

**COURSE GUIDE**

<u>Subject name</u>	<b>Mathematics I</b>
<u>Course of study</u>	<b>Quality and Production Management</b>
<u>The form of study</u>	<b>Full-time</b>
<u>Level of qualification</u>	<b>First</b>
<u>Year</u>	<b>I</b>
<u>Semester</u>	<b>I</b>
<u>The implementing entity</u>	<b>Department of Statistics and Econometrics</b>
<u>The person responsible for preparing</u>	<b>Anna Wiśniewska-Sałek, PhD</b>
<u>Profile</u>	<b>General academic</b>
<u>Course type</u>	<b>basic</b>
<u>ECTS points</u>	<b>4</b>

**TYPE OF TEACHING – NUMBER OF HOURS PER SEMESTER**

<b>LECTURE</b>	<b>CLASS</b>	<b>LABORATORY</b>	<b>PROJECT</b>	<b>SEMINAR</b>
<b>30</b>	<b>15</b>	<b>-</b>	<b>-</b>	<b>-</b>

## COURSE AIMS

- C1.** To introduce students with the basic methods of solving mathematical problems and mathematical formalization of management engineering problems
- C2.** Acquisition of practical skills in problem solving and interpretation of results from the basics of linear algebra, probability calculus and linear programming

## ENTRY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of mathematics at the high school level
2. The ability to use various sources of information, especially textbooks. Ability to work independently

## LEARNING OUTCOMES

- EU 1** - The student has basic theoretical knowledge from selected branches of mathematics (lecture content)
- EU 2-** Student is able to solve tasks in the field of linear algebra (basic knowledge)
- EU 3-** Student is able to solve tasks in the field of complex numbers (basic knowledge)
- EU 4-** The student is able to analyze tasks in the field of linear programming (basic knowledge)

## COURSE CONTENT

<b>Type of teaching – LECTURE</b>		<b>Number of hours</b>
W 1	Mathematics I - a reminder of the basic information	2
W 2-4	Basics of mathematical operations on matrices (module 1)	6
W 5-6	Matrix – inverse matrix (module 2)	4
W 7-9	Systems of linear equations (module 3)	6
W10-12	Foundations of linear programming (module 4)	6
W13-15	Foundations of linear programming – optimal solutions (module 5)	6
<b>Type of teaching – CLASSES</b>		<b>Number of hours</b>
C 1-5	Matrix – mathematical operations (solving tasks)	5
C 6-8	Systems of linear equations (solving tasks)	3
C 9	Colloquium - linear algebra	1
C 10-11	Foundations of linear programming (solving tasks)	2
C 12-14	Foundations of linear programming – optimal solutions (solving tasks)	3
C 15	Colloquium - foundations of linear programming	1

## TEACHING TOOLS

1. Textbooks and scripts
2. Presentation
3. E-learning platform

## WAYS OF ASSESSMENT (F – FORMATIVE, P – SUMMATIVE)

**F1** Activity on the e-learning platform

**P1** Written test

## STUDENT WORKLOAD

Form of activity	Average number of hours for realization of the activity	
	[h]	ECTS
Contact hours with the teacher	45	1.8
Preparation for classes	17	0.68
Preparation for tests	28	1.12
Consultation	10	0.4
<b>TOTAL NUMBER OF HOURS / ECTS POINTS FOR THE COURSE</b>	<b>100</b>	<b>4</b>

## BASIC AND SUPPLEMENTARY RESOURCE MATERIALS

### Basic resources:

Anholcer M., *Mathematics in economics and management. Examples and exercises*, Wyd. UE w Poznaniu, 2015

Kucharska-Raczunas A., *English for Mathematics for Students of Technical Studies*, Wydaw. Politechniki Gdańskiej, 2015

Chong E.K.P., Żak S.H., *An Introduction to Optimization*, John Wiley and Sons, Inc., New Jersey 2013

### Supplementary literature:

Panek E., *Mathematics in Economics*, Wydaw. Uniwersytetu Ekonomicznego, Poznań 2009  
Wiśniewska-Szałek A., Nowakowska-Grunt J., Szałek R., Skowron-Grabowska B., *The Use of Quantitative Methods in Managing the Process of Creation a Competitive Advantage in the Industrial Region*, [w:] Proceedings of the 12th International Academic Conference. Prague, Czech Republic, 01-04 September, International Institute of Social and Economic Sciences (IIES), Prague 2014

## TEACHERS ( NAME, SURNAME, E-MAIL ADDRESS)

1. Anna Wiśniewska-Szałek (anna.wisniewska-salek@wz.pcz.pl)
2. Agnieszka Noga (agnieszka.noga@wz.pcz.pl)

## MATRIX OF LEARNING OUTCOMES REALISATION

Learning outcome	Reference of given outcome to outcomes defined for whole program	Course aims	Course content	Teaching tools	Ways of assessment
EU 1	K_W01; K_U02; K_K05	C1; C2	L1-L15	1,2,3	F1, P1
EU 2	K_W01; K_U02; K_K05	C1; C2	L2-L6; C1-C5	1,2,3	F1, P1
EU 3	K_W01; K_U02; K_K05	C1; C2	L7-L9; C 6-C9	1,2,3	F1, P1
EU 4	K_W05; K_U09; K_K05	C1; C2	L10-L15; C10-C15	1,2,3	F1, P1

## FORM OF ASSESSMENT – DETAILS

	Grade 2	Grade 3	Grade 4	Grade 5
EU1	The student has not sufficiently learned theoretical knowledge in the field of lectures	The student has sufficiently learned theoretical knowledge in the field of lectures	The student mastered sufficient theoretical knowledge in the field of lectures and can apply it in some problems	The student has sufficiently learned theoretical knowledge in the field of lectures and is able to analyze problems by himself
EU2	The student can not apply the learned practical knowledge to solve elementary problems of linear algebra	The student can apply the learned practical knowledge to solve elementary problems of linear algebra	The student can apply the learned practical knowledge to solve various problems of linear algebra	The student can independently identify the problem and use the right method to solve various problems of linear algebra
EU3	The student can not apply the learned practical knowledge to solve elementary problems of systems of linear equations	The student can apply the learned practical knowledge to solve elementary problems of systems of linear equations	The student can apply the learned practical knowledge to solve various problems of systems of linear equations	The student can independently identify the problem and use the right method to solve various problems of systems of linear equations
EU4	The student can not apply the learned practical knowledge to solve elementary problems of linear programming	The student can apply the learned practical knowledge to solve elementary problems of linear programming	The student can apply the learned practical knowledge to solve various problems of linear programming	The student can independently identify the problem and use the right method to solve various problems of linear programming

## **ADDITIONAL USEFUL INFORMATION ABOUT THE COURSE**

1. Information where presentation of classes, instruction, subjects of seminars can be found, etc. - information is presented to students during classes
2. Information on the place where the classes take place - information available on the website of the Faculty of Management
3. Information on the date of classes (day of the week/hour) - information available on the website of the Faculty of Management
4. Information on consultation hours (hours + place) - given to students during the first classes, information available on the website of the Faculty of Management

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Coordinator