



MODULE SPECIFICATION

Module code	
Module title in Polish	Podstawy informatyki
Module title in English	The Fundamentals of Computer Science
Module running from the academic year	2016/2017

A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	Environmental Engineering
Level of qualification	first cycle (first cycle, second cycle)
Programme type	academic (academic/practical)
Mode of study	full-time (full-time/part-time)
Specialism	All
Organisational unit responsible for module delivery	The Department of Applied Computer Science
Module co-ordinator	Paweł Stąpór, PhD, Eng
Approved by:	

B. MODULE OVERVIEW

Module type	core module (core/programme-specific/elective HES*)
Module status	compulsory module (compulsory/optional)
Language of module delivery	Polish, English
Semester in the programme of study in which the module is taught	semester 1
Semester in the academic year in which the module is taught	Winter semester (winter semester/summer semester)
Pre-requisites	None (module code/module title, where appropriate)
Examination required	(Yes/No) No
ECTS credits	3

* elective HES – elective modules in the Humanities and Economic and Social Sciences



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Mode of instruction	lectures	classes	laboratories	project	others
Total hours per semester	15		15		



C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to broaden students' knowledge with respect to the selected information issues, such as: the elements of information encryption, the elements of gathering and processing information, and the elements of programming.
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Module outcome code	Module learning outcomes	Mode of instruction (l/c/lab/p/ others)	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student has knowledge as regards general computer science (including the on technical methods of gathering, encrypting, and processing information (as well as building algorithms and programming).	I	IŚ_W05	T1A_W01, T1A_W05, T1A_W07, T1A_W10
W_02	A student is familiar with the selected computer programs supporting computations and designing.	I	IŚ_W05	T1A_W07
U_01	A student can consciously utilise computer software in data analysis and engineering computations.	I	IŚ_U12	T1A_U08, T1A_U09, T1A_U15,
U_02	A student can use databases.	I	IŚ_U02	T1A_U01, T1A_U05, T1A_U07,
K_01	A student is aware of the responsibility for the results of his/her work as well as the work of the team.	II	IŚ_K01 IŚ_K02 IŚ_K05	T1A_K02, T1A_K03 T1A_U04, T1A_U05,
K_02	A student understands the necessity and knows the possibilities of continuous education as well as raising his/her competences.	II	IŚ_K03 IŚ_K09	T1A_K01 T1A_K02 T1A_K04

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1	Introduction: the essence of computer science. The elements of information encryption: numerical systems, information units, a record of negative and real numbers in the binary system.	W_01
2	Computer systems of supporting engineering calculations.	W_02, K_01, K_02
3	Introduction to programming: the stages of creating programs, programming languages. The concept of algorithm, block diagrams, the division of algorithms, and the effectiveness of algorithms. The algorithms of summing and sorting data.	W_01 K_01, K_02
4,5	Introduction to numerical methods, the algorithms of sample numerical methods: solving systems of linear equations, calculating the roots of functions, numerical integrating, function approximation and interpolation.	W_02 K_01, K_02
6,7	Basic information on databases. A relational model of databases, a logic and physical diagram of databases, and entity diagrams. Introduction to SQL language.	W_01, K_01, K_21



2. Topics to be covered in the classes

3. Topics to be covered in the laboratories

No.	Topics	Module outcome code
1	Introduction to Excel, a sample solution to data approximation.	U_01 K_01,K_02
2	Sample applications of Excel in statistical analysis of measurement data.	U_01 K_01,K_02
3	Introduction to Mathcad; vector and matrix computations in Mathcad.	U_01 K_01,K_02
4,5	Sample applications of Mathcad for solving linear and non-linear equations; calculating the roots of a functions; numerical integration, function approximation and interpolation.	U_01 K_01,K_02
6,7	A project on a relational database, introduction to the SQL language.	U_02 K_01,K_02

Assessment methods

Module outcome code	Assessment methods <i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i>
W_01 W_02	A test
U_01 U_02	Correct completion of tasks/reports
K_01 K_02	A final test (a practical test)



D. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	Study time/ credits
1	Contact hours: participation in lectures	15
2	Contact hours: participation in classes	
3	Contact hours: participation in laboratories	15
4	Contact hours: attendance at office hours (2-3 appointments per semester)	4
5	Contact hours: participation in project-based classes	
6	Contact hours: meetings with a project module leader	
7	Contact hours: attendance at an examination	
8		
9	Number of contact hours	34 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1,36
11	Private study hours: background reading for lectures	8
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	8
14	Private study hours: preparation for laboratories	10
15	Private study hours: writing reports	7
16	Private study hours: preparation for a final test in laboratories	8
17	Private study hours: preparation of a project/a design specification	
18	Private study hours: preparation for an examination	
19		
20	Number of private study hours	41 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1,64
22	Total study time	75
23	Total ECTS credits for the module <i>(1 ECTS credit =25-30 hours of study time)</i>	3
24	Number of practice-based hours <i>Total practice-based hours</i>	40
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1,60

E. READING LIST

References	
	<ol style="list-style-type: none">1. Douglas Faires, Richard L. Burden, Numerical Methods, PWS-KENT, 19932. Jeffrey D. Ullman, Jennifer Widom, Database Systems: The Complete Book, Pearson Education, 20093. Maxfield Brent, Essential PTC Mathcad Prime 3.0 A Guide for New and Current Users, ACADEMIC PRESS, 20134. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein Introduction to Algorithms, The MIT Press Cambridge, Massachusetts, 20095. Wayne Winston, Microsoft Excel Data Analysis and Business Modeling, Microsoft Press, 2013



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	6. Whitehorn M., Marklyn B. Inside Relational Databases, Springer, 2001
Module website	