POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)
pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Informatics in Engineering Design

Course

Field of study	Year/Semester
Environmental Engineering	1 / 1
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	30	
Tutorials	Projects/seminars	

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

Rafał Brodziak PhD

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Faculty of Environmental Engeeniering and
Energy

Berdychowo 4, 61-131 Poznań

Responsible for the course/lecturer:

Prerequisites

1. Knowledge:

Basic information on computer science from high school.

2. Skills:

Personal computer support, including basic knowledge of office programs.

3. Social competencies:

Awareness of the need to constantly update and supplement knowledge and skills.

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Course objective

The aim of the course is to acquaint the student with the issues of using IT tools and techniques for project works in the field of environmental engineering. The course covers issues of collecting, gathering, storing and processing information, as well as performing engineering calculations, using design support tools, including familiarizing with the environment and the basics of programming languages. Developing a system approach to problem solving, using the possibilities of computer tools in the context of environmental engineering tasks.

Course-related learning outcomes

Knowledge

1. Student knows the principles of engineering design (obtained during the lecture and laboratory exercises - [[KIS_W07]]

2. Student understands the principles of data storage and processing in computer systems (obtained during lectures and laboratory exercises) - [[KIS_W07]]

3. Student knows the use of spreadsheet in engineering activities - [[KIS_W07]]

4. Student knows the general features and applications of application programs for numerical simulations - [[KIS_W07]]

5. The student knows the basic programs for engineering calculations in Environmental engineering - [[KIS_W07]]

6. Student knows the basics of programming in Visual Basic - [[KIS_W07]]

Skills

1. Student uses modern computer technology to collect, collect and process data and information - [[KIS_U02]]

2. Student is able to choose the right application for the environmental engineering task - [[KIS_U04]]

3. Student is able to use computer aided design methods for professional activity - [[KIS_U04]]

4. Student can create a macro command in Excel - [[KIS_U04]]

Social competences

1. The student is aware of the responsibility for their own work - [[KIS_K02]]

2. The student is oriented on obtaining information on new tools - [[KIS_K02]]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lectures (Study outcomes KIS_W07, KIS_K02)

Multiple choice test with open questions, carried out in the last class. Credit threshold: 50%. Detailed scoring criteria and scale of grades are given before the exam.

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Laboratory exercises (Study outcomes KIS_W07, KIS_U02, KIS_U04, KIS_K02)

Two final computer tests, the first in the middle of the semester, the second in the last class. Credit threshold: 50%. Detailed scoring criteria and scale of scores are given before passing.

Programme content

Basic information on the principles of engineering design and the use of computer methods in design: Factors and basic activities in the design process, Elements of system engineering, Structure of the design process, Computer aided design, Numerical methods, modeling and simulation, IT systems: categories and types, Introduction to database systems, Decision support, Standards and modeling tools (including BIM), Basics of programming languages (elements of programming language, Decision structures, Loops, Tables, Procedures and functions).

Laboratory classes include two modules:

- practical application of spreadsheets

- VBA programming (i.e. creating macros, user functions and forms) for engineering calculations.

Teaching methods

Traditional lecture with elements of case study problem and multimedia presentation.

Laboratories: execution of the tasks set by the teacher - practical exercises.

Bibliography

Basic
1. Walkenbach J., Excel 2013 PL. Programowanie w VBA, Wydawnictwo Helion, 2013

2. Treichel W., Visual basic dla studentów. Podstawy programowania w Visual Basic 2010. Wydawnictwo WITKOM, 2011

3. Gąsiorek E., Podstawy projektowania inżynierskiego, Wydaw. Akademii Ekonomicznej Wrocław, 2006

4. Kwiatkowska A.M., Systemy wspomagania decyzji. Jak korzystać z wiedzy i informacji, Wydawnictwo Naukowe PWN, 2007

5. Kwietniewski M. , GIS w wodociągach i kanalizacji, Wydawnictwo Naukowe PWN, 2008.

Additional
1. Gutenbaum J.: Modelowanie matematyczne systemów. Akademicka Oficyna Wydawnicza EXIT,2003

2. Paul Beynon-Davies, Systemy Baz Danych, Wydawnictwa Naukowo-Techniczne, 2000

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Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	60	2,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam)	40	1,5