

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Metody podejmowania decyzji**
 Name in English: **Decision making methods**
 Main field of study (if applicable): **Control Engineering and Robotics**
 Specialization (if applicable):
 Level and form of studies: **1st level, full-time**
 Kind of subject: **optional**
 Subject code: **ARR042107**
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	30				15
Number of hours of total student workload (CNPS):	90				30
Form of crediting:	crediting with grade				crediting with grade
For group of courses mark (X) final course:					
Number of ECTS points:	3				1
including number of ECTS points for practical (P) classes :					1
including number of ECTS points for direct teacher-student contact (BK) classes:	2.10				0.70

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of basics of control systems, power system protection and control and mathematical statistics.
2. Practical skills of using PowerPoint software.
3. Is able to think and act in a creative way.

SUBJECT OBJECTIVES

- C1. Mastering fundamentals of decision theory and basic approaches to rational and effective decision making as related to automation and control systems.
- C2. Acquiring practical skills of critical assessment of decision making methods as well as presentation of decision problems with Office software.

SUBJECT EDUCATIONAL EFFECTS*relating to knowledge:*

- PEK_W01 Possesses knowledge related to fundamentals of decision theory.
- PEK_W02 Possesses knowledge related to multi-criterial analysis and statistical decision making.
- PEK_W03 Possesses knowledge related to application of intelligent approaches for process control and decision making.

relating to skills:

- PEK_U01 Is able to perform multi-criterial analysis for the problems of wide understood control, with special attention to power system protection and control.
- PEK_U02 Is able to apply selected statistical methods for decision tasks.

relating to social competences:

- PEK_K01 Is able to assess possibility of decision making methods application as well as to present proposed solution with use of Office software.

PROGRAMME CONTENT

Form of classes - lecture		Number of hours:
Lec 1	Introduction. Setting rules of course crediting. Decision situations, decisions and decision making processes, decision procedures and models, rationality and efficiency of decision making, decision analysis, information base for decision making, decision quality.	2
Lec 2	Four decision making stages by Simon – problem identification, design activities, choice making, evaluation.	2
Lec 3	Rationality and decision making – sociological and economical approach to rationality, economical and organizational contexts of decision making.	2
Lec 4	Analytical modeling of the decision situation – decision situation and its model, modeling of the decision making, matter-of-fact model of the decision situation.	2
Lec 5	Multicriterial analysis – basic definitions, survey of the methods for solving of multicriterial analysis tasks.	2
Lec 6	Methods of uncertainty representation – probabilistic models, fuzzy and approximate sets.	2
Lec 7	Decision making based on statistical analysis – statistical hypothesis testing.	2
Lec 8	Introduction to intelligent decision making and control systems.	2
Lec 9	Fuzzy decision making and fuzzy control.	2
Lec 10	Structures of complex and multi-level decision making systems.	2
Lec 11	Adaptive decision making and control systems.	2
Lec 12	Decision making in power system protection and control systems.	2
Lec 13	Examples of intelligent techniques application for identification of events and phenomena analysis in power systems.	2
Lec 14	Comparison of the methods presented, mixed structures, current problems and development trends in control and decision making.	2
Lec 15	Crediting test.	2
Total hours:		30

Form of classes - seminar		Number of hours:
Sem 1	Introduction, setting up rules of crediting, assignment of topics to work on.	2
Sem 2	Presentation of assigned topic related to decision making methods.	12
Sem 3	Summary, crediting.	1
Total hours:		15

TEACHING TOOLS USED

- N1. Informative lecture.
N2. Presentations, problem discussion.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation <i>F - forming (during semester)</i> <i>P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEK_W01 PEK_W02 PEK_W03	Participation in the course.
F2(w)	PEK_W01 PEK_W02 PEK_W03	Crediting test.
P(w)	$P = 0,1F1 + 0,9F2$	
F1(s)	PEK_U01 PEK_U02 PEK_K01	Activity during seminar.
F2(s)	PEK_U01 PEK_U02	Presentation of the seminar problem.
P(s)	$P = 0,2F1 + 0,8F2$	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] Lewandowski, A., Wierzbicki A.P. (Eds.), Aspiration Based Decision Support Systems, Springer Verlag, Berlin 1990
[2] Turban, E., Decision Support and Expert Systems, Prentice-Hall, London 1995

SECONDARY LITERATURE:

- [1] Robbins S., Ehrlich A., Skuteczne podejmowanie decyzji, PWE, Warszawa 2005
[2] Rebizant W., Metody podejmowania decyzji, Skrypt PWr, Wrocław 2012

SUBJECT SUPERVISOR

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**MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
ARR042107 - Decision making methods
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY Control Engineering and Robotics**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)	Subject objectives	Programme content	Teaching tool number
PEK_W01	K1AIR_ASE_W07	C.1	Lec1 Lec2 Lec3 Lec4 Lec14 Lec15	N.1
PEK_W02	K1AIR_ASE_W07	C.1	Lec5 Lec6 Lec7 Lec14 Lec15	N.1
PEK_W03	K1AIR_ASE_W07	C.1	Lec8 Lec9 Lec10 Lec11 Lec12 Lec13 Lec14 Lec15	N.1
PEK_U01	K1AIR_ASE_U07	C.2	Sem1 Sem2 Sem3	N.2
PEK_U02	K1AIR_ASE_U07	C.2	Sem1 Sem2 Sem3	N.2
PEK_K01	K1AiR_K03 K1AiR_K09	C.2	Sem1 Sem2 Sem3	N.2