| Z1-PU7 | WYDANIE N1 |
|---|---|

(*faculty stamp*)

**COURSE DESCRIPTION**

| | |
|---|---|
| **1. Course title: SOFT COMPUTING, Scientific computing** | **2. Course code SC_SC** |
| **3. Validity of course description:** 2018/2019 | |
| **4. Level of studies:** MSc programme | |
| **5. Mode of studies:** intramural studies | |
| **6. Field of study**:<br>CONTROL, ELECTRONIC AND INFORMATION ENGINEERING (MACRO) | (FACULTY SYMBOL)<br>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:**

| Nr | Learning outcomes description | Method of assessment | Teaching methods | Learning outcomes reference code |
|---|---|---|---|---|
| 1. | Student knows supercomputer architecture. | Exam | Lecture | K2A_W15 |
| 2. | Student knows programming techniques for high efficiency computations. | Exam | Lecture | K2A_W16 |
| 3. | Student is able to design simple applications for high efficiency computing. | Project tasks | Project | K2A_U01 |
| 4. | Student is able to construct simple implementation in the area of high efficiency computing. | Project tasks | Project | K2A_U02 |
| 5. | Student is able to verify in practice quality of applications of high efficiency computing. | Project tasks | Project | K2A_U03 |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |

**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.
3. Supercomputers.
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:**

P. Czarnul, Parallel Programming for Modern High Performance Computing Systems, 2018.
G. Hager, G. Wellein, Introduction to High Performance Computing for Scientists and Engineers, 2010.

**22. Secondary sources:**

J. Jeffers, J. Reinders, Intel Xeon Phi Processor High Performance Programming: Knights Landing Edition, 2016.

**23. Total workload required to achieve learning outcomes**

| Lp. | Teaching mode : | Contact hours / Student workload hours |
|---|---|---|
| 1 | Lecture | 15/30 |
| 2 | Classes | / |
| 3 | Laboratory | / |
| 4 | Project | 15/30 |
| 5 | BA/ MA Seminar | / |
| 6 | Other | / |
| | Total number of hours | 30/60 |

**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)*