

## DESCRIPTION OF THE COURSES

- Course code: ARR2107
- Course title: DECISION MAKING METHODS
- Language of the lecture: Polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	2				
<i>Number of hours/semester*</i>	30				
<i>Form of the course completion</i>	pass				
<i>ECTS credits</i>	2				
<i>Total Student's Workload</i>	60				

- Level of the course (basic/advanced): ): advanced
- Prerequisites:
  
- Name, first name and degree of the lecturer/supervisor:  
Waldemar Rebizant, Ph. D., D. Sc.
- Names, first names and degrees of the team's members:  
Mirosław Łukowicz, Ph. D.  
  
Daniel Bejmert, M. Sc.
- Year: 4      Semester: 7
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):  
As an effect of the course the students should obtain the basic knowledge on decision processes and the most popular approaches used in decision making for developing rational and efficient decisions in power system control and protection systems.
- Form of the teaching (traditional/e-learning): traditional
- Course description:  
The course presents the theory of decision making, methods of multicriterial analysis, application of statistical methods for decision tasks, utilization of intelligent methods (including fuzzy logic) for control and decision making. Examples of the application of described decision methods deal with various problems of control systems, with special attention paid to power system control and protection. Adaptive protection schemes as well as protection and control systems with learning abilities are also presented.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
<i>1. Introduction – 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.</i>	2

2. <i>Four decision making stages by Simon – problem identification, design activities, choice making, evaluation.</i>	2
3. <i>Rationality and decision making – sociological and economical approach to rationality, economical and organizational contexts of decision making.</i>	2
4. <i>Analytical modeling of the decision situation – decision situation and its model, modeling of the decision making, matter-of-fact model of the decision situation.</i>	2
5. <i>Multicriterial analysis – basic definitions, survey of the methods for solving of multicriterial analysis tasks.</i>	2
6. <i>Methods of uncertainty representation – probabilistic models, fuzzy and approximate sets.</i>	2
7. <i>Decision making based on statistical analysis – statistical hypothesis testing.</i>	2
8. <i>Introduction to intelligent decision making and control systems.</i>	2
9. <i>Fuzzy decision making and fuzzy control.</i>	2
10. <i>Structures of complex and multi-level decision making systems.</i>	2
11. <i>Decision making support systems and contemporary information systems – decision support system structure and its components.</i>	2
12. <i>Adaptive decision making and control systems.</i>	2
13. <i>Decision making in power system protection and control systems.</i>	2
14. <i>Examples of intelligent techniques application for identification of events and phenomena analysis in power systems.</i>	2
15. <i>Comparison of the methods presented, mixed structures, current problems and development trends in control and decision making.</i>	2

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
- Project – the contents:
- Basic literature:
  - [1] Szapiro T., Co decyduje o decyzji, WNT Warszawa 1993.
  - [2] Walker P., Podejmowanie decyzji i rozwiązywanie problemów, w: Praktyka kierowania, Warszawa 1994.
  - [3] Robbins S.P., Skuteczne podejmowanie decyzji, PWE, Warszawa 2005.
  - [4] Heilpern S., Podejmowanie decyzji w warunkach ryzyka i niepewności, WAE, Wrocław, 2001.
- Additional 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.
- Conditions of the course acceptance/creditation:

\* - depending on a system of studies