# GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

| Subject name and code | Planning of experimental research, PG_00057484 | | | | | |
|---|---|---|---|---|---|---|
| Field of study | Mechanical and Medical Engineering | | | | | |
| Date of commencement of studies | February 2024 | | Academic year of realisation of subject | | 2023/2024 | |
| Education level | second-cycle studies | | Subject group | | Obligatory subject group in the field of study | |
| | | | | | Subject group related to scientific research in the field of study | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | |
| Year of study | 1 | | Language of instruction | | Polish | |
| Semester of study | 1 | | ECTS credits | | 2.0 | |
| Learning profile | general academic profile | | Assessment form | | assessment | |
| Conducting unit | Zakład Mechaniki Stosowanej i Biomechaniki -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Wiktoria Wojnicz | | | |
| | Teachers | | dr hab. inż. Wiktoria Wojnicz | | | |
| | | | dr inż. Grzegorz Rotta | | | |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 15.0 | 15.0 | 0.0 | 0.0 | 0.0 | 30 |
| | 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 | 30 | 3.0 | 17.0 | 50 |

| Subject objectives | The aim of the subject is to present methods used to plan experimental testing and elaborate the results of the testing |
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| Learning outcomes | Course outcome | Subject outcome | Method of verification |
|---|---|---|---|
| | [K7_U08] He/she can formulate and verify hypotheses for simple engineering problems and research | The student can formulate hypothesis, choose and apply a method to verify this hypothesis and draw conclusions | [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment |
| | [K7_K03] He/she can analyze and realize given tasks proposing entrepreneur and creative activities | The student can state the problem to test, assess the testing group, perform the testing, elaborate the results and test the hypothesis | [SK2] Assessment of progress of work [SK1] Assessment of group work skills |
| | [K7_W05] He/she has in-depth knowledge related to the methods and techniques used in medicine | The student can formulate hypothesis on the base of acquired knowledge related to the methods and technologies applied in medicine | [SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge |

| Subject contents | **Lectures (15h) (DSc PhD Wiktoria Wojnicz)**Describing statistics. Random variables. Normal distribution. T-Student distribution. Chi-squared distribution.Parametric estimation.Chosen statistical tests: Normal distribution testing, Homogeneity of variances testing, T-Student testes, Nonparametric tests for independent samples Nonparametric tests for dependent samplesANOVA, Kruskal-Wallis test and median test.Linear regressionMultilinear regressionLinearized nonlinear regression (for chosen functions). Nonlinear estimation. Time series. Methods of prediction **Tutorials (15h) (PhD Grzegorz Rotta)**The scope covers chosen topics from LecturesTestRepeat test |
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| Prerequisites and co-requisites | Math |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|---|
| | pass of the lectures | 50.0% | 50.0% |
| | pass of the tutorials | 50.0% | 50.0% |

| Recommended reading | Basic literature | M.Rabiej, Statystyka z programem Statistica, Helion, 2012 |
|---|---|---|
| | | StatSoft. Poradnik statystyczny. https://www.statsoft.pl/textbook/stathome_stat.html?https%3A%2F%2Fwww.statsoft.pl%2Ftextbook%2Fadvans1.html |
| | Supplementary literature | Literatures related to the mathematical statistics |
| | eResources addresses | Adresy na platformie eNauczanie: Planowanie Badań Doświadczalnych 2023/2024 - Ćwiczenia - Moodle ID: 38775 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38775 |

| Example issues/ example questions/ tasks being completed | Assess the minimum number of samples by considering the given threshold p |
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| Work placement | Not applicable |
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