

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Mathematical Decision Making		Code 1011102211010346436
Field of study Safety Engineering - Full-time studies - Second-	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty Ergonomics and Work Safety	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: 30 Laboratory: - Project/seminars: -		No. of credits 4
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art social sciences Economics		ECTS distribution (number and %) 4 100% 4 100%
Responsible for subject / lecturer: dr Piotr Rejmenciak email: piotr.rejmenciak@put.poznan.pl tel. +48 61 665 2812 Faculty of Electrical Engineering ul. Piotrowo 3A, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Students have knowledge of mathematics, particularly calculus and algebra.
2	Skills	Students can determine the extremes of functions of one variable, compute the partial derivatives, operate on matrices. Students can check the basic properties of the relationship.
3	Social competencies	Students are eager to learn.
Assumptions and objectives of the course: The aim of the course is to familiarize students with the different methods that help in making the best decisions.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Students know and understand methods to make optimal decisions. - [K2A-W01, K2A-W04]		
2. Students know a mathematical model and the optimization criterion for the real issues. - [K2A-W01, K2A-W04]		
Skills:		
1. Students are able to formulate a mathematical model of linear and nonlinear programming problems. - [K2A-U1-5, K2A-U10, K2A-U12, K2A-U18]		
2. Students can discuss the real issues of the optimal solution for any changes in the input data. - [K2A-U1-5, K2A-U10, K2A-U12, K2A-U18]		
3. Students can analyze the decision problem in terms of expectations for the results obtained and the amount of work needed to receive. - [K2A-U1-5, K2A-U10, K2A-U12, K2A-U18]		
Social competencies:		
1. Students understand the need and knows the possibilities of lifelong learning. - [K2A-K1, K2A-K3]		
2. Students see the opportunity to use the learned knowledge into practice. - [K2A-K1, K2A-K3]		
Assessment methods of study outcomes		

<p>Formative assessment:</p> <p>a) In regards to classes: on the basis of two written tests.</p> <p>b) Regarding lectures: on the basis of oral or written assignments relating to the material covered during current or previous lectures.</p> <p>Collective assessment:</p> <p>a) In respect to classes: receive 51% of the total points is equivalent to completing the exercise, the assessment "change" every 10 percentage points.</p> <p>b) Considering lectures: the average of formative marks.</p>		
Course description		
<p>? Mathematic programming</p> <p>? Network algorithms: determination of the shortest path in the graph, determination of the maximum flow in the transport network</p> <p>? Transport Problems</p> <p>? Games</p> <p>? Rough set theory;</p> <p>? Relations: orders</p> <p>? Fuzzy set theory</p>		
Basic bibliography:		
<p>1. Grabowski W., Programowanie matematyczne, PWE Warszawa 1980.</p> <p>2. Zangwill W.I., Programowanie nieliniowe, WNT, Warszawa 1974.</p> <p>3. Łachwa A., Rozmyty świat zbiorów, liczb, relacji, faktów, reguł i decyzji, Wydawnictwo EXIT, Warszawa 2001.</p> <p>4. Roy B., Wielokryterialne wspomaganie decyzji, WNT, Warszawa, 1990.</p>		
Additional bibliography:		
<p>1. Simonnard L., Programowanie Liniowe, PWN, Warszawa 1967.</p> <p>2. Kukuła K. (red.), Badania operacyjne w przykładach i zadaniach, PWN, W-wa 2004.</p> <p>3. Lindgren B.W., Elementy teorii decyzji, WNT, Warszawa 1977.</p>		
Result of average student's workload		
Activity		Time (working hours)
1. Participation in lectures		15
2. Participation in exercises		30
3. Consultation		5
4. Preparing for training		15
5. Preparing for colloquia		20
Student's workload		
Source of workload	hours	ECTS
Total workload	85	4
Contact hours	50	2
Practical activities	50	2