Opis **zajęć (sylabus)**

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| Nazwa zajęć: | | **Mathematical Economics** | | | | | | | **ECTS** | | **5** |
| Nazwa zajęć w j. angielskim: | | Mathematical Economics | | | | | | | | | |
| Zajęcia dla kierunku studiów: | | **Big Data Analytics** | | | | | | | | | |
|  | |  | | | | | | | | | |
| Język wykładowy: | | angielski | | | | Poziom studiów: | | studia II stopnia | | | |
| Forma studiów: | 🗷 stacjonarne  🞎 niestacjonarne | Status zajęć: | 🗷 podstawowe  🞎 kierunkowe | 🗷 obowiązkowe  🞎 do wyboru | | Numer semestru: ……1….. | | 🗷 semestr zimowy 🞎 semestr letni | | | |
|  |  | Rok akademicki, od którego obowiązuje opis (rocznik): | | | | 2019/2020 | Numer katalogowy: | **ZIM-IE-BDA-2S-01Z-1** | | | |
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| Koordynator zajęć: | |  | | | | | | | | | |
| Prowadzący zajęcia: | |  | | | | | | | | | |
| Jednostka realizująca: | |  | | | | | | | | | |
| Jednostka zlecająca: | |  | | | | | | | | | |
| Założenia, cele i opis zajęć: | | The course is designed to provide students with the fundamental tools of convex optimization and the principal mathematical techniques used in economic theory and modeling.  Topics include fundamental concepts underlying marginal analysis, theory of the consumer: utility maximization, consumer choice and the demand function; theory of the firm: costs and the demand for inputs, profit maximization, cost and profit functions; general equilibrium theory: Walrasian equilibrium, Pareto efficiency, Cobweb model, linear models of economy.  **Content of lectures:**   * History of mathematical economics. * Derivative and its application. Elasticity. * Theory of the consumer. * Theory of the firm. * Market equilibrium. Arrow-Hurwicz model. * Cobweb model. * Linear models of economy.   **Contenet of class:**   * Derivative and its application. * Consumer’s preferences. * Utility functions. Optimal bundle in the budget set. * Demand function and indirect utility, compensated demand and expenditure function. * Theory of the firm and optimization problems, the cost function, the supply and demand function of a firm. * Pure exchange. Equilibrium prices and allocation. * Leontieff model. | | | | | | | | | |
| Formy dydaktyczne, liczba godzin: | | 1. lectures ...30...; 2. class ...30...; | | | | | | | | | |
| Metody dydaktyczne: | | Problem discussion, solving tasks in teams, examples presented to the class . | | | | | | | | | |
| Wymagania formalne  i założenia wstępne: | | Mathematical analysis, Microeconomics Calculus of one variable, matrix operations | | | | | | | | | |
| Efekty uczenia się: | | Knowledge:  1 knows basic optimization problems in microeconomics, basic functions and microeconomic laws.  2. knows basic models of growth and equilibrium.  3. Student knows economic laws and phenomena  4. Has a profound knowledge of economical sciences and their relation to mathematics. | | | Skills:  1. can apply relevant mathematical tools (differential calculus, difference equations, matrix calculus) to solving optimization problems of microeconomics and analyze basic mathematical models economics  2. can apply differential calculus in marginal analysis and interpret the results. | | | | | Competences:  ……………………..  …………………….. | |
| Sposób weryfikacji efektów uczenia się: | | Two written tests.  Final exam: multiple choice test 20 tasks in 2 sections | | | | | | | | | |
| Forma dokumentacji osiągniętych efektów uczenia się: | | Written tests and exam with grades | | | | | | | | | |
| Elementy i wagi mające wpływ  na ocenę końcową: | | **Class – 50%, Final exam– 50%** | | | | | | | | | |
| Miejsce realizacji zajęć: | | Lecture -lecture hall, class can also be held in a lecture hall | | | | | | | | | |
| Literature :  Hal R. Varian “Microeconomic Analysis” Graduate textbook in microeconomics, W. W. Norton and Company, 1978. Second edition, 1987. Third edition, 1992;  Hal R. Varian “Intermediate Microeconomics: A Modern Approach” Undergraduate textbook in microeconomics. W. W. Norton and Company 1987. Second edition 1990. Third edition 1993. Translated into Spanish, Italian, French, German, Hungarian, Portugese, Polish, Japanese, Chinese. Fourth English edition 1996. Fifth English edition 1999;  Hal R. Varian “Microeconomic Workouts” (with Theodore Bergstrom) Exercises for Intermediate Microeconomics. W. W. Norton and Company, 1987. Second edition, 1990. Third edition 1993. Fourth edition 1996. Translated into Spanish, Italian, German;  Alpha Chiang “Fundamental Methods of Mathematical Economics”, McGraw-Hill UK;  Adam Ostaszewski “Mathematics in Economics”, Blackwell Publishing, 1993.  Martin Anthony, Norman Biggs “Mathematics for Economics and Finance, Methods and Modelling”, Cambridge University Press, 1996 | | | | | | | | | | | |
| UWAGI  . | | | | | | | | | | | |

Wskaźniki ilościowe charakteryzujące moduł/przedmiot:

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| Szacunkowa sumaryczna liczba godzin pracy studenta (kontaktowych i pracy własnej) niezbędna dla osiągnięcia zakładanych dla zajęć efektów uczenia się - na tej podstawie należy wypełnić pole ECTS: | **130 h** |
| Łączna liczba punktów ECTS, którą student uzyskuje na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich lub innych osób prowadzących zajęcia: | **2,5 ECTS** |

Tabela zgodności kierunkowych efektów uczenia się z efektami przedmiotu:

|  |  |  |  |
| --- | --- | --- | --- |
| kategoria efektu | Efekty uczenia się dla zajęć: | Odniesienie do efektów dla programu studiów dla kierunku | Oddziaływanie zajęć na efekt kierunkowy\*) |
| Knowledge 1 | Student knows basic optimization problems in microeconomics, basic functions and microeconomic laws. | K\_W07/ P7S\_WG | 1 |
| Knowledge 2 | Student knows basic models of growth and equilibrium | K\_W10/ P7S\_WG | 3 |
| Knowledge 3 | Student knows economic laws and phenomena. | K\_W13 / P7S\_WK | 1 |
| Knowledge 4 | Has a profound knowledge of economical sciences and their relation to mathematics. | K\_W01 / P7S\_WK | 3 |
| Skills 1 | Can apply relevant mathematical tools (differential calculus, difference equations, matrix calculus) to solving optimization problems of microeconomics and analyze basic mathematical models of economics | K\_U02/P7S\_UW | 2 |
| Skills 2 | Can apply differential calculus in marginal analysis and interpret the results. | K\_U12/ P7S\_UW | 3 |
| Kompetencje - |  |  |  |
| Kompetencje - |  |  |  |

\*)

3 – zaawansowany i szczegółowy,

2 – znaczący,

1 – podstawowy,