

| STUDY MODULE DESCRIPTION FORM   |  |   |  |
|---|--|---|--|
| Name of the module/subject<br><b>Methods of programming</b>   |  |   | Code<br><b>1010341711010349410</b>                                 |
| Field of study<br><b>Mathematics in Technology</b>  | Profile of study<br>(general academic, practical)<br><b>general academic</b> |   | Year /Semester<br><b>1 / 1</b>                                     |
| Elective path/specialty<br><b>-</b>   | Subject offered in:<br><b>Polish</b>   | Course (compulsory, elective)<br><b>obligatory</b>  |  |
| Cycle of study:<br><b>First-cycle studies</b><br><b>(Polish Qualifications Framework level six)</b>   |  | Form of study (full-time, part-time)<br><b>full-time</b>  |  |
| No. of hours<br>Lecture: <b>30</b> Classes: <b>-</b> Laboratory: <b>30</b> Project/seminars: <b>-</b>   |  |   | No. of credits<br><b>4</b>   |
| Status of the course in the study program (Basic, major, other) (university-wide, from another field)<br><b>University-wide</b>   |  |   |  |
| Education areas and fields of science and art<br><b>Technical science</b><br><b>Technical science</b>   |  |   | ECTS distribution (number and %)<br><b>4 100%</b><br><b>4 100%</b> |
| <b>Responsible for subject / lecturer:</b><br>dr inż. Karol Gajda<br>email: karol.gajda@put.poznan.pl<br>tel.61 665 2805<br>Faculty of Electrical Engineering<br>ul. Piotrowo 3A 60-965 Poznań  |  |   |  |
| <b>Prerequisites in terms of knowledge, skills and social competencies:</b>   |  |   |  |
| 1   | <b>Knowledge</b>   | Basic knowledge with range of secondary school. (PQF 4)   |  |
| 2   | <b>Skills</b>  | Computer skills. The ability to effectively self-education in a field related to the chosen field of study. (PQF 4) |  |
| 3   | <b>Social competencies</b>   | Knowledge of the limits of their knowledge and understanding of the need for further education. (PQF 4)             |  |
| <b>Assumptions and objectives of the course:</b><br>Presentation of programming techniques and data structures used in small and medium scale programming.  |  |   |  |
| <b>Study outcomes and reference to the educational results for a field of study</b>   |  |   |  |
| <b>Knowledge:</b>   |  |   |  |
| 1. has expanded and in-depth knowledge of various branches of higher mathematics and detailed knowledge of the applications of mathematical methods and tools in technical sciences - [K_W01 (P6S_WG)]<br>2. has the ordered and theoretically founded knowledge of computer science, including numerical methods; knows at least one software package or programming language - [K_W06 (P6S_WG)]   |  |   |  |
| <b>Skills:</b>  |  |   |  |
| 1. can construct an algorithm for solving a simple engineering task and implement it and test it in a chosen programming environment - [K_U04 (P6S_UW)]<br>2. can operate equipment, tools, etc. in accordance with general requirements and technical documentation; knows how to apply the principles of health and safety at work - [K_U09 (P6S_UW)]<br>3. can independently plan and implement self-education in order to raise and update their competences - [K_U15 (P6S_UU)] |  |   |  |
| <b>Social competencies:</b>   |  |   |  |
| 1. is aware of the level of his knowledge in relation to the conducted research in exact and technical sciences - [K_K01 (P6S_KK)]<br>2. is aware of deepening and expanding knowledge to solve newly created technical problems - [K_K02 (P6S_KK)]   |  |   |  |

| Assessment methods of study outcomes   |                      |
|--|----------------------|
| <ul style="list-style-type: none"> <li>- evaluation of knowledge acquired in the lecture</li> <li>- skills assessment related to the implementation of project tasks</li> <li>- evaluation of student preparation for classes and laboratory evaluation of skills related to the implementation of laboratory exercises</li> <li>- evaluation of reports</li> <li>- evaluation of team skills</li> </ul>   |                      |
| Course description   |                      |
| <p>Date of revision: 31/10/2018</p> <p>The basic elements of Java language:</p> <ul style="list-style-type: none"> <li>- data types,</li> <li>- variables,</li> <li>- operators,</li> <li>- strings,</li> <li>- input and output,</li> <li>- controlling the program execution,</li> <li>- big numbers,</li> <li>- tables.</li> </ul> <p>Objects and classes.</p> <p>Inheritance.</p> <p>Applied education methods</p> <p>1) lectures:</p> <ul style="list-style-type: none"> <li>- lecture with multimedia presentation supplemented with examples given on the board,</li> <li>- a lecture conducted in an interactive manner with formulating questions to a group of students or to specific students indicated,</li> <li>- students' activity during classes is taken into account when issuing the final mark,</li> <li>- during the lecture initiating the discussion,</li> <li>- theory presented in close connection with practice,</li> <li>- theory presented in connection with the current knowledge of students,</li> <li>- presenting a new topic preceded by a reminder of related content known to students in other subjects.</li> </ul> <p>2) laboratory:</p> <ul style="list-style-type: none"> <li>- laboratories supplemented with multimedia presentations (including: drawings, photos, animations, sound, films),</li> <li>- detailed reviewing of reports by the laboratory chair and discussions on comments,</li> <li>- using tools that enable students to perform tasks at home (eg open source software),</li> <li>- demonstrations,</li> <li>- work in teams,</li> <li>- computational experiments.</li> </ul> |                      |
| <p><b>Basic bibliography:</b></p> <p>1. G. Cornell, C. Horstmann, Core Java.</p>   |                      |
| <p><b>Additional bibliography:</b></p> <p>1. R. Sedgewick, K. Wayne, Introduction to Programming in Java: An Interdisciplinary Approach (2nd Edition)</p> <p>2. B. Eckel, Thinking in Java.</p>  |                      |
| Result of average student's workload   |                      |
| Activity   | Time (working hours) |

|  |                   |
|--|-------------------|
| 1. participation in lectures (15x2 hrs.)   | 30                |
| 2. participation in laboratory classes (15x2 hrs.)   | 30                |
| 3. participation in the consultations related to the implementation of the education process, in particular laboratory / project | 10                |
| 4. completion (within own work) reports on laboratory exercises  | 5                 |
| 5. write a program / programs, commissioning and verification (time outside of the classroom laboratory)                         | 15                |
| 6. preparation for laboratory exercises  | 15                |
| 7. preparation for tests / test  | 5                 |
| 8. read with the specified literature / teaching materials   | 5                 |
| <b>Student's workload</b>  |                   |
| <b>Source of workload</b>  | <b>hours ECTS</b> |
| Total workload   | 115 4             |
| Contact hours  | 70 2              |
| Practical activities   | 75 3              |