GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	INSURANCE STATISTICS, PG_00070508		
Field of study	Economic Analytics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	English
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Statistics and Econometrics -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Jarosław Krajewski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

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	45	3.0	27.0	75

Subject objectives

preparing students to independently analyze and interpret insurance data and assess insurance risk based on knowledge of statistics, econometrics, and the functioning of the insurance market, while fostering attitudes of analytical integrity, responsible use of data, and effective communication of analytical results in the context of decision-making in the financial and insurance sector.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W06] knows and understands the principles of evaluating the reliability of utilized data, applying in-depth specialized knowledge in the field of economic analysis.	knows and understands the principles of assessing the reliability of statistical data and the methods of insurance risk analysis, in the context of selecting statistical and econometric methods and interpreting the results of analyses in the insurance sector.	[SW1] Assessment of factual knowledge
[K7_K01] is ready to critically evaluate his/her knowledge in economic analytics and seek expert opinions when facing difficulties in solving a problem independently.	is ready to critically assess the outcomes of insurance statistics analyses and the reliability of data.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U02] presents logical and well-founded arguments regarding obtained results through the analysis and synthesis of information in various business contexts, critically evaluating their interpretation.	is able to present and justify conclusions derived from statistical analyses in insurance, based on the integration of data from multiple sources and a critical interpretation of results in the context of insurance decisions.	[SU3] Assessment of ability to use knowledge gained from the subject [SU5] Assessment of ability to present the results of task

<table>
<tr><td>Subject contents</td><td>Course content – lecture
1. Introduction to insurance statistics
2. Elements of probability theory particularly used in insurance (conditional probability, total probability, Bayes theorem)
3. Insurance risk
4. Claims frequency analysis
5. Claims severity analysis
6. Statistical description of an insurance portfolio
7. Relationships between variables
8. Insurance risk models
9. Segmentation and risk classes
10. Simulation, forecasting, and model evaluation
11. Life tables: construction and applications
12. Analysis of life insurance markets in Poland and worldwide

Course content – laboratory
1. Introduction to insurance statistics
2. Elements of probability theory particularly used in insurance (conditional probability, total probability, Bayes theorem)
3. Insurance risk
4. Claims frequency analysis
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8. Insurance risk models
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10. Simulation, forecasting, and model evaluation
11. Life tables: construction and applications
12. Analysis of life insurance markets in Poland and worldwide</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Open-ended question test (exam).</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Computational and computational-decision tasks (Colloquium 1).</td><td>60.0%</td><td>25.0%</td></tr>
<tr><td>Computational and computational-decision tasks (Colloquium 2).</td><td>60.0%</td><td>25.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Hossack, I. B., Pollard, J. H., & Zehnwirth, B. (2019). Introductory statistics with applications in general insurance (2nd ed.). Cambridge University Press</td></tr>
<tr><td>Supplementary literature</td><td>1. American Council of Life Insurers. (2024). Life insurers fact book 2024</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>• Probability theory (application, e.g., Bayes theorem)
• Sources of insurance data
• Loss ratio
• Structure of an insurance portfolio
• Measures of structure, concentration, and diversification
• Correlation between claims frequency and the drivers age
• Customer classification based on characteristics
• Trends and international comparisons</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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