# GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

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| Subject name and code | FINANCIAL AND INSURANCE MATHEMATICS, PG_00066515 |
| Field of study | Economic Analytics |

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| Date of commencement of studies | October 2024 | Academic year of realisation of subject | 2024/2025 |
| Education level | first-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 | Part-time studies (on-line) | Mode of delivery | blended-learning |
| Year of study | 1 | Language of instruction | Polish |
| Semester of study | 2 | ECTS credits | 4.0 |
| Learning profile | general academic profile | Assessment form | assessment |

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| Conducting unit | Department of Finance -> Faculty of Management and Economics |

| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Marcin Potrykus |
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| | Teachers | dr inż. Marcin Potrykus |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
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| | Number of study hours | 8.0 | 16.0 | 0.0 | 0.0 | 0.0 | 24 |
| | E-learning hours included: 18.0 | | | | | | |

| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | Self-study | SUM |
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| | Number of study hours | 24 | 6.0 | 70.0 | 100 |

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| Subject objectives | Identifies mathematical concepts and tools used in finance, banking and insurance |

| Learning outcomes | Course outcome | Subject outcome | Method of verification |
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| | [K6_U04] Develops logical solutions to complex or unstructured problems in processes conducted under conditions of uncertainty | analyzes the influence of various factors which influence the studied phenomenon, striving to obtain an optimal solution | [SU2] Assessment of ability to analyse information |
| | [K6_W02] Demonstrates advanced knowledge of methods and techniques related to the field of study in economic analytics to explain complex problems. | selects appropriate methods and mathematical techniques to analyse financial problems | [SW1] Assessment of factual knowledge |

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| Subject contents | Time value of money - introduction.<br>Simple interest model (SIM), Capital Gains Tax.<br>Compound interest model (CIM) with annual, sub-period and continuous capitalization.<br>The calculation of the mathematical and commercial discount.<br>Valuation of short-term securities.<br>Real capital value, real interest rate.<br>Annuities - without capitalization, with capitalization, equal, compatible and non-compatible.<br>Valuation of long-term securities.<br>Construction of the loan repayment schedule, APRC calculation.<br>Property insurance - calculation of net and gross premium.<br>Calculation of single and multiple premiums in life, endowment and mixed insurance. |
| Prerequisites and co-requisites | |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
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| | Test and activity in the class | 60.0% | 60.0% |
| | Final test | 60.0% | 40.0% |

| Recommended reading | Basic literature | Podgórska, M., Klimkowska, J. (2022). Matematyka finansowa. Warszawa: Wydawnictwo Naukowe PWN.<br>Redo, M., Prewysz-Kwinto, P. (2021). Matematyka finansowa. Warszawa: Wydawnictwo Naukowe PWN.<br>Otto, W. (2015). Matematyka w ubezpieczeniach. Ubezpieczenia majątkowe. Warszawa: WNT.<br>Błaszczyszyn, B., Rolski, T. (2018). Podstawy matematyki ubezpieczeń na życie. Warszawa: Wydawnictwo Naukowe PWN. |
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| | Supplementary literature | Borowski, J., Golański, R., Kasprzyk, K., Melon, L., Pogórska, M. (2003). Matematyka finansowa: przykłady, zadania, testy, rozwiązania. Wałbrzych: Szkoła Główna Handlowa.<br>Cegłowski, B., Podgórski, B. (2021). Finanse z arkuszem kalkulacyjnym. Warszawa: Wydawnictwo Naukowe PWN.<br>Sobczyk, M. (2011). Matematyka finansowa: podstawy teoretyczne, przykłady, zadania. Warszawa: Agencja Wydawnicza Placet.<br>Kellison, S. G. (2008). Theory of interest. New York: McGraw-Hill.<br>Piasecki, K., Ronka-Chmielowiec W. (2011). Matematyka finansowa. Warszawa: C.H. Beck. |
| | eResources addresses | Adresy na platformie eNauczanie:<br>Matematyka finansowa i ubezpieczeniowa sem. lato 24/25 - Moodle ID: 17627<br>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17627 |
| Example issues/ example questions/ tasks being completed | Calculation of the time value of money.<br>Calculation of the future value of investments.<br>APRC calculation.<br>Calculation of premiums in property and life insurance. | |
| Work placement | Not applicable | |

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