



Subject card

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|---|---|---|-------------------------------------|------------|---------|--|-----|
| Subject name and code | Programming, PG_00021027 | | | | | | |
| Field of study | Mathematics | | | | | | |
| Date of commencement of studies | October 2026 | Academic year of realisation of subject | | | | 2026/2027 | |
| Education level | first-cycle studies | Subject group | | | | Obligatory subject group in the field of study Subject group related to scientific research in the field of study | |
| Mode of study | Full-time studies | Mode of delivery | | | | at the university | |
| Year of study | 1 | Language of instruction | | | | Polish | |
| Semester of study | 2 | ECTS credits | | | | 5.0 | |
| Learning profile | general academic profile | Assessment form | | | | assessment | |
| Conducting unit | Department of Probability Theory and Biomathematics -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Paweł Wojda | | | | | |
| | Teachers | | | | | | |
| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 30.0 | 0.0 | 30.0 | 0.0 | 0.0 | 60 |
| | 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 | 60 | 5.0 | 60.0 | 125 | | |
| Subject objectives | Mastering the ability to write simple algorithms in the selected programming language; compiling, starting and testing simple programs. Mastering the skill of analyzing simple algorithms. | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | | Method of verification | |
| | K6_W08 | Student: - recognizes elements of programs and explains their meaning - enumerates program quality criteria. | | | | [SW1] Assessment of factual knowledge | |
| | K6_U07 | Student: - designs simple algorithms and their tests. | | | | [SU4] Assessment of ability to use methods and tools | |
| | K6_W09 | Student: - uses software development tools for C/C++, - uses internet to find information about C/C++ and programming | | | | [SW1] Assessment of factual knowledge | |
| | K6_K03 | Student in laboratory: - implements three independent programs. | | | | [SK2] Assessment of progress of work [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work | |

| Subject contents | <p>Course content – lecture Lecture:</p> <p>1. Numbers in computer systems: Computer memory. Integer numbers. Floating-point numbers. Vectors and matrices.</p> <p>2. Iteration: Processor. Conditional instruction. Switching instruction. Loops. Optimization. Searching a number and sorting numbers. Horner algorithm. Disc file operations. Algorithm complexity. Good style of programming. Program testing.</p> <p>3. Alphabet and text: ASCII code and UNICODE. Characters. Strings. Searching and sorting of strings.</p> <p>4. Procedures and functions: Definition, parameters and local variables. Library of functions. Projects. Recursive algorithms</p> <p>5. Data structures: Definition of data structure. Dynamic memory management . Application of data structures</p> <p>6. Class and object: Class definition and application. Object. Constructor. Overloaded methods and operators. "Friend" functions. Inheritance.</p> <p>Laboratory:</p> <p>Implementation of iteration algorithm, program with own functions with teacher help. Five programs without teacher care.</p> | | | | | | | | | | | |
|--|--|--|--|--------------------------|-------------------|-------------------------------|--------------|-------|-------|--------------------|-------|-------|
| Prerequisites and co-requisites | | | | | | | | | | | | |
| Assessment methods and criteria | <table border="1"> <thead> <tr> <th data-bbox="451 1032 794 1066">Subject passing criteria</th> <th data-bbox="794 1032 1137 1066">Passing threshold</th> <th data-bbox="1137 1032 1487 1066">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 1066 794 1099">Lecture test</td> <td data-bbox="794 1066 1137 1099">50.0%</td> <td data-bbox="1137 1066 1487 1099">20.0%</td> </tr> <tr> <td data-bbox="451 1099 794 1137">Practical exercise</td> <td data-bbox="794 1099 1137 1137">50.0%</td> <td data-bbox="1137 1099 1487 1137">80.0%</td> </tr> </tbody> </table> | | | Subject passing criteria | Passing threshold | Percentage of the final grade | Lecture test | 50.0% | 20.0% | Practical exercise | 50.0% | 80.0% |
| Subject passing criteria | Passing threshold | Percentage of the final grade | | | | | | | | | | |
| Lecture test | 50.0% | 20.0% | | | | | | | | | | |
| Practical exercise | 50.0% | 80.0% | | | | | | | | | | |
| Recommended reading | <p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p> | <p>Kernighan W., Ritchie B.W.: The ANSI C Programming Language (2nd Edition), Prentice Hall; (April 1, 1988)</p> <p>Eckel B.: Thinking in C++: Introduction to Standard C++, Volume One (2nd Edition), Prentice Hall; (March 25, 2000)</p> <p>Olsson M., Modern C Quick Syntax Reference: A Pocket Guide to the Language, APIs, and Library, Second edition. Berkeley, CA: Apress L. P, 2018</p> <p>Horton I., Van Weert P., Beginning C++17 : From Novice to Professional / by Ivor Horton, Peter Van Weert. (5th ed. 2018).</p> <p>D. Harel, <i>Algorithmics: The Spirit of Computing</i>, Addison-Wesley, Reading, MA, 1987. 3rd edition, 2004 (with Y. Feldman).</p> | | | | | | | | | | |
| Example issues/ example questions/ tasks being completed | To design an iterative algorithm employing Horner scheme and write a program, in C / C + +, implementing this algorithm. | | | | | | | | | | | |
| Practical activities within the subject | Not applicable | | | | | | | | | | | |

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