

|    |  |  |
|----|--|--|
| 1. | Field of study   | Physics  |
| 2. | Academic year of entry                                       | 2017/2018 (winter term), 2018/2019 (winter term) |
| 3. | Academic year for which the revised course structure applies | 2017/2018  |
| 4. | Level of qualifications/degree                               | second-cycle studies                             |
| 5. | Degree profile   | general academic                                 |
| 6. | Mode of study  | full-time  |
| 7. | ISCED code   | 0533 (Physics)                                   |

## Specialization: Experimental Physics

A

| No.             | Module   | E/C | form of teaching |            |            | Total ECTS | year 1     |           |           |            |            |           | year 2     |            |           |            |           |           |    |    |
|-----------------|--|-----|------------------|------------|------------|------------|------------|-----------|-----------|------------|------------|-----------|------------|------------|-----------|------------|-----------|-----------|----|----|
|                 |  |     | Total            | L          | O          |            | semester 1 |           |           | semester 2 |            |           | semester 3 |            |           | semester 4 |           |           |    |    |
|                 |  |     |                  |            |            |            | L          | O         | E         | L          | O          | E         | L          | O          | E         | L          | O         | E         |    |    |
| 1               | Laboratory of Physics  | Z   | 60               |            | 60         | 10         |            | 60        | 10        |            |            |           |            |            |           |            |           |           |    |    |
| 2               | Selected Topics of Solid State Physics                         | E   | 30               | 30         |            | 3          | 30         |           | 3         |            |            |           |            |            |           |            |           |           |    |    |
| 3               | Seminarium magisterskie cz.1                                   | Z   | 15               |            | 15         | 3          |            | 15        | 3         |            |            |           |            |            |           |            |           |           |    |    |
| 4               | Wybrane zagadnienia z fizyki kwantowej                         | E   | 30               | 30         |            | 3          | 30         |           | 3         |            |            |           |            |            |           |            |           |           |    |    |
| 5               | Wybrane zagadnienia z fizyki teoretycznej                      | E   | 30               | 30         |            | 3          | 30         |           | 3         |            |            |           |            |            |           |            |           |           |    |    |
| 6               | Wykład specjalistyczny I                                       | E   | 60               | 60         |            | 6          | 30         |           | 3         |            |            |           | 30         |            | 3         |            |           |           |    |    |
| 7               | Wykład specjalistyczny III                                     | E   | 60               | 60         |            | 6          | 30         |           | 3         |            |            |           | 30         |            | 3         |            |           |           |    |    |
| 8               | Laboratorium fizyczne-specjalistyczne cz. 1                    | Z   | 60               |            | 60         | 6          |            |           |           |            | 60         | 6         |            |            |           |            |           |           |    |    |
| 9               | Pracownia magisterska cz.1; przygotowanie pracy magisterskiej  | Z   | 30               |            | 30         | 10         |            |           |           |            | 30         | 10        |            |            |           |            |           |           |    |    |
| 10              | Seminarium magisterskie cz. 2                                  | Z   | 15               |            | 15         | 3          |            |           |           |            | 15         | 3         |            |            |           |            |           |           |    |    |
| 11              | Wstęp do teorii ciała stałego                                  | E   | 60               | 30         | 30         | 7          |            |           |           |            | 30         | 30        | 7          |            |           |            |           |           |    |    |
| 12              | Wykład specjalistyczny IA                                      | E   | 30               | 30         |            | 4          |            |           |           |            | 30         |           | 4          |            |           |            |           |           |    |    |
| 13              | Laboratorium fizyczne – specjalistyczne cz. 2                  | Z   | 60               |            | 60         | 4          |            |           |           |            |            |           |            |            | 60        | 4          |           |           |    |    |
| 14              | Pracownia magisterska cz. 2; przygotowanie pracy magisterskiej | Z   | 30               |            | 30         | 10         |            |           |           |            |            |           |            | 30         | 10        |            |           |           |    |    |
| 15              | Seminarium magisterskie cz. 3                                  | Z   | 15               |            | 15         | 2          |            |           |           |            |            |           |            |            | 15        | 2          |           |           |    |    |
| 16              | Wykład specjalistyczny II                                      | E   | 30               | 30         |            | 3          |            |           |           |            |            |           | 30         |            | 3         |            |           |           |    |    |
| 17              | Pracownia magisterska cz. 3; przygotowanie pracy magisterskiej | Z   | 60               |            | 60         | 27         |            |           |           |            |            |           |            |            |           |            |           |           | 60 | 27 |
| 18              | Seminarium magisterskie cz. 4                                  | Z   | 15               |            | 15         | 3          |            |           |           |            |            |           |            |            |           |            |           |           | 15 | 3  |
| <b>TOTAL A:</b> |  |     | <b>690</b>       | <b>300</b> | <b>390</b> | <b>113</b> | <b>150</b> | <b>75</b> | <b>28</b> | <b>60</b>  | <b>135</b> | <b>30</b> | <b>90</b>  | <b>105</b> | <b>25</b> | <b>0</b>   | <b>75</b> | <b>30</b> |    |    |

## Other requirements

| No. | Module                                   | E/C | form of teaching |    |    | Total ECTS | year 1     |    |   |            |   |   | year 2     |   |   |            |   |   |  |  |  |
|-----|--|-----|------------------|----|----|------------|------------|----|---|------------|---|---|------------|---|---|------------|---|---|--|--|--|
|     |  |     | Total            | L  | O  |            | semester 1 |    |   | semester 2 |   |   | semester 3 |   |   | semester 4 |   |   |  |  |  |
|     |  |     |                  |    |    |            | L          | O  | E | L          | O | E | L          | O | E | L          | O | E |  |  |  |
| 1   | Advanced English Language Course         | E   | 30               |    | 30 | 2          |            | 30 | 2 |            |   |   |            |   |   |            |   |   |  |  |  |
| 2   | Przedmiot z obszaru nauk humanistycznych | Z   | 30               | 30 |    | 3          |            |    |   |            |   |   | 30         |   | 3 |            |   |   |  |  |  |
| 3   | Przedmiot z obszaru nauk społecznych     | Z   | 30               | 30 |    | 2          |            |    |   |            |   |   | 30         |   | 2 |            |   |   |  |  |  |

**Other requirements**

| No.                              | Module | E/C | form of teaching |     |     |            | year 1     |    |     |            |     |    | year 2     |    |   |            |   |   |
|----------------------------------|--------|-----|------------------|-----|-----|------------|------------|----|-----|------------|-----|----|------------|----|---|------------|---|---|
|                                  |        |     | Total            | L   | O   | Total ECTS | semester 1 |    |     | semester 2 |     |    | semester 3 |    |   | semester 4 |   |   |
|                                  |        |     |                  |     |     |            | L          | O  | E   | L          | O   | E  | L          | O  | E | L          | O | E |
| <b>TOTAL Other requirements:</b> |        |     | 90               | 60  | 30  | 7          | 0          | 30 | 2   | 0          | 0   | 0  | 60         | 0  | 5 | 0          | 0 | 0 |
| <b>TOTAL:</b>                    |        |     | 780              | 360 | 420 | 120        | 255        | 30 | 195 | 30         | 255 | 30 | 75         | 30 |   |            |   |   |
| <b>TOTAL</b>                     |        |     | <b>780</b>       |     |     |            |            |    |     |            |     |    |            |    |   |            |   |   |

The study ends with the awarding of a Master's Degree in the field of Physics: Experimental Physics.

**Legend**

Each semester consists of 15 weeks

E/C - examination/course work

E - ECTS

L - lecture, O - all forms of teaching excluding lecture (practical classes, laboratory classes, discussion classes, seminar, proseminar, language classes, field practice, workshop, internship, tutoring)

Plan studiów zatwierdzony przez Radę Wydziału w dniu 20.06.2017 r.

Otrzymują:

1. Dział Kształcenia
2. Wydział Matematyki, Fizyki i Chemii
3. Dziekanat

.....  
(pieczęć i podpis Dyrektora Instytutu)

.....  
(pieczęć i podpis Dziekana)

|    |  |  |
|----|--|--|
| 1. | Field of study   | Physics  |
| 2. | Academic year of entry                                       | 2017/2018 (winter term), 2018/2019 (winter term) |
| 3. | Academic year for which the revised course structure applies | 2017/2018  |
| 4. | Level of qualifications/degree                               | second-cycle studies                             |
| 5. | Degree profile   | general academic                                 |
| 6. | Mode of study  | full-time  |
| 7. | ISCED code   | 0533 (Physics)                                   |

### Specialization: Nanophysics and Mesoscopic Materials - Modelling and Applications

A

| No. | Module                                 | E/C | form of teaching |    |     | Total ECTS | year 1     |    |   |            |     |   | year 2     |     |   |            |   |   |  |  |
|-----|--|-----|------------------|----|-----|------------|------------|----|---|------------|-----|---|------------|-----|---|------------|---|---|--|--|
|     |  |     | Total            | L  | O   |            | semester 1 |    |   | semester 2 |     |   | semester 3 |     |   | semester 4 |   |   |  |  |
|     |  |     |                  |    |     |            | L          | O  | E | L          | O   | E | L          | O   | E | L          | O | E |  |  |
| 1   | Fizyka fazy skondensowanej             | E   | 50               | 25 | 25  | 5          | 25         | 25 | 5 |            |     |   |            |     |   |            |   |   |  |  |
| 2   | Fizyka kwantowa                        | E   | 50               | 30 | 20  | 5          | 30         | 20 | 5 |            |     |   |            |     |   |            |   |   |  |  |
| 3   | Fizyka statystyczna                    | E   | 40               | 20 | 20  | 4          | 20         | 20 | 4 |            |     |   |            |     |   |            |   |   |  |  |
| 4   | Metody matematyczne fizyki             | E   | 60               | 30 | 30  | 5          | 30         | 30 | 5 |            |     |   |            |     |   |            |   |   |  |  |
| 5   | Numerical Methods                      | E   | 40               | 10 | 30  | 4          | 10         | 30 | 4 |            |     |   |            |     |   |            |   |   |  |  |
| 6   | Fizyka materiałów magnetycznych        | E   | 30               | 10 | 20  | 3          |            |    |   | 10         | 20  | 3 |            |     |   |            |   |   |  |  |
| 7   | Fizyka materiałów półprzewodnikowych   | E   | 40               | 10 | 30  | 4          |            |    |   | 10         | 30  | 4 |            |     |   |            |   |   |  |  |
| 8   | Metody spektroskopowe                  | E   | 40               | 20 | 20  | 4          |            |    |   | 20         | 20  | 4 |            |     |   |            |   |   |  |  |
| 9   | Oddziaływanie promieniowania z materią | E   | 20               | 10 | 10  | 3          |            |    |   | 10         | 10  | 3 |            |     |   |            |   |   |  |  |
| 10  | Optyka klasyczna                       | E   | 50               | 20 | 30  | 5          |            |    |   | 20         | 30  | 5 |            |     |   |            |   |   |  |  |
| 11  | Pracownia fizyczna                     | Z   | 100              |    | 100 | 8          |            |    |   |            | 100 | 8 |            |     |   |            |   |   |  |  |
| 12  | Symulacje komputerowe                  | Z   | 30               |    | 30  | 3          |            |    |   |            | 30  | 3 |            |     |   |            |   |   |  |  |
| 13  | Fizyka materiałów mezoskopowych        | E   | 60               | 40 | 20  | 6          |            |    |   |            |     |   | 40         | 20  | 6 |            |   |   |  |  |
| 14  | Mikrosensory                           | E   | 50               | 20 | 30  | 5          |            |    |   |            |     |   | 20         | 30  | 5 |            |   |   |  |  |
| 15  | Modelowanie numeryczne ciał stałych    | E   | 40               | 10 | 30  | 4          |            |    |   |            |     |   | 10         | 30  | 4 |            |   |   |  |  |
| 16  | Nanofizyka                             | E   | 60               | 60 |     | 5          |            |    |   |            |     |   | 60         |     | 5 |            |   |   |  |  |
| 17  | Optyka nieliniowa                      | E   | 20               | 20 |     | 3          |            |    |   |            |     |   | 20         |     | 3 |            |   |   |  |  |
| 18  | Pracownia magisterska                  | Z   | 100              |    | 100 | 4          |            |    |   |            |     |   |            | 100 | 4 |            |   |   |  |  |

|    |   |   |                 |    |  |            |            |            |           |            |            |           |           |            |           |            |            |           |          |          |          |
|----|---|---|-----------------|----|--|------------|------------|------------|-----------|------------|------------|-----------|-----------|------------|-----------|------------|------------|-----------|----------|----------|----------|
| 19 | Zaawansowana fizyka fazy skondensowanej | E | 20              | 20 |  | 3          |            |            |           |            |            |           |           |            | 20        |            | 3          |           |          |          |          |
|    |   |   | <b>TOTAL A:</b> |    |  | <b>900</b> | <b>355</b> | <b>545</b> | <b>83</b> | <b>115</b> | <b>125</b> | <b>23</b> | <b>70</b> | <b>240</b> | <b>30</b> | <b>170</b> | <b>180</b> | <b>30</b> | <b>0</b> | <b>0</b> | <b>0</b> |

### Internships and field work

| No.                                      | Module   | E/C | form of teaching |          |            | Total ECTS | year 1     |          |          |            |          |          | year 2     |          |          |            |          |          |          |            |           |
|--|----------|-----|------------------|----------|------------|------------|------------|----------|----------|------------|----------|----------|------------|----------|----------|------------|----------|----------|----------|------------|-----------|
|  |          |     | Total            | L        | O          |            | semester 1 |          |          | semester 2 |          |          | semester 3 |          |          | semester 4 |          |          |          |            |           |
|  |          |     |                  |          |            |            | L          | O        | E        | L          | O        | E        | L          | O        | E        | L          | O        | E        |          |            |           |
| 1  | Praktyka | Z   | 200              |          | 200        | 30         |            |          |          |            |          |          |            |          |          |            |          |          |          | 200        | 30        |
| <b>TOTAL Internships and field work:</b> |          |     | <b>200</b>       | <b>0</b> | <b>200</b> | <b>30</b>  | <b>0</b>   | <b>0</b> | <b>0</b> | <b>0</b>   | <b>0</b> | <b>0</b> | <b>0</b>   | <b>0</b> | <b>0</b> | <b>0</b>   | <b>0</b> | <b>0</b> | <b>0</b> | <b>200</b> | <b>30</b> |

### Other requirements

| No.                              | Module                                   | E/C | form of teaching |            |            | Total ECTS | year 1     |           |            |            |            |           | year 2     |           |             |            |          |          |          |          |          |          |
|----------------------------------|--|-----|------------------|------------|------------|------------|------------|-----------|------------|------------|------------|-----------|------------|-----------|-------------|------------|----------|----------|----------|----------|----------|----------|
|                                  |  |     | Total            | L          | O          |            | semester 1 |           |            | semester 2 |            |           | semester 3 |           |             | semester 4 |          |          |          |          |          |          |
|                                  |  |     |                  |            |            |            | L          | O         | E          | L          | O          | E         | L          | O         | E           | L          | O        | E        |          |          |          |          |
| 1                                | Advanced English Language Course         | E   | 30               |            | 30         | 2          |            | 30        | 2          |            |            |           |            |           |             |            |          |          |          |          |          |          |
| 2                                | Przedmiot z obszaru nauk humanistycznych | Z   | 30               | 30         |            | 3          | 30         |           | 3          |            |            |           |            |           |             |            |          |          |          |          |          |          |
| 3                                | Przedmiot z obszaru nauk społecznych     | Z   | 30               | 30         |            | 2          | 30         |           | 2          |            |            |           |            |           |             |            |          |          |          |          |          |          |
| <b>TOTAL Other requirements:</b> |  |     | <b>90</b>        | <b>60</b>  | <b>30</b>  | <b>7</b>   | <b>60</b>  | <b>30</b> | <b>7</b>   | <b>0</b>   | <b>0</b>   | <b>0</b>  | <b>0</b>   | <b>0</b>  | <b>0</b>    | <b>0</b>   | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> |
| <b>TOTAL:</b>                    |  |     | <b>1190</b>      | <b>415</b> | <b>775</b> | <b>120</b> | <b>330</b> | <b>30</b> | <b>310</b> | <b>30</b>  | <b>350</b> | <b>30</b> | <b>200</b> | <b>30</b> | <b>1190</b> |            |          |          |          |          |          |          |

The study ends with the awarding of a Master's Degree in the field of Physics: Nanophysics and Mesoscopic Materials - Modelling and Applications.

#### Legend

Each semester consists of 15 weeks

E/C - examination/course work

E - ECTS

L - lecture, O - all forms of teaching excluding lecture (practical classes, laboratory classes, discussion classes, seminar, proseminar, language classes, field practice, workshop, internship, tutoring)

Plan studiów zatwierdzony przez Radę Wydziału w dniu 20.06.2017 r.

#### Otrzymują:

1. Dział Kształcenia
2. Wydział Matematyki, Fizyki i Chemii
3. Dziekanat

.....  
(pieczęć i podpis Dyrektora Instytutu)

.....  
(pieczęć i podpis Dziekana)

|    |  |  |
|----|--|--|
| 1. | Field of study   | Physics  |
| 2. | Academic year of entry                                       | 2017/2018 (winter term), 2018/2019 (winter term) |
| 3. | Academic year for which the revised course structure applies | 2017/2018  |
| 4. | Level of qualifications/degree                               | second-cycle studies                             |
| 5. | Degree profile   | general academic                                 |
| 6. | Mode of study  | full-time  |
| 7. | ISCED code   | 0533 (Physics)                                   |

### Specialization: Theoretical Physics – Programme in English

A

| No.             | Module   | E/C | form of teaching |            |            |            | year 1     |            |           |            |            |           | year 2     |           |           |            |           |           |    |    |
|-----------------|--|-----|------------------|------------|------------|------------|------------|------------|-----------|------------|------------|-----------|------------|-----------|-----------|------------|-----------|-----------|----|----|
|                 |  |     | Total            | L          | O          | Total ECTS | semester 1 |            |           | semester 2 |            |           | semester 3 |           |           | semester 4 |           |           |    |    |
|                 |  |     |                  |            |            |            | L          | O          | E         | L          | O          | E         | L          | O         | E         | L          | O         | E         |    |    |
| 1               | Laboratory of Physics  | Z   | 60               |            | 60         | 10         |            | 60         | 10        |            |            |           |            |           |           |            |           |           |    |    |
| 2               | Master's Seminar I   | Z   | 15               |            | 15         | 3          |            | 15         | 3         |            |            |           |            |           |           |            |           |           |    |    |
| 3               | Quantum field theory   | E   | 90               | 45         | 45         | 9          | 45         | 45         | 9         |            |            |           |            |           |           |            |           |           |    |    |
| 4               | Selected Topics of Quantum Physics T                           | E   | 60               | 30         | 30         | 6          | 30         | 30         | 6         |            |            |           |            |           |           |            |           |           |    |    |
| 5               | M. Sc. Thesis Laboratory part I, Preparation of M.Sc Project   | Z   | 30               |            | 30         | 8          |            |            |           |            | 30         | 8         |            |           |           |            |           |           |    |    |
| 6               | Master's Seminar II  | Z   | 15               |            | 15         | 3          |            |            |           |            | 15         | 3         |            |           |           |            |           |           |    |    |
| 7               | Selected Topics of Solid State Physics                         | E   | 30               | 30         |            | 4          |            |            |           | 30         | 4          |           |            |           |           |            |           |           |    |    |
| 8               | Specialized Lecture I  | E   | 60               | 30         | 30         | 7          |            |            |           | 30         | 30         | 7         |            |           |           |            |           |           |    |    |
| 9               | Statistical Physics  | E   | 75               | 30         | 45         | 8          |            |            |           | 30         | 45         | 8         |            |           |           |            |           |           |    |    |
| 10              | M. Sc. Thesis Laboratory part II, Preparation of M.Sc Project  | Z   | 30               |            | 30         | 11         |            |            |           |            |            |           |            | 30        | 11        |            |           |           |    |    |
| 11              | Master's Seminar III   | Z   | 15               |            | 15         | 1          |            |            |           |            |            |           |            | 15        | 1         |            |           |           |    |    |
| 12              | Selected Topics of Theoretical Physics T                       | E   | 30               | 30         |            | 3          |            |            |           |            |            |           | 30         |           | 3         |            |           |           |    |    |
| 13              | Specialized Lecture IA   | E   | 30               | 30         |            | 3          |            |            |           |            |            |           | 30         |           | 3         |            |           |           |    |    |
| 14              | Specialized Lecture II   | E   | 60               | 30         | 30         | 4          |            |            |           |            |            |           | 30         | 30        | 4         |            |           |           |    |    |
| 15              | Specialized Lecture III  | E   | 30               | 30         |            | 3          |            |            |           |            |            |           | 30         |           | 3         |            |           |           |    |    |
| 16              | M. Sc. Thesis Laboratory part III, Preparation of M.Sc Project | Z   | 60               |            | 60         | 27         |            |            |           |            |            |           |            |           |           |            |           |           | 60 | 27 |
| 17              | Master's Seminar IV  | Z   | 15               |            | 15         | 3          |            |            |           |            |            |           |            |           |           |            |           |           | 15 | 3  |
| <b>TOTAL A:</b> |  |     | <b>705</b>       | <b>285</b> | <b>420</b> | <b>113</b> | <b>75</b>  | <b>150</b> | <b>28</b> | <b>90</b>  | <b>120</b> | <b>30</b> | <b>120</b> | <b>75</b> | <b>25</b> | <b>0</b>   | <b>75</b> | <b>30</b> |    |    |

### Other requirements

| No. | Module                           | E/C | form of teaching |    |    |            | year 1     |    |   |            |   |   | year 2     |   |   |            |   |   |  |  |  |
|-----|----------------------------------|-----|------------------|----|----|------------|------------|----|---|------------|---|---|------------|---|---|------------|---|---|--|--|--|
|     |                                  |     | Total            | L  | O  | Total ECTS | semester 1 |    |   | semester 2 |   |   | semester 3 |   |   | semester 4 |   |   |  |  |  |
|     |                                  |     |                  |    |    |            | L          | O  | E | L          | O | E | L          | O | E | L          | O | E |  |  |  |
| 1   | Advanced English Language Course | Z   | 30               |    | 30 | 2          |            | 30 | 2 |            |   |   |            |   |   |            |   |   |  |  |  |
| 2   | Humanities science               | Z   | 30               | 30 |    | 3          |            |    |   |            |   |   | 30         |   | 3 |            |   |   |  |  |  |

|                                  |                |   |            |            |            |            |            |           |            |           |            |           |            |           |          |          |          |          |  |
|----------------------------------|----------------|---|------------|------------|------------|------------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|----------|----------|----------|----------|--|
| 3                                | Social science | Z | 30         | 30         |            | 2          |            |           |            |           |            |           | 30         |           | 2        |          |          |          |  |
| <b>TOTAL Other requirements:</b> |                |   | <b>90</b>  | <b>60</b>  | <b>30</b>  | <b>7</b>   | <b>0</b>   | <b>30</b> | <b>2</b>   | <b>0</b>  | <b>0</b>   | <b>0</b>  | <b>60</b>  | <b>0</b>  | <b>5</b> | <b>0</b> | <b>0</b> | <b>0</b> |  |
| <b>TOTAL:</b>                    |                |   | <b>795</b> | <b>345</b> | <b>450</b> | <b>120</b> | <b>255</b> | <b>30</b> | <b>210</b> | <b>30</b> | <b>255</b> | <b>30</b> | <b>75</b>  | <b>30</b> |          |          |          |          |  |
| <b>TOTAL</b>                     |                |   |            |            |            |            |            |           |            |           |            |           | <b>795</b> |           |          |          |          |          |  |

The study ends with the awarding of a Master's Degree in the field of Physics: Theoretical Physics – Programme in English.

**Legend**

Each semester consists of 15 weeks

E/C - examination/course work

E - ECTS

L - lecture, O - all forms of teaching excluding lecture (practical classes, laboratory classes, discussion classes, seminar, proseminar, language classes, field practice, workshop, internship, tutoring)

Plan studiów zatwierdzony przez Radę Wydziału w dniu 20.06.2017 r.

Otrzymują:

1. Dział Kształcenia
2. Wydział Matematyki, Fizyki i Chemii
3. Dziekanat

.....  
(pieczęć i podpis Dyrektora Instytutu)

.....  
(pieczęć i podpis Dziekana)