

UNIVERSITY OF ZIELONA GÓRA

FACULTY OF MATHEMATICS, COMPUTER SCIENCE AND ECONOMETRICS

FULL-TIME COURSE PROGRAMME

degree course: **DATA ENGINEERING**

cycle: **second-cycle course**

profile: **general academic**

Recruitment in the academic year

2024/2025

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

1. General characteristics of the degree course

Degree course	Mathematics
Cycle	Second cycle
Profile	General academic
Course delivery method	Full-time course
Indication of scientific or artistic disciplines to which the learning outcomes apply (including the major) and specification of the percentage share of ECTS credits necessary to obtain qualifications corresponding to the level of education	Exact and natural science Discipline: Mathematics (68 ECTS credits - 76%) - main Computer Science (22 ECTS credits - 24%)
Indication of the professional title awarded to graduates	Master's degree
Information on the scientific category held by the basic organisational unit of the university	B

2. Indication of the relationship between the degree course and the university's mission and development strategy

The introduction of the second-cycle course is in line with the objective [K2] "Expanding the educational offer - orientation of the effects of education towards the needs of the labour market" indicated in the "Development strategy of the University of Zielona Góra until 2020" in the area of "Education".

It is also in line with strategic goals of the Faculty set out in the Strategy for the Development of the Faculty of Mathematics, Computer Science and Econometrics until 2020 as [WK1]: "Development of mathematics and information technology education at all levels", with regard to the increasing number of students at the Faculty and the interest in the offered courses.

3. Description of the competencies expected from candidates applying for admission to the first- and second cycles or a single-cycle programmes.

Persons with M.A., M.Sc. Bachelor' degrees or equivalent are eligible for the second-cycle course. Candidates applying for admission should possess competences necessary to undertake

education at a second-cycle course in the field of Data Engineering, in particular:

- they should have basic knowledge of analytical and numerical methods and information technology, as well as should be able to apply it in social and economic contexts;
- they should be familiar with IT tools supporting processing, data analysis and statistical inference.

4. Analysis of the compliance of the assumed learning outcomes with the needs of the labour market

The aim of the course is to prepare students for professional work in positions requiring knowledge and skills in data processing and analysis, as well as for developing professional skills on their own.

The learning outcome is to acquire knowledge and skills in: high level mathematics; the use of analytical, numerical, IT and experimental methods as well as tools necessary in problem-solving processes relevant to the analyst's profession; management and security of IT systems; selection of IT tools supporting processing, data analysis and statistical inference; a foreign language at B2 of the Common European Framework of Reference for Languages of the Council of Europe.

Graduates are prepared to work in independent positions requiring knowledge of mathematical methods and tools (in computer and insurance companies, banks, administration institutions and IT centres, as well as in research institutions and research and development centres).

5. Description of methods of verifying and evaluating students' learning outcomes achieved throughout the entire educational process

The methods of verification and assessment of students' assumed learning outcomes are included in syllabuses for individual subjects.

6. Course programme:

1.1 Description of the assumed learning outcomes, assigning the degree course to particular applicable scientific or artistic disciplines.

In the attachments:

- *Learning outcomes;*
- *Reference table of results to particular learning outcomes;*
- *Reference table - engineering competences.*

1.2 Indicators concerning the programme

Programme indicators concerning the evaluated course	
Number of ECTS credits necessary to obtain qualifications corresponding to the level of education	90 ECTS credits (minimum)

Number of semesters necessary to obtain qualifications corresponding to the level of education	3
The number of ECTS credits assigned to classes requiring direct participation of academic teachers and students	min 45 (50%)
Number of ECTS credits assigned to modules of classes related to research conducted within the discipline or disciplines relevant to the evaluated degree course, for students to acquire in-depth knowledge and the ability to conduct scientific research (for a general academic degree course)	min 79 (87%)
Number of ECTS credits assigned to modules of classes related to practical vocational preparation, aimed at students' acquisition of practical skills and social competences (for degree courses with a practical profile)	-
Number of ECTS credits assigned to classes in the field of humanities or social sciences (in the case of degree courses assigned to disciplines other than humanities or social sciences, respectively)	Humanities – min 3 Social sciences –min 2
Number of ECTS credits assigned to elective courses/modules	min 30 (33%)
Number of ECTS credits assigned to internship and number of hours in internship (if the programme provides for internship)	-
Number of hours of Physical Education classes - in the case of full-	-

Modules of classes related to scientific research conducted in the discipline or disciplines related to the degree course, aimed at students gaining in-depth knowledge and skills in conducting scientific research			
Module	Instructional method	Total number of hours	ECTS credits
Core subjects	L, C, Lab., P	360	41
Diploma Thesis	S	120	15
Subjects offered for the degree course/compulsory subjects for the specialty	L, C, Lab., P	225	min 23

Total:	705	79 (87%)
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General academic profile - includes classes related to the scientific activity conducted at the university in the discipline or disciplines to which the degree course is assigned, in more than 50% of the number of ECTS credits and takes into account students' participation of in classes preparing for conducting scientific activity or participation in this activity.

Modules for elective classes			
Module	Instructional method	Total number of hours	ECTS credits
Subjects offered for the degree course/compulsory subjects for the specialty	L, C, Lab., P	225	min 23
Humanities and social subjects	C C	30 30	min 3 min 2
Elective subjects necessary to obtain 30 ECTS credits per	L, C, Lab., P	30	min 2
Total:		315	min 30 (33%)

The programme allows students to choose classes to which ECTS credits are assigned in the number of not fewer than 30% of ECTS credits.

1.3 Subjects or subject modules - together with learning outcomes and curriculum content to each module, forms and methods ensuring the achievement of these effects, as well as the number of ECTS credits;

Attachment - catalogue of subjects in the SylabUZ system.

1.4 Methods of verifying and evaluating students' achievements of the assumed learning outcomes

They are included in the syllabuses for individual subjects.

Rules regarding diplomas are set out in the resolution: *Rules for the preparation and evaluation of diploma theses at the Faculty of Mathematics, Computer Science and*

Econometrics.

1.5 Study programme

In the attachment

Graduation conditions

The second-cycle degree course of Data Engineering last 1.5 years (3 semesters). The minimum number of ECTS credits is 90. Students should obtain a minimum of 30 ECTS credits in each semester.

- Students of Data Engineering receive a master's degree when:
 1. they have passed their subjects with at least 90 ECTS credits, including:
 - a module of compulsory subjects for the degree course,
 - modules of additional subjects offered with at least 23 ECTS credits,
 - modules of humanities subjects (for a minimum of 3 ECTS credits) and modules of social sciences subjects (for a minimum of 2 ECTS credits) offered with a total number of at least 5 ECTS credits,
 2. they have passed the diploma exam with at least a satisfactory result.
- Students of Data Engineering receive a master's degree with a specialty *Modelling and Data Analysis, Data Exploration Systems* or *Business Analytics* when
 1. they have passed their subjects with at least 90 ECTS credits, including:
 - a module of compulsory subjects for the degree course,
 - modules of additional subjects offered with at least 23 ECTS credits,
 - modules of humanities subjects (for a minimum of 3 ECTS credits) and modules of social sciences subjects (for a minimum of 2 ECTS credits) offered with a total number of at least 5 ECTS credits,

1.6 Duration, principles and form internship.

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