



## Subject card

|   |   |  |                                     |            |  |         |     |
|---|---|--|-------------------------------------|------------|--|---------|-----|
| Subject name and code   | Financial Mathematics, PG_00040560  |  |                                     |            |  |         |     |
| Field of study  | Engineering Management  |  |                                     |            |  |         |     |
| Date of commencement of studies   | October 2021  | Academic year of realisation of subject  |                                     |            | 2022/2023  |         |     |
| Education level   | first-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   | 2   | Language of instruction  |                                     |            | Polish   |         |     |
| Semester of study   | 3   | ECTS credits   |                                     |            | 3.0  |         |     |
| Learning profile  | general academic profile  | Assessment form  |                                     |            | assessment   |         |     |
| Conducting unit   | Department of Economic Analysis and Finance -> Faculty of Management and Economics  |  |                                     |            |  |         |     |
| Name and surname of lecturer (lecturers)  | Subject supervisor  |  | dr Piotr Kasprzak                   |            |  |         |     |
|   | Teachers  |  | dr Piotr Kasprzak                   |            |  |         |     |
| Lesson types and methods of instruction   | Lesson type   | Lecture  | Tutorial                            | Laboratory | Project  | Seminar | SUM |
|   | Number of study hours   | 0.0  | 30.0                                | 0.0        | 0.0  | 0.0     | 30  |
|   | E-learning hours included: 0.0  |  |                                     |            |  |         |     |
|   | 22-23 Matematyka finansowa Zarz inż. - Moodle ID: 26408<br><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26408">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26408</a>  |  |                                     |            |  |         |     |
| Additional information:<br>eNauczanie link's course <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26408">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26408</a> |   |  |                                     |            |  |         |     |
| 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   | 6.0                                 | 39.0       | 75   |         |     |
| Subject objectives  | Introducing students to the basic mathematical concepts and tools used in finance and banking.  |  |                                     |            |  |         |     |
| Learning outcomes   | Course outcome  | Subject outcome  |                                     |            | Method of verification   |         |     |
|   | [K6_U02] analyses economic problems, including financial ones in various areas of the organisation's functioning, also when formulating and solving engineering tasks   | The student is able to apply the acquired knowledge in practice, e.g. assess the value of money in time or decide on the choice of the source of financing (eg the cheapest loan). |                                     |            | [SU1] Assessment of task fulfilment  |         |     |
|   | [K6_W06] has a basic knowledge of methods and tools for conducting research and analyses related to particular areas of the enterprise's operations and its environment   | Student knows the valuation methods of the time value of money.  |                                     |            | [SW1] Assessment of factual knowledge  |         |     |
|   | [K6_W11] has the basic knowledge of mathematics, physics and chemistry necessary to solve technical problems  | The student knows the basic economic concepts related to finance, e.g. time value of money, inflation, loan installment.   |                                     |            | [SW1] Assessment of factual knowledge  |         |     |
| Subject contents  | Time value of money introduction; Simple interest, discount rate, compound interest, continuous compounding; Nominal, equivalent, effective and average rate of interest; Inflation rate and real rate of interest; Valuation of short-term securities (bonds and other securities); Annuity immediate and annuity due; Perpetuities; Annuities payable more and less frequently than interest is convertible; Payments varying in arithmetic and geometric progression; Repayment of debts analysis Measurement of investment performance; Valuation of long-term securities; Introduction to the valuation of derivative instruments; Using a spreadsheet in financial mathematics. |  |                                     |            |  |         |     |
| Prerequisites and co-requisites   |   |  |                                     |            |  |         |     |
| Assessment methods and criteria   | Subject passing criteria  | Passing threshold  |                                     |            | Percentage of the final grade  |         |     |
|   | Midterm colloquium  | 60.0%  |                                     |            | 100.0%   |         |     |

|  |   |   |
|--|---|---|
| Recommended reading  | Basic literature  | 1. Podgórska M., Klimkowska J., Matematyka finansowa, Wydawnictwo Naukowe PWN, Warszawa 2005.<br>2. Sobczyk M., Matematyka finansowa: podstawy teoretyczne, przykłady, zadania, Agencja Wydawnicza Placet, Warszawa 2006.   |
|  | Supplementary literature  | 1. Bień W., Bień A., Kalkulacja ceny pieniądza w lokatach, pożyczkach i kredytach, Difin, Warszawa 2006.<br>2. Borowski J., Golański R., Kasprzyk K., Melon L., Pogórska M., Matematyka finansowa: przykłady, zadania, testy, rozwiązania, SGH, Warszawa 2003.<br><br>3. Kellison S. G., The Theory of Interest, McGraw-Hill, 2008.<br><br>4. Matłoka M., Świątłowski J., Matematyka finansowa i funkcje finansowe arkusza kalkulacyjnego, Wydawnictwo WSB, Poznań 2003 |
|  | eResources addresses  | Uzupełniające<br><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26408">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26408</a> - E-course link  |
| Example issues/<br>example questions/<br>tasks being completed | Calculation of the future value of investments, credit instalments and expected retirement value. |   |
| Work placement   | Not applicable  |   |