### COURSE DESCRIPTION

**1. Course title:** FUNDAMENTALS OF COMPUTER PROGRAMMING  
**2. Course code:** FoCP

**3. Validity of course description:** 2017/2018

**4. Level of studies:** 1st cycle of higher education

**5. Mode of studies:** intramural studies

**6. Field of study:** Macrofaculty RAU

**7. Profile of studies:**

**8. Programme:**

**9. Semester:** I

**10. Faculty teaching the course:** Faculty of Automatic Control, Electronics and Computer Science

**11. Course instructor:** dr inż. Piotr Fabian

**12. Course classification:** common courses

**13. Course status:** compulsory

**14. Language of instruction:** English

**15. Pre-requisite qualifications:** general skills in logical thinking and mathematics

**16. Course objectives:** The course provides the knowledge required to understand, design and write computer programs in the C language. The aim of the course is to lay a solid foundation of good software engineering and programming language practice. The program contains: introduction to imperative programming in C language (basic knowledge required to create and understand programs as well as skills essential for good software engineering and programming practice), basic algorithms and data structures and some advanced problems and techniques essential for programmers. Lectures are illustrated with slides with many sample programs. They are supported by laboratories, which give students an opportunity to create programs on their own.

**17. Description of learning outcomes:**

<table>
<thead>
<tr>
<th>Nr</th>
<th>Learning outcomes description</th>
<th>Method of assessment</th>
<th>Teaching methods</th>
<th>Learning outcomes reference code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Is able to apply mathematical knowledge to formulate, analyze and solve simple problems related to computer science</td>
<td>Written test</td>
<td>Lecture</td>
<td>K1A_W3, K1A_W12</td>
</tr>
<tr>
<td>2</td>
<td>Can write, run and test programs in selected development environment</td>
<td>Practical exercises</td>
<td>Laboratory</td>
<td>K1A_U10</td>
</tr>
<tr>
<td>3</td>
<td>Designs and analyzes simple algorithms using basic programming techniques and data structures</td>
<td>Computer program</td>
<td>Laboratory</td>
<td>K1A_U10</td>
</tr>
<tr>
<td>4</td>
<td>Applies different types of data representation according to the situation (numbers, arrays, text)</td>
<td>Computer program</td>
<td>Laboratory</td>
<td>K1A_U10</td>
</tr>
<tr>
<td>5</td>
<td>Constructs software based on project technical documentation, prepares documentation</td>
<td>Computer program</td>
<td>Laboratory</td>
<td>K1A_U3</td>
</tr>
</tbody>
</table>

**18. Teaching modes and hours**

Lecture / BA/MA Seminar / Class / Project / Laboratory
Sem. 1 - Lecture 30 hours, Laboratory 30 hours

**19. Syllabus description:**

Lecture:
1. Introduction.
2. The first program.
3. Development environments
4. Variables, basic types.
5. Operators and expressions.
6. Instructions and program control.
7. The structure of a program.
8. Functions.
9. Memory management.
10. Arrays and pointers, memory allocation.
12. The preprocessor, separate compilation.
13. Header files and libraries.

Laboratory:

Small programming exercises; one individual programming assignment.

20. Examination: —

21. Primary sources:
2. Also available in Polish: B. W. Kernighan, D.M. Ritchie, Język ANSI C, WNT.
3. B. Stroustrup, The C++ Programming Language. Addison-Wesley, Reading, MA. Also available in Polish: Język C++, WNT.

22. Secondary sources:
2. The C++ Resources Network (http://www.cplusplus.com/)

23. Total workload required to achieve learning outcomes

<table>
<thead>
<tr>
<th>Lp.</th>
<th>Teaching mode</th>
<th>Contact hours / Student workload hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lecture</td>
<td>30 / 15</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>- / -</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>30 / 15</td>
</tr>
<tr>
<td>4</td>
<td>Project</td>
<td>/</td>
</tr>
<tr>
<td>5</td>
<td>BA/ MA Seminar</td>
<td>/</td>
</tr>
<tr>
<td>6</td>
<td>Other</td>
<td>- / -</td>
</tr>
</tbody>
</table>

Total number of hours: 60 / 30

24. Total hours: 90

25. Number of ECTS credits: 3

26. Number of ECTS credits allocated for contact hours: 1

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2

28. Comments: —

Approved:

..................................................  ..................................................
(date, Instructor’s signature)                (date, the Director of the Faculty Unit signature)