SYLLABUS

Name: *IT and Introduction to Programming (BudAB>SI1ITINPR19)*
Name in Polish:
Name in English: *IT and Introduction to Programming*

Information on course:

Course offered by department: Faculty of Civil Engineering
Course for department: Silesian University of Technology

Default type of course examination report:

ZAL

Language:

English

Course homepage:

https://platforma.polsl.pl/rb/course/view.php?id=545

Short description:

The subject covers issues related to the basics of computer science and computer programming.
The course consists of 15 hours of lectures and 45 hours of laboratory during which students learn how to use SMath Studio and solve basic problems using CAS systems. During laboratories students learn also how to write simple application in Pascal programming language (Lazarus environment).

Description:

LECTURES - 15 hours
Lectures covers the following topics:
1. Data in IT and data management: Data, text and binary files, text coding, unicode (UTF systems), text formats: txt, csv, rtf, html, xml, json; Graphic formats – bitmap, compression, vector graphics, formats used for graphic data exchange.
2. Math programs for engineers (MathCad/SMath Studio environment): range variables and arrays, operations on matrices, units, functions, calculus and derivatives in mechanical problems – symbolic and numerical calculations, graphs.
3. Computer programming: interpreters and compilers, languages (similarities and differences), syntax, Pascal, .NET Framework, Python, VBA.
4. Programming IDE: RAD systems, building application interface, events driven applications, adding components on form, types of components, object inspector, debug code, breakpoints, stack.
5. Data types in programming: predefined and user-defined data types, naming conventions, numbers representation, local and global variables, constants, arrays, lists, records, functions (methods), classes and objects, events; functions arguments – transfer data by value or reference; enumerated types, open arrays, streams, files.
6. Program organization in Pascal: syntax, block statement, conditional statements in Pascal (if, case), loops (for, while, repeat), code compilation, protected mode and exceptions (try – except), removing errors – debugging code, trace.
7. Building algorithms and organization of the code: splitting task into simple problems, units and reference to units, interface and implementation, overloading.

LABORATORIES - 45 hours
1. Solving mathematical/engineering problems with CAS system (SMath Studio),
2. Elaboration of algorithm and program code for individual problem (related to mechanics, physics, geometry) in Pascal language (Lazarus IDE).

Bibliography:

LITERATURE
[1] Borland Delphi 4 in 21 Days, Macmillan Computer Publishing, 2008
[2] M. Cantu: Mastering Delphi 6, Sybex, 2001
[3] G. Wandzik: IT and Introduction to programming, teaching materials, 2020.

ADDITIONAL RESOURCES:
[4] web page: https://www.embarcadero.com/resources.
[5] web page : https://en.smath.com/view/SMathStudio/summary.

Learning outcomes:

SKILLS
(1) Ability to formulate and solve problems and selection of appropriate tool - [course effect K1A_U14].
(2) Ability to make critical analysis of mathematical problems - [course effect K1A_U14].

Assessment methods and assessment criteria:

PRELIMINARY REQUIREMENTS:
No preliminary requirements

REQUIREMENTS:
(1) Active presence in laboratories.
(2) Solution of problem and elaboration of the simple code in Pascal language.
(3) Passing the colloquium covers topics discussed during lectures and laboratories.

FINAL ASSESSMENT:
40% (colloquium), 60% (laboratory).

POSSIBILITY OF TRANSFERRING GRADES:
To transfer partial grades, students should contact the lecturer within the first two weeks of the semester.

The syllabus is valid from the winter semester of the 2025/2026 academic year, and its content is not subject to change during the semester.

Element of course groups in various terms:

Course group description	First term	Last term
missing group description in English (BudAB-S1-2019-sem1)	2020/2021-Z	

Course credits in various terms:

<without a specific program>			
Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	5	2020/2021-Z	