

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                                              |                                     |                                                                                                                      |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Quantitative and Qualitative Research Methods, PG_00157409                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                              |                                     |                                                                                                                      |            |     |
| Field of study                              | Information Science and Econometrics                                                                                                                                                                                                                                                                                                                                                                                      |                                                          |                                                              |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2024                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          | Academic year of realisation of subject                      |                                     | 2024/2025                                                                                                            |            |     |
| Education level                             | postgraduate 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                               | full-time studies                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Mode of delivery                                             |                                     | at the university                                                                                                    |            |     |
| Year of study                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Language of instruction                                      |                                     | English                                                                                                              |            |     |
| Semester of study                           | 1                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | ECTS credits                                                 |                                     | 7.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          | Assessment form                                              |                                     |                                                                                                                      |            |     |
| Conducting unit                             | Katedra Statystyki -> Faculty of Management                                                                                                                                                                                                                                                                                                                                                                               |                                                          |                                                              |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          | prof. dr hab. Mirosław Szreder                               |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          | prof. dr hab. Mirosław Szreder<br><br>dr Arkadiusz Kozłowski |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                               | Lecture                                                  | Tutorial                                                     | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                     | 30.0                                                     | 0.0                                                          | 30.0                                | 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                                                       |                                                              | 30.0                                |                                                                                                                      | 85.0       | 175 |
| Subject objectives                          | The aim of the course is to familiarize students with the methods and techniques of business research, including collecting and preparing data, using descriptive statistics and statistical inference, as well as the most important techniques of qualitative research. An important aspect of the research objective is for students to master modern, correct forms of presenting and communicating research results. |                                                          |                                                              |                                     |                                                                                                                      |            |     |

| Learning outcomes | Course outcome                                                                                                                                                                                                                                                                                                                                                   | Subject outcome                                                                                                                                                                                                                                                                                          | Method of verification                                                                                                       |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|                   | [liEMU2_W05] The student has an in-depth knowledge of socio-economic data sources, their databases and how to create them.                                                                                                                                                                                                                                       | Has in-depth knowledge of the sources of socio-economic data used in statistical research, their databases and the method of their creation.                                                                                                                                                             | [SW4] test/exam - oral or written<br>[SW2] presentation/project/paper/report                                                 |
|                   | [liEMU2_K02] The student can communicate freely with the public on specialised topics in the field of computer science and econometrics in and outside the workplace, communicate his knowledge and share his skills through various media. Culturally participates in discussions, is not afraid to ask questions and knows how to give constructive criticism. | Can freely communicate with his/her environment on specialist topics in the field of statistical methods, convey his/her knowledge and share skills using various media. Participates in discussions in a cultured manner, is not afraid to ask questions and is able to express constructive criticism. | [SK1] oral statement/conversation/discussion<br>[SK4] test/exam - oral or written                                            |
|                   | [liEMU2_U02] The student is able to proficiently acquire detailed information about economic processes and phenomena through direct observation, planned experimentation or database queries, as well as collect and process it using modern information technology tools.                                                                                       | Is able to efficiently obtain detailed information about economic processes and phenomena through direct observation, planned experiment or database query, and describe them and draw conclusions using statistical methods                                                                             | [SU2] presentation/project/paper/report<br>[SU4] test/exam - oral or written                                                 |
|                   | [liEMU2_W04] The student has an in-depth knowledge of advanced mathematical, statistical, econometric and IT methods that enable the acquisition, processing and analysis of data reflecting the functioning and growth of the national economy and its components, as well as the phenomena and processes occurring in their environment.                       | Has in-depth knowledge of advanced quantitative and qualitative statistical methods enabling the acquisition, processing and analysis of data reflecting the functioning and growth of the national economy and its components as well as phenomena and processes occurring in their environment.        | [SW4] test/exam - oral or written<br>[SW2] presentation/project/paper/report                                                 |
|                   | [liEMU2_U05] The student is able to make a statistical description of basic and detailed economic categories at an advanced level, formulate and verify hypotheses about their formation.                                                                                                                                                                        | Is able to provide an advanced statistical description of basic and detailed economic categories, formulate and verify hypotheses regarding their formation using quantitative and qualitative methods.                                                                                                  | [SU2] presentation/project/paper/report<br>[SU4] test/exam - oral or written                                                 |
|                   | [liEMU2_K01] The student understands the need for continuous completion and deepening of acquired knowledge. The student inspires and organizes others' learning processes.                                                                                                                                                                                      | Understands the need to continually supplement and deepen the acquired knowledge in the field of statistical research                                                                                                                                                                                    | [SK8] observation of student's independent or team work                                                                      |
|                   | [liEMU2_K03] The student is able to communicate freely with the public inside and outside the workplace, transfer his knowledge and share his skills through various media.                                                                                                                                                                                      | Is able to communicate freely with the environment in and outside the workplace, convey his/her knowledge and share his/her skills in the field of statistical research using various media.                                                                                                             | [SK1] oral statement/conversation/discussion<br>[SK2] presentation/project/paper/report<br>[SK4] test/exam - oral or written |

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|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Subject contents                                               | 1. Managerial value of business research. Types of research.                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 2. Stages in the research process. Data collection, the role of secondary and primary data.                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 3. Sampling design process: definition of the population, sampling frame, random and non-random sampling techniques. |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 4. Designing questionnaires in quantitative research and principles of creating scenarios for qualitative research.  |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 5. Descriptive statistics and inferential statistics.                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 6. Descriptive measures of central tendency and variation.                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 7. Bivariate analysis: measures of association, correlation and regression.                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 8. Theory of statistical inference, estimation and hypothesis testing.                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 9. Confidence intervals, confidence level.                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 10. Testing statistical hypotheses, error types I and II, significance level, power of a test.                       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
|                                                                | 11. Communicating research results towards data storytelling                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
| Prerequisites and co-requisites                                | Working knowledge of Excel and mathematical concepts and notation.                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
| Assessment methods and criteria                                | Subject passing criteria                                                                                             | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                       | Percentage of the final grade |
|                                                                | Assignment - conducting research and presenting results                                                              | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                   | 50.0%                         |
|                                                                | Written exam                                                                                                         | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                   | 25.0%                         |
|                                                                | In-class activities                                                                                                  | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                   | 25.0%                         |
| Recommended reading                                            | Basic literature                                                                                                     | Zikmund W.G., Business Research Methods (5th ed.). The Dryden Press,<br><br>Saunders M., Lewis P., Thornhill P., Research Methods for Business Students. Pearson Education Ltd.<br><br>Malhotra N.K., Marketing Research: An Applied Orientation, Global Edition 7th, Pearson Education Ltd.<br><br>Frost J., Introduction to Statistics: An Intuitive Guide for Analyzing Data and Unlocking Discoveries. Statistics By Jim Publishing |                               |
|                                                                | Supplementary literature                                                                                             | Szreder M., On the Importance of Statistical Confidentiality for the Quality of Survey Data. <i>Statistics in Transition</i> , 2008, vol. 9, no. 1, pp. 183-186.<br><br>Szreder M., Will big data affect opinion polls? <i>Archives of Data Science, Series A</i> , KIT Scientific Publishing, Vol. 4, No. 1, 2018.                                                                                                                     |                               |
|                                                                | eResources addresses                                                                                                 | Adresy na platformie eNauczanie:                                                                                                                                                                                                                                                                                                                                                                                                        |                               |
| Example issues/<br>example questions/<br>tasks being completed |                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |
| Work placement                                                 | Not applicable                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                               |

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