ekonomiczne,Warszawa.<br>Maddala G.S. (2006) Ekonometria. Warszawa: WydawnictwoNaukowe PWN<br>Greene W.H. (2012) Econometric Analysis, 7th Edition                                                                                                            |                               |
|                                                          | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                               |                               |
|                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                               |                               |
| Example issues/ example questions/ tasks being completed | Estimate and interpret a linear regression model for the number of university applicants (applied), where the explanatory variables are the application fee (applfee), tuition fee (tuition), and room and board costs (room). Set the significance level to alpha = 0.1. Write down the equation before and after estimation. Comment on the model's goodness of fit. Test the normality of the residual distribution using the selected test.                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                               |                               |
| Practical activites within the subject                   | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                               |                               |

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