

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND  
TECHNOLOGY**

**SUPERVISOR/TEAM/ DECLARING/CONDUCTING COURSE:** dr hab. inż. Adam Kasperski, prof. uczelni

**DEPARTMENT:** Department of IT and Management W8

**SCIENTIFIC DISCIPLINE:** Technical information and telecommunications

**COURSE CARD**

**Course name in Polish:** Programowanie Liniowe

**Course name in English:** Linear Programming

**Course language:** English

**The course is intended for all PhD students:** YES / NO

**1) BASIC COURSE**

**~~2) SPECIALIST COURSE~~**

**~~3) SEMINAR~~**

**~~4) HUMANISTIC COURSE~~**

**~~5) LANGUAGE~~**

**Subject code:** ITQ100076W

\* delete as applicable

	Lecture			
Number of hours of organized classes in university (ZZU)	30			
Grading	Crediting with grade			
Number of ECTS points	0			

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. Linear algebra
2. Elements of logic
3. Basic skills in computer programming

**COURSE OBJECTIVES**

- C1. Showing various applications of linear programming.
- C2. Presenting various methods of building linear programming models.
- C3. Presenting basic algorithms used in linear programming.

**PROGRAM CONTENTS**

<b>Form of classes – lecture (Lec)</b>		<b>Number of hours</b>
Lec1	Introduction to linear programming	2
Lec2	Applications of linear programming (model building)	2

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Lec3	Applications of linear programming (model building)	2
Lec4	Theory of linear programming	2
Lec5	The simplex algorithm	2
Lec6	Duality and sensitivity analysis	2
Lec7	Theory of linear integer programming	2
Lec8	Branch and bound and cutting plane algorithms	2
Lec9	Network flows	2
Lec10	Network simplex algorithm	2
Lec11	Solving large-scale models (decomposition algorithms)	2
Lec12	From linear programming to exact and approximation algorithms	2
Lec13	Robust linear programming	2
Lec14	Complexity of linear programming	2
Lec15	Written test	2
	<b>Total hours:</b>	<b>30</b>

**TEACHING TOOLS USED**

N1. Traditional method, presentation

**ACHIEVED SUBJECT LEARNING OUTCOMES**

Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	P8S_WG	Written test
Skills	P8S_UW	Written test

**PRIMARY AND SECONDARY LITERATURE**

**PRIMARY LITERATURE:**

- [1] M.S. Bazaraa, J. J. Jarvis, H.D. Sherali. Linear Programming and Network Flows. Wiley 2010
- [2] R. Ahuja, T. Magnanti, J. Orlin. Network Flows. Theory, Algorithms and Applications. Prentice Hall 1993
- [3] C. Papadimitriou, K. Steiglitz. Combinatorial Optimization. Dover 1998.

**SECONDARY LITERATURE:**

- [1] A. Shrijver. Theory of Linear and Integer Programming. Wiley 1986
- [2] B. Kolman. R. E. Beck. Elementary Linear Programming with Applications. Elsevier Science & Technology Books 1995

**SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)**

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