1. Course title: SOFT COMPUTING, Scientific computing
2. Course code SC_SC


4. Level of studies: MSc programme

5. Mode of studies: intramural studies

6. Field of study:
   CONTROL, ELECTRONIC AND INFORMATION ENGINEERING (MACRO)
   (FACULTY SYMBOL) RAU-2

7. Profile of studies: ACADEMIC

8. Programme: DATA SCIENCE

9. Semester: 1

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

11. Course instructor: Prof. dr hab. inż. Sebastian Deorowicz

12. Course classification: common courses

13. Course status: compulsory / elective

14. Language of instruction: English

15. Pre-requisite qualifications: Computer programming, Algorithms and Data Structures

16. Course objectives: The aim of the course is making students familiar with computing techniques for science and engineering. The course is focused on the use of supercomputing centers and computing clusters.

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>Student knows supercomputer architecture.</td>
<td>Exam</td>
<td>Lecture</td>
<td>K2A_W15</td>
</tr>
<tr>
<td>2.</td>
<td>Student knows programming techniques for high efficiency computations.</td>
<td>Exam</td>
<td>Lecture</td>
<td>K2A_W16</td>
</tr>
<tr>
<td>3.</td>
<td>Student is able to design simple applications for high efficiency computing.</td>
<td>Project tasks</td>
<td>Project</td>
<td>K2A_U01</td>
</tr>
<tr>
<td>4.</td>
<td>Student is able to construct simple implementation in the area of high efficiency computing.</td>
<td>Project tasks</td>
<td>Project</td>
<td>K2A_U02</td>
</tr>
<tr>
<td>5.</td>
<td>Student is able to verify in practice quality of applications of high efficiency computing.</td>
<td>Project tasks</td>
<td>Project</td>
<td>K2A_U03</td>
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<td>6.</td>
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<td>9.</td>
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</tbody>
</table>

18. Teaching modes and hours

Lecture 15 / BA/MA Seminar / Class / Project 15 / Laboratory
19. Syllabus description:

Lecture:
1. Large-scale computations.
2. Clusters and grids.
4. Storage systems in supercomputing centres.
5. Programming for supercomputers.
6. Case studies.

Project:
1. Project and sample implementation solving some scientific or engineering problems at supercomputer platform.

20. Examination: semester 1

21. Primary sources:

22. Secondary sources:

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>15/30</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>/</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>/</td>
</tr>
<tr>
<td>4</td>
<td>Project</td>
<td>15/30</td>
</tr>
<tr>
<td>5</td>
<td>BA/ MA Seminar</td>
<td>/</td>
</tr>
<tr>
<td>6</td>
<td>Other</td>
<td>/</td>
</tr>
<tr>
<td></td>
<td>Total number of hours</td>
<td>30/60</td>
</tr>
</tbody>
</table>

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

26. Comments:

Approved:

……………………………
(date, Instructor’s signature)

…………………………………………………
(date, the Director of the Faculty Unit signature)