

MODULE INFORMATION SHEET

Name of Module Unit	Information Technology
Name in polish language	Podstawy informatyki
Module type	compulsory
Form of studying	full-time day courses
Level of study	undergraduate course (B.Sc. level)
Type of study (for extra-mural courses)	-
Programme	Environmental Engineering
Speciality	Environmental Engineering
Responsible department	Department of Informatics and Environment Quality Research
Responsible person	dr inż Witold Sikorski

Semester	Lectures(E)	Tutorials	Laboratory	Computer Exercises	Projects	ECTS
2	15			30		3

Objectives (summary)

Basic knowledge on computer architecture and software. Information theory basics, coding techniques and codes (ASCII, Unicode, fixed point and floating point coding, image coding, compression, encryption). Data in files and folders. Basic information on computer networks and security.

Algorithms basics. Mathematical and graphical presentation of algorithms. From algorithm to program – basics of computer programming.

Exercises concern word-processing techniques and spreadsheets (basic functions, charts, basic database commands in spreadsheets, reporting and pivot tables). Visual Basic for Applications as an example of programming methods, with application in spreadsheets. Example of a presentation.

Prerequisites

Basic high school knowledge

Rules of integrated grade setting

Average of Lectures and Computer Exercises grade with preference of Lectures in the case of average of 3,75 or 4,75.

Recommended readings

Contents of lectures (syllabus)

	Topics	Time (hrs.)	Scope (S / Ex)
1	Computer architecture basics. Hardware elements – memory classification. Information storage. Data in files and folders. Software – operating systems, applications	2	S
2	Information measures. Coding techniques and codes. Character coding – ASCII, Unicode. Image coding and color presentation. Data compression. Encryption systems and application.	2	S
3	Decimal, binary and hexadecimal numbers. Numerical codes: fixed point numbers, negative numbers, floating point numbers. Absolute and relative error in computations	2	S/E
4	Computer networks – cable and wireless. Transmission basics. Information security (files, mail, Internet)	2	S
5	Algorithms basics. Mathematical and graphical presentation of algorithms. Types of algorithms – simple, branched, looped (known number of steps – matrixes, unknown number of steps (iterations).	2	E
6	From algorithm to program – basics of computer programming. Programming languages. Basic types statements in programming languages.	2	E
7	Data in problem solving. Data placement in algorithm and programs. Basic data types. Data – algorithm – solution.	2	S
8	Test	1	
Total		15	hours

S – topics listed in the legal study programme standards from 12.07.2007

Ex – extended topics

Lecturers

dr inż Witold Sikorski

Assessment method

Homework – preparation of an algorithm in graphical format (40%) Test (60%)
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Contents of computer exercises

	Topics	Time (hrs.)	Scope (S / Ex)
1	Word processing – how to organize a multi page document	2	S
2	Spreadsheets in engineering applications – addressing, tables, functions, charts.	2	S
3	Data processing in a spreadsheet	2	S
4	Spreadsheet as a database tool	2	S
5	Macros in spreadsheet	2	S
6	Large files processing – reports, pivot tables	2	S
7	Individual presentation in Power Point or similar tool	2	S

8	Introduction to Visual Basic environment. I/O procedures	2	Ex
9	Conditional statements	2	Ex
10	Looping statements	2	Ex
11	Matrixes in computing	2	Ex
12	Visual Basic for Application in spreadsheet – macro as a program	2	S
13	Visual Basic for Application in spreadsheet – sample application	2	Ex
14	Programming in engineering – application examples	2	S
15	Ending test	2	S
Total		30	hours

S – topics listed in the legal study programme standards from 12.07.2007

Ex – extended topics

Persons responsible for computer exercises

dr inż. Witold Sikorski dr inż. Wiktor Treichel
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Assessment method for computer exercises

Ad hoc tests at the end of each group of topics. Final test on understanding of programming techniques.
