



## Subject card

|                                             |                                                                                                                                                                                  |                                                          |                                                                                                                                                                                                                                         |                                     |                                                |            |     |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------|------------|-----|
| Subject name and code                       | Basics of Programming, PG_00047642                                                                                                                                               |                                                          |                                                                                                                                                                                                                                         |                                     |                                                |            |     |
| Field of study                              | Informatics                                                                                                                                                                      |                                                          |                                                                                                                                                                                                                                         |                                     |                                                |            |     |
| Date of commencement of studies             | October 2020                                                                                                                                                                     |                                                          | Academic year of realisation of subject                                                                                                                                                                                                 |                                     | 2020/2021                                      |            |     |
| 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                               | 1                                                                                                                                                                                |                                                          | Language of instruction                                                                                                                                                                                                                 |                                     | Polish                                         |            |     |
| Semester of study                           | 1                                                                                                                                                                                |                                                          | ECTS credits                                                                                                                                                                                                                            |                                     | 5.0                                            |            |     |
| 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                                                                                                                                                               |                                                          | prof. dr hab. inż. Dariusz Dereniowski                                                                                                                                                                                                  |                                     |                                                |            |     |
|                                             | Teachers                                                                                                                                                                         |                                                          | mgr inż. Tomasz Goluch<br><br>dr hab. inż. Robert Janczewski<br><br>dr Marcin Jurkiewicz<br><br>mgr inż. Robert Ostrowski<br><br>dr inż. Tytus Pikies<br><br>prof. dr hab. inż. Dariusz Dereniowski<br><br>mgr inż. Krzysztof Pastuszek |                                     |                                                |            |     |
| Lesson types and methods of instruction     | Lesson type                                                                                                                                                                      | Lecture                                                  | Tutorial                                                                                                                                                                                                                                | Laboratory                          | Project                                        | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                            | 30.0                                                     | 0.0                                                                                                                                                                                                                                     | 15.0                                | 20.0                                           | 0.0        | 65  |
|                                             | E-learning hours included: 0.0                                                                                                                                                   |                                                          |                                                                                                                                                                                                                                         |                                     |                                                |            |     |
|                                             | Adresy na platformie eNauczanie:                                                                                                                                                 |                                                          |                                                                                                                                                                                                                                         |                                     |                                                |            |     |
| 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                                                                                                                                                            | 65                                                       |                                                                                                                                                                                                                                         | 3.0                                 |                                                | 57.0       | 125 |
| Subject objectives                          | This course is an introduction to computer programming. Its primary objective is to teach solving of programming problems and writing programs using the C programming language. |                                                          |                                                                                                                                                                                                                                         |                                     |                                                |            |     |

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| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Subject outcome                                                                                                                                                                                                                                                                                                                                                     | Method of verification                |
|                                 | [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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Student knows and understands selected programming models and the evolution of related programming languages. Student learns one of the object oriented programming platforms.                                                                                                                                                                                      | [SW1] Assessment of factual knowledge |
|                                 | [K6_W05] Knows and understands, to an advanced extent, methods of supporting processes and functions, specific to the field of study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Student understands the cycle of code writing.                                                                                                                                                                                                                                                                                                                      | [SW1] Assessment of factual knowledge |
|                                 | [K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Student programs in a procedural programming language, runs and tests programs.                                                                                                                                                                                                                                                                                     | [SU1] Assessment of task fulfilment   |
| Subject contents                | <ol style="list-style-type: none"> <li>1. Introduction.</li> <li>2. Programming languages, alphabet, syntax and semantics. Translation.</li> <li>3. Classification of data types. Integer and floating point types.</li> <li>4. Arithmetic expressions and operators.</li> <li>5. Selected standard functions.</li> <li>6. Character type. Casting of types.</li> <li>7. Logical type. Logical operators and expressions.</li> <li>8. Input/output basics.</li> <li>9. Conditional statements (if, switch) and conditional expression.</li> <li>10. Iteration statements (for, while, do-while), nested iterations.</li> <li>11. Defining types. Constants. Enumerated type.</li> <li>12. One- and multi-dimensional arrays. Null-terminated strings.</li> <li>13. Basic rules for scope and lifetime of variables.</li> <li>14. Functions. Scope and lifetime of variables. Side effect.</li> <li>15. Passing parameters of a function.</li> <li>16. Pointer type and pointer arithmetics.</li> <li>17. Pointers for inter-function communication.</li> <li>18. Dynamic memory allocation.</li> <li>19. Basic dynamic data structures.</li> <li>20. Structures (records).</li> <li>21. Data structures using records and their applications.</li> <li>22. Basic dynamic data structures.</li> <li>23. Applications of dynamic data structures (stacks, queues, graph structures)</li> <li>24. Input/output streams classes. Input/output formatting.</li> <li>25. Processing files.</li> <li>26. Applications of recurrence ( e.g., divide and conquer, greediness, dynamic programming).</li> </ol> |                                                                                                                                                                                                                                                                                                                                                                     |                                       |
| Prerequisites and co-requisites | No requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                     |                                       |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Passing threshold                                                                                                                                                                                                                                                                                                                                                   | Percentage of the final grade         |
|                                 | Practical exercises - labs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 50.0%                                                                                                                                                                                                                                                                                                                                                               | 30.0%                                 |
|                                 | Written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 50.0%                                                                                                                                                                                                                                                                                                                                                               | 40.0%                                 |
|                                 | Project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 50.0%                                                                                                                                                                                                                                                                                                                                                               | 30.0%                                 |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>[1] Grębosz J., Symfonia C++ Standard (tom 1 i 2), Editions 2000, Krakow 2008.</p> <p>[2] Dereniowski D., Podstawy programowania - notatki do wykładu.</p> <p>[3] Materiały przygotowujące do laboratorium z Podstaw programowania (opracowanie zespołowe, 2013)</p> <p>For participants of the course, [2] and [3] are available at WWW page of the course.</p> |                                       |
|                                 | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | No requirements                                                                                                                                                                                                                                                                                                                                                     |                                       |

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|----------------------------------------------------------------|----------------------|--|
|                                                                | eResources addresses |  |
| Example issues/<br>example questions/<br>tasks being completed |                      |  |
| Work placement                                                 | Not applicable       |  |