STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Computer Methods and Computer Aided Design**		Code **1010115121010110267**
Field of study **Civil Engineering Extramural Second-cycle**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 2**
Elective path/specialty **Construction Engineering and Management**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **part-time**	
No. of hours Lecture: **15** Classes: **-** Laboratory: **15** Project/seminars: **-**		No. of credits **3**
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 **technical sciences** **Technical sciences**		ECTS distribution (number and %) **3 100%** **3 100%**

Responsible for subject / lecturer:

dr inż. Marcin Gajzler
email: marcin.gajzler@put.poznan.pl
tel. 61 6652190
Wydział Budownictwa i Inżynierii Środowiska
ul. Piotrowo 5 60-965 Poznań

Responsible for subject / lecturer:

mgr inż. Michał Rutkowski
email: michal.rutkowski@put.poznan.pl
tel. 61 6652473
Wydział Budownictwa i Inżynierii Środowiska
ul. Piotrowo 5, 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	The student knows the basics of probability theory and methods for solving linear equations and inequalities at KRK5 knows computer skills, basic methods of searching databases and search engines know the basics plotting CAD programs, knows the basis for planning construction projects
2	**Skills**	The student is able to operate a computer, to formulate a mathematical model for the task with the content - at KRK5, knows how to use programs like CAD, can use the virtual library resources online, can identify the basic elements of the project, the structure of processes and assign resources to these processes
3	**Social competencies**	The student is aware of the need to know methods to assist in solving the problems of decision-making related to planning the course of the work, carry out investments and making changes in their operations. Should be sensitive to the correct technical solutions consistent with the principles of design.

Assumptions and objectives of the course:

Knowledge of software and methods for troubleshooting decision-making based on operational research. Understanding our ability to successfully assist in the planning of construction projects. Knowledge of methods and tools for graphics processing and visualization

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. The student knows the chosen methods of operations research (linear programming, the transport issue and allocative) using engineering construction projects - [K_W08]
2. The student knows the basic capabilities of software for planning construction projects - [K_W08]
3. The student knows the methods of graphics processing and visualization - [K_W08]

Skills:

1. Student, using methods of operations research and computer applications, it can identify the solution for optimization problems: choice of assortment and allocation of means of production, the choice of process technology, production and warehouse management and investment location - [K_U13, K_U17]
2. Student is able to plan the course work using the software to plan and carry out analysis time and costs using this software - [K_U10]
3. The student can use all available tools in the field of graphic processing and visualization - [K_U05]

Social competencies:

1. Student knows possibilities of use and may also propose the use of operations research methods in engineering practice - [K_K03]
2. Student understands what the cooperation and is ready to cooperate with the various participants in the decision-making process - [K_K01]
3. student is aware and is able to convey what is the role and the possibilities of application software for planning construction projects - [K_K03]

Assessment methods of study outcomes

Lectures: written test consisting of two parts. Part 1 is designed to test the knowledge and consists of answers to 6 questions. Part 2 is designed to test the skills and involves solving one task. Quarter. in the computer laboratory - they include the completion of each of several tasks solved with the use of dedicated software. The student is required to demonstrate knowledge of the software and to present solution of the problem using this software.

The grading scale determined% of:

90 bardzo dobra (A)

85 dobra plus (B)

75dobra (C)

65 dostateczna plus (D)

51 dostateczna (E)

poniżej 51 niedostateczna (F)

Course description

The genesis of operational research, linear programming methods - the method of 2D and 3D graphics, basic simplex method, duality in linear programming, transportation problem. The basic principles of project management. Project management software. Tools supporting graphic processing, and visualization.

Basic bibliography:

1. Badania operacyjne w przykładach i zadaniach. Red. Kukuła K. PWN, Warszawa 1993
2. Teoria podejmowania decyzji - wstęp do BO. Sadowski W, PWE, Warszawa 1976
3. MS Project 2010 - Efektywne zarządzanie projektem i portfelem projektów, S. Wilczewski, Helion, Gliwice, 2011
4. Zarządzanie projektami z wykorzystaniem darmowego oprogramowania, P. Wróblewski, Helion, Gliwice, 2009

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Udział w wykładach	15
2. Udział w ćwiczeniach w laboratorium komputerowym	15
3. Przygotowanie ćwiczeń laboratoryjnych	23
4. Przygotowanie do zaliczenia wykładów	20
5. Udział w konsultacjach	2

Student's workload

Source of workload	hours	ECTS
Total workload	75	3
Contact hours	32	1
Practical activities	40	2