

**Dr Eliza Buszkowska**

**Adjunct in the Department of Economic Sciences**

**PROJEKT**

**Syllabus for subject Mathematics on the major Management**

**I. General Information**

1. The name of educational module :  
**Mathematics**
2. Code of module:  
10-MAT-z1-s
3. Type of module:  
**Obligatory**
4. Major:  
**Management**
5. Level of studies (I lub II stopień albo jednolite studia magisterskie):  
**I stopień**
6. Year of studies:  
**First**
7. Semester (zimowy lub letni):  
**Winter**
8. Rodzaje zajęć i liczba godzin:  
**Stacjonarny studies: 45 hours of lecture and 60 gours of exercises .  
Nonstacjonary studies: 20 hours of lacture, 40 hours of exercises**
9. The numer of ECTS points:
10. First and second name , degree, , e-mail:  
**Dr Eliza Buszkowska (eliza\_b2@o2.pl)**
11. Language:  
**Polish**

**II. Detailed Information**

1. The purpose of the module:  
**Thoroughgoing learning by student knowledge from Matrhematics and its aplications in economy.**
2. Introductory requirements in area of knowlage, social skills.  
**Knowledge of mathematics on the level of mature exam (basic level)**
3. Educational effects in the area of knowlage, skills, social skills for the module and the major:

Symbol of effects of education	After examination student can:	Reference to educational effects on the major
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MAT_01	perform operations on matrixes	
MAT_02	calculate derivatives, calculate and make use of differential, calculate elasticity and interpret it, study of variability of function, calculate and interpret partial derivative, know application of derivatives in economy	
MAT_03	apply integral calculus (calculating indefinite and definite integrals, calculating poles of figures, integration by substitution, integration by parts, calculating integrals in infinite interval, application of integrals in economy);	
MAT_04	apply element of linear programming	
MAT_05	apply probability theory (appointing density function distribution function and calculating parameters of probabilisty distribution on the examples of discrete and continous random variable, use distribution arrays, normal distribution analysis)	
MAT_06	Know element sof finansial mathematics ( calculating future and present value of money in condition of state and changing rate of interest appointing effective annual interest rate in condition often capitalization of interest, calculating present and future value of payment flow)	

#### 4. Education contents:

Name of education module: <b>Mathematics (MAT)</b>		
Symbol of educational content	Description of educational content	Reference to educational effects of module
TK_01	Matrix Algebra	MAT_01
TK_02	Differential equation	MAT_02
TK_03	Integral equation	MAT_03
TK_04	Element of linear programming	MAT_04
TK_05	Probability theory	MAT_05
TK_06	Elements of financial mathematics	MAT_06

#### 5. Literature:

H.Augustyniak, Matematyka dla menedżerów, publisher: "Terra", Poznań,  
A.Ostoja -Ostaszewski, Matematyka w ekonomii, Modele i metody,t.1i2, publisher: Wydawnictwo Naukowe PWN, Warszawa  
D.iM.Zakrzewscy, Repetytorium z matematyki dla uczniów szkół średnich i kandydatów na studia, publisher: Wydawnictwo Szkolne PWN,  
R.Antoniewicz, A.Misztal, Matematyka dla studentów ekonomii, publisher: Wydawnictwo Naukowe PWN, Warszawa  
M. Matołka, Matematyka dla ekonomistów, publisher: Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu, Poznań

### III. Additional Information

1. Reference of education effects and education content to the ways of performing classes and methods of evaluation

Name of module: Mathematics			
Symbol of educational effect for module	Symbol of educational contents realized during classes	Ways of performing classes	Methods of evaluation
MAT_01-06	TK_01-06	Lecture and exercises	Written exam, colloquium, additional points for activity on classes

2. ECTS points:

Name of module: <b>Mathematics (MAT)</b>	
Activity form	Medium number of hours on realizing activity
Hours of classes according to a plan of studies with a teacher	stationary studies: 45 hours of lecture and 60 hours of exercises nonstationary studies: 20 hours of lecture wykładowy, 20 hours of exercises
The own work of student Praca własna studenta (all form together)	stationary studies: nonstationary studies:
Hours sum	
Total number of ECTS points for module	

3. Total quantitative indicators :
- Numer of ECTS points, which student obtains on classes demand straightforward share of academic teachers.:
  - Number of points ECTS, which student obtains on practical classes such as exercises:
- Student receive all ECTS points for passing all module Mathematics, for passing with positive note the examination after passing exercises.**

4. Evaluating criterions:

**We apply the following evaluating criterions:**

- understanding problems and ability to solve tasks**
- knowledge of topics presented on lecture and exercises**

***Eliza Buszkowska***