



**AGH**

AGH UNIVERSITY OF SCIENCE  
AND TECHNOLOGY

Faculty of: Physics and Applied Computer Science

Field of study: Applied Computer Science

Study level: First-cycle studies

Form and type of study: Full-time studies

Annual: 2018/2019

Lecture language: Polish

| Code               | Module name                        | Lectures | Auditorium classes | Laboratory classes | Project classes | Conversation seminar | Seminar classes | Practical classes | Fieldwork classes | Workshops | Others | E-learning | ECTS | E   |
|--------------------|------------------------------------|----------|--------------------|--------------------|-----------------|----------------------|-----------------|-------------------|-------------------|-----------|--------|------------|------|-----|
| <b>Semester 1</b>  |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Mathematics        |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-101-s        | Mathematics 1                      | 45       | 60                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 8    | Yes |
| IIS-1-102-s        | Linear Algebra                     | 30       | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | Yes |
| IIS-1-109-s        | Discrete Mathematics               | 30       | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| Other Basic        |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-105-s        | Fundamentals of Computer Science   | 30       | 15                 | 15                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| IIS-1-107-s        | Basics of Operating Systems / UNIX | 10       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| Physical Education |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-106-s        | Physical Education 1               | 0        | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 30     | 0          | 0    | No  |
| Physics            |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-103-s        | Physics Revision                   | 0        | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| Suma ECTS          |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 27   |     |
| <b>Semester 2</b>  |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Mathematics        |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-201-s        | Mathematics 2                      | 30       | 45                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 7    | Yes |
| IIS-1-202-s        | Statistics and Data Processing     | 30       | 15                 | 15                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| Other Basic        |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-203-s        | Algorithms and Data Processing     | 30       | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | Yes |
| IIS-1-205-s        | Procedural Programming             | 30       | 0                  | 45                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |

## Study programme - Applied Computer Science - 2018/2019

| Code   | Module name   | Lectures | Auditorium classes | Laboratory classes | Project classes | Conversation seminar | Seminar classes | Practical classes | Fieldwork classes | Workshops | Others | E-learning | ECTS | E   |
|--|---|----------|--------------------|--------------------|-----------------|----------------------|-----------------|-------------------|-------------------|-----------|--------|------------|------|-----|
| <b>Physical Education</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-204-s  | Physical Education 2  | 0        | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 15     | 0          | 0    | No  |
| <b>Physics</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-206-s  | Mechanics and Thermodynamics  | 30       | 24                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| <b>Foreign language</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| The rules for selecting groups/modules: Jeden przedmiot z grupy  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-208-s  | English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3 | 0        | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| JIS-1-210-s  | French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3  | 0        | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| JIS-1-211-s  | German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3  | 0        | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| JIS-1-212-s  | Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3 | 0        | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| JIS-1-213-s  | Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 1/3 | 0        | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| <b>Humanities Electives I (Faculty of Humanities)</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| The rules for selecting groups/modules: Student wybiera dowolną liczbę godzin modułów obieralnych o sumarycznym wymiarze ECTS nie mniejszym niż 2. |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-207-s  | Socjologia podróży i turystyki  | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| JIS-1-209-s  | The Middle East - culture and society   | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| JIS-1-214-s  | Warsztaty z komunikacji interpersonalnej  | 6        | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 12        | 0      | 0          | 2    | No  |
| JIS-1-217-s  | Globalization. New challenges in the contemporary world   | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| JIS-1-218-s  | The Main Issues and Directions of Philosophy  | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| JIS-1-219-s  | Konflikty współczesnego świata  | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| JIS-1-220-s  | Basis for negotiations  | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| JIS-1-222-s  | Socjologia. Wybrane zagadnienia   | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| JIS-1-223-s  | Podstawy psychologii  | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| JIS-1-226-s  | Religions of the world  | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| <b>Humanities Electives I (Faculty of Management)</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| The rules for selecting groups/modules: Student wybiera dowolną liczbę godzin modułów obieralnych o sumarycznym wymiarze ECTS nie mniejszym niż 3. |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-216-s  | Business Plan   | 15       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 30        | 0      | 0          | 3    | No  |
| JIS-1-221-s  | Cost Analysis for Engineers   | 15       | 15                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| JIS-1-224-s  | Zarządzanie przedsiębiorstwem   | 30       | 15                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| JIS-1-225-s  | Managerial Economics  | 30       | 15                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| Suma ECTS  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 33   |     |
| <b>Semester 3</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| <b>Engineering</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-309-s  | Circuits and Signals Theory   | 15       | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| <b>Mathematics</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-301-s  | Mathematics 3   | 30       | 30                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| <b>Other Basic</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |

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|---|---|----------|--------------------|--------------------|-----------------|----------------------|-----------------|-------------------|-------------------|-----------|--------|------------|------|-----|
| IIS-1-305-s   | Fundamental Concepts of Object-Oriented Programming   | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | No  |
| IIS-1-306-s   | Computer Networks   | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| <b>Physical Education</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-308-s   | Physical Education 3  | 0        | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 15     | 0          | 0    | No  |
| <b>Physics</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-304-s   | Electromagnetism and Optics   | 30       | 24                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| <b>Foreign language</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| The rules for selecting groups/modules: Jeden przedmiot z grupy   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-310-s   | French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3  | 0        | 45                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| IIS-1-311-s   | English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3 | 0        | 45                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| IIS-1-312-s   | German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3  | 0        | 45                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| IIS-1-313-s   | Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3 | 0        | 45                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| IIS-1-314-s   | Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 2/3 | 0        | 45                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 0    | No  |
| <b>Electives IS I.3</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 4    |     |
| The rules for selecting groups/modules: Student musi zrealizować moduły obieralne za łączną wartość co najmniej 4 punktów ECTS. |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Suma ECTS   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 27   |     |
| <b>Semester 4</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| <b>Engineering</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-403-s   | Electronic Systems  | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| IIS-1-405-s   | Numerical methods   | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | Yes |
| IIS-1-407-s   | Fundamentals of Computer Graphics   | 30       | 0                  | 15                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| <b>Other Basic</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-402-s   | Object-oriented Programming 1   | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| <b>Physics</b>  |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-401-s   | Physics Laboratory  | 0        | 0                  | 15                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| <b>Foreign language</b>   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 5    |     |
| The rules for selecting groups/modules: Jeden przedmiot z bloku   |   |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-404-s   | French B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3  | 0        | 60                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| IIS-1-406-s   | Spanish B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3 | 0        | 60                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| IIS-1-409-s   | German B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3  | 0        | 60                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| IIS-1-410-s   | English B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3 | 0        | 60                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| IIS-1-411-s   | Russian B2 course - compulsory course of 135 hours for students of FIRST-CYCLE studies - semester 3/3 | 0        | 60                 | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |

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|---|------------------------------------|----------|--------------------|--------------------|-----------------|----------------------|-----------------|-------------------|-------------------|-----------|--------|------------|------|-----|
| <b>Electives IS I.4</b>   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 4    |     |
| The rules for selecting groups/modules: Student musi zrealizować moduły obieralne za łączną wartość co najmniej 4 punktów ECTS.   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Suma ECTS   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 33   |     |
| <b>Semester 5</b>   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Engineering   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-503-s   | Databases 1                        | 30       | 0                  | 26                 | 4               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | No  |
| JIS-1-505-s   | Numerical Methods for Engineers    | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| Other Basic   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-501-s   | Object-oriented Programming 2      | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| <b>Electives IS I.5</b>   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 14   |     |
| The rules for selecting groups/modules: Student musi zrealizować moduły obieralne za łączną wartość co najmniej 14 punktów ECTS, w tym przedmiot w całości prowadzony w języku obcym, za który może uzyskać co najmniej 3 ECTS. Student musi zrealizować pierwsze moduły z dwóch wybranych przez siebie bloków. |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Suma ECTS   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 29   |     |
| <b>Semester 6</b>   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Engineering   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-601-s   | Software Engineering               | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| JIS-1-604-s   | Practical placement                | 0        | 0                  | 0                  | 0               | 0                    | 0               | 160               | 0                 | 0         | 0      | 0          | 5    | No  |
| JIS-1-605-s   | Computational Intelligence Methods | 45       | 0                  | 30                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| Mathematics   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-603-s   | Graphs and Their Uses              | 30       | 0                  | 15                 | 0               | 0                    | 15              | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| <b>Electives IS I.6</b>   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 12   |     |
| The rules for selecting groups/modules: Student musi zrealizować moduły obieralne za łączną wartość co najmniej 12 punktów ECTS. Student musi zrealizować drugie moduły z dwóch wybranych przez siebie bloków.  |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Suma ECTS   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 31   |     |
| <b>Semester 7</b>   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Engineering   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-702-s   | Computer-controlled Measurements   | 15       | 0                  | 15                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| Thesis  |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-701-s   | B.Sc. thesis                       | 0        | 0                  | 0                  | 45              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 15   | Yes |
| <b>Electives IS I.7</b>   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 12   |     |
| The rules for selecting groups/modules: Student musi zrealizować moduły obieralne za łączną wartość co najmniej 12 punktów ECTS. Student musi zrealizować trzecie moduły z dwóch wybranych przez siebie bloków.   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Suma ECTS   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 30   |     |
| <b>Semester 0 - Completion of modules in any semester</b>   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| Engineering   |                                    |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| JIS-1-002-s   | Computer Architecture              | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| JIS-1-004-s   | Network Security                   | 30       | 0                  | 15                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| JIS-1-005-s   | Reverse Engineering                | 0        | 0                  | 20                 | 20              | 0                    | 20              | 0                 | 0                 | 0         | 0      | 0          | 5    | No  |
| JIS-1-006-s   | Programming in Python              | 0        | 0                  | 45                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| JIS-1-007-s   | Functional programming in Scala    | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |

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|--|--|----------|--------------------|--------------------|-----------------|----------------------|-----------------|-------------------|-------------------|-----------|--------|------------|------|-----|
| IIS-1-008-s  | Sound and Music in Computer Systems                                  | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| IIS-1-010-s  | Multicore programming  | 15       | 0                  | 18                 | 10              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| IIS-1-011-s  | Python in the Enterprise   | 15       | 0                  | 20                 | 10              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| IIS-1-014-s  | Practical design patterns in programming                             | 0        | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| IIS-1-020-s  | Design of CMOS Integrated Circuits                                   | 15       | 0                  | 30                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| IIS-1-022-s  | Video and Animation in Computer Systems                              | 0        | 0                  | 15                 | 15              | 0                    | 15              | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| IIS-1-023-s  | Functional programming with Scala                                    | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| IIS-1-024-s  | Applications for Mobile Devices                                      | 15       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| IIS-1-025-s  | Fundamentals of Data Science   | 15       | 0                  | 15                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | Yes |
| IIS-1-027-s  | Deep Learning with CUDA  | 12       | 0                  | 20                 | 5               | 0                    | 8               | 0                 | 0                 | 0         | 0      | 0          | 6    | Yes |
| IIS-1-028-s  | Scientific Text Edition and Presentation                             | 15       | 0                  | 15                 | 0               | 0                    | 15              | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| IIS-1-030-s  | Programming in C#  | 20       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| IIS-1-031-s  | VPython: 3D Simulations of Physical Processes for Everybody          | 15       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| IIS-1-034-s  | Design of integrated circuits in CMOS technology                     | 15       | 0                  | 30                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | Yes |
| IIS-1-035-s  | R software   | 0        | 0                  | 30                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| IIS-1-038-s  | Advanced topics of multi- and many-core software design              | 15       | 0                  | 22                 | 8               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 5    | No  |
| IIS-1-039-s  | Introduction to MS Windows PowerShell and Microsoft Active Directory | 15       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 4    | No  |
| IIS-1-040-s  | SOLID programming basics   | 0        | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| IIS-1-041-s  | Fundamentals of Control Engineering                                  | 30       | 0                  | 15                 | 6               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | No  |
| <b>Mathematics</b>   |  |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-026-s  | Introduction to Game Theory  | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 3    | Yes |
| IIS-1-032-s  | Nonlinear Dynamics   | 30       | 0                  | 0                  | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 2    | Yes |
| IIS-1-036-s  | Econophysics   | 20       | 0                  | 0                  | 0               | 0                    | 10              | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| <b>Other Basic</b>   |  |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-033-s  | Interdisciplinary Seminar on Complex Systems                         | 0        | 0                  | 0                  | 0               | 0                    | 15              | 0                 | 0                 | 0         | 0      | 0          | 2    | No  |
| <b>Databases</b>   |  |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| The rules for selecting groups/modules: Student w czasie toku studiów I stopnia ma obowiązek wybrać i zrealizować w całości dwa z bloków:                                    |  |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 18   |     |
| <ul style="list-style-type: none"> <li>• Bazy danych</li> <li>• Metody numeryczne</li> <li>• Grafika i multimedia</li> <li>• Systemy wbudowane i rekonfigurowalne</li> </ul> |  |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-003-s  | Internet Techniques  | 30       | 0                  | 26                 | 4               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| IIS-1-012-s  | Databases 2  | 30       | 0                  | 26                 | 4               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | Yes |
| IIS-1-029-s  | Processing Data in Cloud Computing                                   | 30       | 0                  | 15                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| <b>Embedded and Reconfigurable Systems</b>   |  |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| The rules for selecting groups/modules: Student w czasie toku studiów I stopnia ma obowiązek wybrać i zrealizować w całości dwa z bloków:                                    |  |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 18   |     |
| <ul style="list-style-type: none"> <li>• Bazy danych</li> <li>• Metody numeryczne</li> <li>• Grafika i multimedia</li> <li>• Systemy wbudowane i rekonfigurowalne</li> </ul> |  |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| IIS-1-013-s  | Embeded Systems  | 18       | 0                  | 24                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |

## Study programme - Applied Computer Science - 2018/2019

| Code   | Module name                         | Lectures | Auditorium classes | Laboratory classes | Project classes | Conversation seminar | Seminar classes | Practical classes | Fieldwork classes | Workshops | Others | E-learning | ECTS | E   |
|--|-------------------------------------|----------|--------------------|--------------------|-----------------|----------------------|-----------------|-------------------|-------------------|-----------|--------|------------|------|-----|
| IIS-1-015-s  | Hardware Description Language       | 20       | 0                  | 22                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| IIS-1-050-s  | Low-level Programming               | 0        | 0                  | 18                 | 18              | 0                    | 21              | 0                 | 0                 | 0         | 0      | 0          | 6    | Yes |
| <b>Graphics and Multimedia</b>   |                                     |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| The rules for selecting groups/modules: Student w czasie toku studiów I stopnia ma obowiązek wybrać i zrealizować w całości dwa z bloków:                                    |                                     |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| <ul style="list-style-type: none"> <li>• Bazy danych</li> <li>• Metody numeryczne</li> <li>• Grafika i multimedia</li> <li>• Systemy wbudowane i rekonfigurowalne</li> </ul> |                                     |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 18   |     |
| IIS-1-009-s  | Image Analysis                      | 30       | 0                  | 15                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| IIS-1-019-s  | Visualization and Computer Graphics | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | Yes |
| IIS-1-021-s  | 3D Graphics                         | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| <b>Numerical Methods</b>   |                                     |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| The rules for selecting groups/modules: Student w czasie toku studiów I stopnia ma obowiązek wybrać i zrealizować w całości dwa z bloków:                                    |                                     |          |                    |                    |                 |                      |                 |                   |                   |           |        |            |      |     |
| <ul style="list-style-type: none"> <li>• Bazy danych</li> <li>• Metody numeryczne</li> <li>• Grafika i multimedia</li> <li>• Systemy wbudowane i rekonfigurowalne</li> </ul> |                                     |          |                    |                    |                 |                      |                 |                   |                   |           |        |            | 18   |     |
| IIS-1-016-s  | Computational Software              | 15       | 0                  | 30                 | 15              | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| IIS-1-017-s  | Fundamentals of FEM                 | 15       | 0                  | 45                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | No  |
| IIS-1-018-s  | Numerical Methods for Engineers 2   | 30       | 0                  | 30                 | 0               | 0                    | 0               | 0                 | 0                 | 0         | 0      | 0          | 6    | Yes |