GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Programming Languages, PG_00047657 | | |
| Field of study | Informatics | | |
| Date of commencement of studies | October 2021 | Academic year of realisation of subject | 2022/2023 |
| Education level | first-cycle studies | Subject group | Obligatory subject group in the field of study |
| Mode of study | Full-time studies | Mode of delivery | at the university |
| Year of study | 2 | Language of instruction | Polish |
| Semester of study | 3 | ECTS credits | 3.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Algorithms and Systems Modelling -> Faculty of Electronics, Telecommunications and Informatics | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Piotr Mironowicz | |
| | Teachers | dr Magdalena Godlewska<br>dr inż. Piotr Mironowicz | |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 15.0 | 0.0 | 0.0 | 15.0 | 0.0 | 30 |
| | E-learning hours included: 0.0 | | | | | | |

| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | Self-study | SUM |
|---|---|---|---|---|---|
| | Number of study hours | 30 | 3.0 | 42.0 | 75 |

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| Subject objectives | Student learned popular programming paradigms and learned to use them. |

## Learning outcomes

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K6_W05] Knows and understands, to an advanced extent, methods of supporting processes and functions, specific to the field of study | The student knows conceptually and historically relevant programming languages such as Modula, Ada, Smalltalk, Haskell, and Prolog. He is aware of what problems underlied particular solutions. | [SW3] Assessment of knowledge contained in written work and projects |
| [K6_U41] can produce, test or evaluate software using modern programming platforms, tools, languages and paradigms of different levels, as well as use software packages supporting scientific and research processes as well as business decision-making processes and teamwork | He can program in the languages of procedural and object paradigm (Modula, Smalltalk), functional (Haskell) and in logic (Prolog). Knows environments and packages supporting programming. | [SU4] Assessment of ability to use methods and tools |
| [K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment | The student is able to codea solution to a specified problem using the properties of the selected programming paradigm. He recognizes which of the modeling approaches will be most appropriate for the given problem. | [SU1] Assessment of task fulfilment |
| [K6_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices | The student is familiar with all important programming paradigms and their importance for the principles of software development. He understands the relationship between high-level languages and the specificity of microprocessors. | [SW1] Assessment of factual knowledge |

## Subject contents

1. Procedural programming.
2. Linear syntax. FORTRAN
3. Activation records and subroutines
4. Recursive procedure call.
5. Block syntax. Control flow abstraction.
6. Binding of the names with objects. Range bonds.
7. The parameters of the procedure call.
8. Activation records for languages with recursion.
9. Static and dynamic calls. ALGOL. PASCAL.
10. Restrictions of block languages.
11. Abstraction of data and access protection.
12. Modularization. Modula-2. ADA83, ADA95
13. Exceptions. Exception handling models.
14. Concurrent procedures. Rendezvous.
15. Object-oriented programming. Objects, classes, hierarchies.
16. Dynamic types. Polymorphism. Smalltalk. C + +.
17. Recursive interpreted commands.
18. Symbolic transformation. Tail recursion.
19. LISP. Atoms and lists.
20. Functional programming. Haskell, XSL.
21. Reduction, filtering and casting.
22. Lambda calculus.
23. Memory management in LISP systems
24. Programming in logic. Prolog.

## Prerequisites and co-requisites

## Assessment methods and criteria

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Tests | 50.0% | 40.0% |
| Project | 50.0% | 60.0% |

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| Recommended reading | Basic literature | S. Mangano: XSLT receptury, wyd.2, Helion 2007<br>Cincom Smalltalk Downloads, http://www.cincomsmalltalk.com/<br>SAXON - The XSLT and XQuery Processor, http://saxon.sourceforge.net/<br>W.F. Clocksin, W.F., Mellish, C.S.: Prolog Programowanie. Helion 2003<br>Ada Programming, http://en.wikibooks.org/wiki/Ada<br>SWI-Prolog downloads, www.swi-prolog.org/download.html<br>ADA Core, the GNAT Pro Company, http://www.adacore.com/home, https://libre.adacore.com/<br>D. S. Touretzky: Common Lisp: A Gentle Introduction to Symbolic Computation, http://www.cs.cmu.edu/~dst/LispBook/<br>Z. Huzar, Z. Fryźlewicz, I. Dubielewicz, B. Hnatk: Ada 95, Helion 1998<br>Polski serwis języka Smalltalk, http://www.objectspace.net/ |
| | Supplementary literature | http://en.wikipedia.org/wiki/Programming_paradigm |
| | eResources addresses | Adresy na platformie eNauczanie:<br>Języki Programowania - 2022/23 - Moodle ID: 25342<br>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25342 |
| Example issues/ example questions/ tasks being completed | | |
| Work placement | Not applicable | |