GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Planning of experimental research, PG_00057484 | | |
| Field of study | Mechanical and Medical Engineering | | |
| Date of commencement of studies | February 2023 | Academic year of realisation of subject | 2022/2023 |
| 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 | 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<br>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

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [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 | [SW1] Assessment of factual knowledge<br>[SW2] Assessment of knowledge contained in presentation<br>[SW3] Assessment of knowledge contained in written work and projects |
| [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 | [SK1] Assessment of group work skills<br>[SK2] Assessment of progress of work |
| [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 | [SU1] Assessment of task fulfilment<br>[SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools<br>[SU5] Assessment of ability to present the results of task |

**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

**Prerequisites and co-requisites**

Math

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>pass of the tutorials</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>pass of the lectures</td><td>50.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>M.Rabiej, Statystyka z programem Statistica, Helion, 2012<br><br>StatSoft. Poradnik statystyczny. https://www.statsoft.pl/textbook/stathome_stat.html?https%3A%2F%2Fwww.statsoft.pl%2Ftextbook%2Fadvans1.html</td></tr>
<tr><td>Supplementary literature</td><td>Literatures related to the mathematical statistics</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:<br>Planowanie badań doświadczalnych,Wykład,IMM II,letni 2022-2023 (PG_00057484) - Moodle ID: 28920 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28920<br>Planowanie badań doświadczalnych,Wykład,IMM II,letni 2022-2023 (PG_00057484) - Moodle ID: 28920 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28920</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Assess the minimum number of samples by considering the given threshold p</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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