**PLAN OF FULL-TIME STUDIES**
Degree course: MATHEMATICS - second-cycle course
Course delivery method: full-time course

Recruitment in the academic year 2023/2024
Duration: 4 semesters

University of Zielona Góra
Faculty of Mathematics, Computer Science and Econometrics

| No. | | COURSE NAME | Hours per semester | ECTS | Form of assignment | SEMESTER 1 | | | | | | | | SEMESTER 2 | | | | | | | | SEMESTER 3 | | | | | | | | SEMESTER 4 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Form of classes | | | | | | Form of assignment | ECTS | Form of classes | | | | | | Form of assignment | ECTS | Form of classes | | | | | | Form of assignment | ECTS | Form of classes | | | | | | Form of assignment | ECTS |
| | | | | | | L | C | Lab | P | S | Pra | | | L | C | Lab | P | S | Pra | | | L | C | Lab | P | S | Pra | | | L | C | Lab | P | S | Pra | | |
| 1 | Compulsory subjects module (general, basic and course) | English 1 | 30 | 2 | O | | | 30 | | | | O | 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | English 2 | 30 | 2 | E | | | | | | | | | | | 30 | | | | E | 2 | | | | | | | | | | | | | | | | |
| 3 | | Functional Analysis | 60 | 6 | EO | | | | | | | | | 30 | 30 | | | | | EO | 6 | | | | | | | | | | | | | | | | |
| 4 | | Real and Complex Analysis | 60 | 7 | EO | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | Topology | 60 | 7 | EO | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | Differential Geometry | 60 | 7 | EO | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | Discrete Mathematics and Mathematical Foundations of Computer Science | 60 | 7 | EO | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | Partial Differential Equations | 90 | 10 | EOO | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | 30 | | | | EOO | 10 |
| 9 | | Diploma Seminar 1 | 30 | 3 | O | | | | | | | | | | | | | 30 | | O | 3 | | | | | | | | | | | | | | | | |
| 10 | | Diploma Seminar 2 | 60 | 6 | O | | | | | | | | | | | | | | | | | | | | | 60 | | O | 6 | | | | | | | | |
| 11 | | Diploma Seminar 3 | 60 | 9 | Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 60 | | Z | 9 |
| 1 | Specialty - Mathematical Computer Science | Combinatorial Analysis | 60 | 5 | OO | | | | | | | | | 30 | 30 | | | | | OO | 5 | | | | | | | | | | | | | | | | |
| 2 | | Data Warehouse | 45 | 5 | OO | | | | | | | | | 15 | | 30 | | | | OO | 5 | | | | | | | | | | | | | | | | |
| 3 | | Specialist Laboratory Class | 30 | 3 | O | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | | | O | 3 |
| 4 | | Algorithmical Methods | 45 | 6 | EO | | | | | | | | | | | | | | | | | 15 | | 30 | | | | EO | 6 | | | | | | | | |
| 5 | | Specialist Seminar 1 | 30 | 2 | O | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | | | | | | | | | |
| 6 | | Specialist Seminar 2 | 30 | 2 | O | | | | | | | | | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | |
| 7 | | Specialist Seminar 3 | 30 | 2 | Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | Z | 2 |
| 8 | | Topics in Discrete Mathematics 1 | 60 | 7 | EO | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | |
| 9 | | Topics in Discrete Mathematics 2 | 60 | 7 | EO | | | | | | | | | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | |
| 10 | | Monographic Lecture | 30 | 4 | E | | | | | | | | | | | | | | | | | 30 | | | | | | E | 4 | | | | | | | | |
| 1 | Specialty – Mathematics and Computer Science in Economics | Operations Research | 45 | 6 | EO | | | | | | | | | | | | | | | | | 15 | | 30 | | | | EO | 6 | | | | | | | | |
| 2 | | Econometrics | 90 | 8 | OOO | | | | | | | | | | | | | | | | | 30 | 30 | 30 | | | | OOO | 8 | | | | | | | | |
| 3 | | Mathematical Economics 2 | 60 | 7 | EO | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | |
| 4 | | Mathematical Programming | 90 | 10 | EOO | | | | | | | | | 30 | 30 | 30 | | | | EOO | 10 | | | | | | | | | | | | | | | | |
| 5 | | Specialist Seminar 1 | 30 | 2 | O | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | | | | | | | | | |
| 6 | | Specialist Seminar 2 | 30 | 2 | O | | | | | | | | | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | |
| 7 | | Specialist Seminar 3 | 30 | 2 | Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | Z | 2 |
| 8 | | Game Theory in Economics | 45 | 6 | EO | | | | | | | | | | | | | | | | | 30 | 15 | | | | | EO | 6 | | | | | | | | |
| 1 | Specialty – Mathematics and Computer Science in Finance and Insurance | Financial Engineering | 60 | 8 | EOO | | | | | | | | | | | | | | | | | 30 | 15 | 15 | | | | EOO | 8 | | | | | | | | |
| 2 | | Actuarial Methods | 60 | 7 | EO | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | |
| 3 | | Stochastic Processes 1 | 60 | 7 | EO | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | |
| 4 | | Stochastic Processes 2 | 60 | 7 | EO | | | | | | | | | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | |
| 5 | | Specialist Seminar 1 | 30 | 2 | O | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | | | | | | | | | |
| 6 | | Specialist Seminar 2 | 30 | 2 | O | | | | | | | | | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | |
| 7 | | Specialist Seminar 3 | 30 | 2 | Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | Z | 2 |
| 8 | | Time Series | 90 | 8 | OOO | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | 30 | | | | OOO | 8 |
| 1 | Specialty - Mathematical Modelling | Qualitative Theory of Differential Equations | 60 | 8 | EOO | | | | | | | | | | | | | | | | | 30 | 15 | 15 | | | | EOO | 8 | | | | | | | | |
| 2 | | Stochastic Processes 1 | 60 | 7 | EO | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | |
| 3 | | Specialist Seminar 1 | 30 | 2 | O | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | | | | | | | | | |
| 4 | | Specialist Seminar 2 | 30 | 2 | O | | | | | | | | | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | |
| 5 | | Specialist Seminar 3 | 30 | 2 | Z | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | Z | 2 |
| 6 | | Control Theory 1 | 60 | 7 | EO | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | | | | | | | | |
| 7 | | Control Theory 2 | 60 | 7 | EO | | | | | | | | | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | |
| 8 | | Selected Problems of Mathematical Modelling | 90 | 8 | OOO | | | | | | | | | | | | | | | | | 30 | 30 | 30 | | | | OOO | 8 | | | | | | | | |

| | Hours per semester | ECTS | Form of assignment | Semester 1 | | | Semester 2 | | | Semester 3 | | | Semester 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compulsory subjects module | 600 | 66 | 7 E | 270 | 4 E | 30 | 120 | 2 E | 11 | 60 | 0 E | 6 | 150 | 1 E | 19 |
| Specialty - Mathematical Computer Science | 420 | 43 | 4 E | 0 | 0 E | 0 | 195 | 1 E | 19 | 165 | 3 E | 19 | 60 | 0 E | 5 |
| Specialty – Mathematics and Computer Science in Economics | 420 | 43 | 4 E | 0 | 0 E | 0 | 180 | 2 E | 19 | 210 | 2 E | 22 | 30 | 0 E | 2 |
| Specialty – Mathematics and Computer Science in Finance and Insurance | 420 | 43 | 4 E | 0 | 0 E | 0 | 150 | 2 E | 16 | 150 | 2 E | 17 | 120 | 0 E | 10 |
| Specialty - Mathematical Modeling | 420 | 43 | 4 E | 0 | 0 E | 0 | 150 | 2 E | 16 | 240 | 2 E | 25 | 30 | 0 E | 2 |
| **Total (specialty - Mathematical Computer Science)** | **1020** | **109** | **11 E** | **270** | **4 E** | **30** | **315** | **3 E** | **30** | **225** | **3 E** | **25** | **210** | **1 E** | **24** |
| **Total (specialty – Mathematics and Computer Science in Economics)** | **1020** | **109** | **11 E** | **270** | **4 E** | **30** | **300** | **4 E** | **30** | **270** | **2 E** | **28** | **180** | **1 E** | **21** |
| **Total (specialty – Mathematics and Computer Science in Finance and Insurance)** | **1020** | **109** | **11 E** | **270** | **4 E** | **30** | **270** | **4 E** | **27** | **210** | **2 E** | **23** | **270** | **1 E** | **29** |
| **Total (specialty - Mathematical Modelling)** | **1020** | **109** | **11 E** | **270** | **4 E** | **30** | **270** | **4 E** | **27** | **300** | **2 E** | **31** | **180** | **1 E** | **21** |

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|---|---|---|
| **Total without practices** | **1020** | **109** |

<u>Additional subjects offered for degree course: MATHEMATICS</u>

| No. | | COURSE NAME | SEMESTER 1 | | | | | | | | SEMESTER 2 | | | | | | | | SEMESTER 3 | | | | | | | | SEMESTER 4 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Form of classes | | | | | | Form of assignment | ECTS | Form of classes | | | | | | Form of assignment | ECTS | Form of classes | | | | | | Form of assignment | ECTS | Form of classes | | | | | | Form of assignment | ECTS |
| | | | L | C | Lab | P | S | Pra | | | L | C | Lab | P | S | Pra | | | L | C | Lab | P | S | Pra | | | L | C | Lab | P | S | Pra | | |
| 1 | ADDITIONAL | Combinatorial Analysis | | | | | | | | | 30 | 30 | | | | | OO | 5 | | | | | | | | | 30 | 30 | | | | | OO | 5 |
| 2 | | Web Applications | | | | | | | | | 30 | | 30 | | | | OO | 4 | | | | | | | | | 30 | | 30 | | | | OO | 4 |
| 3 | | Operations Research | | | | | | | | | | | | | | | | | 15 | | 30 | | | | EO | 6 | | | | | | | | |
| 4 | | Econometrics | | | | | | | | | | | | | | | | | 30 | 30 | 30 | | | | OOO | 8 | | | | | | | | |
| 5 | | Mathematical Economics 2 | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | 30 | 30 | | | | | EO | 7 |
| 6 | | History of Mathematics | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 15 | | | | | OO | 4 |
| 7 | | Data Warehouse | | | | | | | | | 15 | | 30 | | | | OO | 5 | | | | | | | | | 15 | | 30 | | | | OO | 5 |
| 8 | | Financial Engineering | | | | | | | | | | | | | | | | | 30 | 15 | 15 | | | | EOO | 8 | | | | | | | | |
| 9 | | Qualitative Theory of Differential Equations | | | | | | | | | | | | | | | | | 30 | 15 | 15 | | | | EOO | 8 | | | | | | | | |
| 10 | | Computer Image Processing | | | | | | | | | | | | | | | | | 15 | | | 30 | | | OO | 4 | | | | | | | | |
| 11 | | Specialist Laboratory Class | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | | | O | 3 |
| 12 | | LaTeX | | | | | | | | | | | 30 | | | | O | 2 | | | | | | | | | | | | | | | | |
| 13 | | Actuarial Methods | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | 30 | 30 | | | | | EO | 7 |
| 14 | | Algorithmical Methods | | | | | | | | | | | | | | | | | 15 | | 30 | | | | EO | 6 | | | | | | | | |
| 15 | | Numerical Methods 2 | | | | | | | | | | | | | | | | | 30 | 30 | 30 | | | | EOO | 10 | | | | | | | | |
| 16 | | Mathematical Modelling 1 | | | | | | | | | | | | | | | | | 30 | | 30 | | | | EO | 7 | | | | | | | | |
| 17 | | Mathematical Modelling 2 | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | 30 | | | | EO | 7 |
| 18 | | Modelling in Finance 2 | | | | | | | | | | | | | | | | | 30 | | 30 | | | | EO | 6 | | | | | | | | |
| 19 | | Mathematical Workshop 2 | | | | | | | | | | 30 | | | | | O | 5 | | | | | | | | | | 30 | | | | | O | 5 |
| 20 | | Stochastic Processes 1 | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | 30 | 30 | | | | | EO | 7 |
| 21 | | Stochastic Processes 2 | | | | | | | | | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | |
| 22 | | Quantum Computing | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | 30 | | | | OO | 5 |
| 23 | | Mathematical Programming | | | | | | | | | 30 | 30 | 30 | | | | EOO | 10 | | | | | | | | | 30 | 30 | 30 | | | | EOO | 10 |
| 24 | | Specialist Seminar 1 | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | | | | | | | | | |
| 25 | | Specialist Seminar 2 | | | | | | | | | | | | | | | | | | | | | 30 | | O | 2 | | | | | | | | |
| 26 | | Specialist Seminar 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 30 | | Z | 2 |
| 27 | | Computer Networks | | | | | | | | | 30 | | 30 | | | | EO | 5 | | | | | | | | | 30 | | 30 | | | | EO | 5 |
| 28 | | Time Series | | | | | | | | | | | | | | | | | | | | | | | | | 30 | 30 | 30 | | | | OOO | 8 |
| 29 | | Game Theory in Economics | | | | | | | | | | | | | | | | | 30 | 15 | | | | | EO | 6 | | | | | | | | |
| 30 | | Control Theory 1 | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | 30 | 30 | | | | | EO | 7 |
| 31 | | Control Theory 2 | | | | | | | | | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | |
| 32 | | Selected Problems of Mathematical Modelling | | | | | | | | | | | | | | | | | 30 | 30 | 30 | | | | OOO | 8 | | | | | | | | |
| 33 | | Topics in Discrete Mathematics 1 | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | | 30 | 30 | | | | | EO | 7 |
| 34 | | Topics in Discrete Mathematics 2 | | | | | | | | | | | | | | | | | 30 | 30 | | | | | EO | 7 | | | | | | | | |
| 35 | | Monographic Lecture | | | | | | | | | | | | | | | | | 30 | | | | | | E | 4 | | | | | | | | |
| 1 | HUMANITIES | English for Specific Purposes | | | | | | | | | | | | | | | | | | 30 | | | | | O | 3 | | 30 | | | | | O | 3 |
| 2 | | Practical Stylistics | | | | | | | | | | 30 | | | | | O | 3 | | | | | | | | | | 30 | | | | | O | 3 |
| 1 | SOCIAL | Pedagogy 2 | | | | | | | | | | 30 | | | | | O | 2 | | | | | | | | | | 30 | | | | | O | 2 |
| 2 | | Psychology 2 | | | | | | | | | | 30 | | | | | O | 2 | | | | | | | | | | 30 | | | | | O | 2 |

Recommended:
Resolution No. 16 of the Mathematics Discipline Council of 08 March 2023

Approved by Faculty Education Council at the Faculty of Mathematics, Computer Science and Econometrics:
Resolution no 1 of 09 March 2023