Appendix No. 1.5 to the Resolution No. 61/2025
of the Rector of the University of Rzeszów

SYLLABUS

REGARDING THE QUALIFICATION CYCLE FROM 2026 TO 2029
ACADEMIC YEAR 2027/2028

1. BASIC COURSE/MODULE INFORMATION

Course/Module title	Introduction to R System
Course/Module code *	
Faculty (name of the unit offering the field of study)	Faculty of Exact and Technical Sciences
Name of the unit running the course	Institute of Mathematics
Field of study	Mathematics
Qualification level	First-cycle studies
Profile	General academic
Study mode	Full-time
Year and semester of studies	Year 2, semester 4
Course type	Specialisation course
Language of instruction	English
Coordinator	Sebastian Wójcik, PhD
Course instructor	Sebastian Wójcik, PhD

* - as agreed at the faculty

1.1.Learning format – number of hours and ECTS credits

Semester (no.)	Lectures	Classes	Laboratories	Seminars	Practical classes	Internships	others	**ECTS credits**
4			45					3

1.2. Course delivery methods
☒ traditional classroom-based instruction
☐ no distance learning / or optional use of distance learning methods and techniques

1.3. Course/Module assessment (exam, pass with a grade, pass without a grade)
Pass with a grade

2. PREREQUISITES

Knowledge of basic measures of central tendency and dispersion (secondary school level), basic programming skills.

3. OBJECTIVES, LEARNING OUTCOMES, COURSE CONTENT, AND INSTRUCTIONAL METHODS

3.1. Course/Module objectives

O1	Introducing students to selected capabilities of the R environment in data processing and analysis.
O2	Developing skills in writing simple scripts.
O3	Developing skills in using R libraries.

3.2. COURSE/MODULE LEARNING OUTCOMES (TO BE COMPLETED BY THE COORDINATOR)

Learning Outcome	The description of the learning outcome defined for the course/module	Relation to the degree programme outcomes
LO_01	The student knows basic capabilities of the R environment in data processing and analysis	K_W05, K_W06
LO_02	The student is able to use the R environment to perform various analyses involving basic statistics, methods, and statistical models.	K_U15
LO_03	The student is able to work effectively in a team on a project using the R environment.	K_U21
LO_04	Through knowledge of R and scripting skills, the student is ready to fulfil social responsibilities related to data analysis and processing work.	K_K04
LO_05	The student is ready to take action in solving problems and performing tasks typical for professions related to data analysis and processing in the R environment.	K_K05

3.3. Course content (to be completed by the coordinator)

A. Lectures

B. Classes, laboratories, seminars, practical classes

Content outline
RStudio interface.
Installation and loading of packages.
Importing data via commands and wizard tools.
Vectors, matrices, data frames, lists.
Arithmetic and logical expressions.
Conditional statements and loops.
Defining user functions.
Pipeline data processing using the *dplyr* package.
Data visualization

3.4. Methods of Instruction

Computer-based work, practical project work

4. Assessment techniques and criteria

4.1 Methods of evaluating learning outcomes

Learning outcome	Methods of assessment of learning outcomes (e.g. test, oral exam, written exam, project, report, observation during classes)	Learning format (lectures, classes,...)
LO-01	Test	lab
LO-02	Project	lab
LO-03	Project	lab
LO-04	Observation during classes	lab
LO-05	Observation during classes	lab

4.2 Course assessment criteria

The course is assessed based on a computer-based test and a project involving data analysis assigned by the instructor. Passing requires achieving at least a satisfactory grade in both the test and the project. Final grade scale: below 50% – fail 50–59% – satisfactory (3.0) 60–69% – satisfactory plus (3.5) 70–79% – good (4.0) 80–89% – good plus (4.5) 90–100% – very good (5.0)

5. Total student workload needed to achieve the intended learning outcomes – number of hours and ECTS credits

Activity	Number of hours
Course hours	45
Other contact hours involving the teacher (consultation hours, examinations)	2
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	40
Total number of hours	87
Total number of ECTS credits	3

* One ECTS point corresponds to 25-30 hours of total student workload

6. Internships related to the course/module

Number of hours	*Not applicable*
Internship regulations and procedures	*Not applicable*

7. Instructional materials

Compulsory literature: Douglas A., Roos D., Mancini F., Couto A. & Lusseau D. An Introduction to R (online https://intro2r.com/) https://rstudio.github.io/r-manuals/r-intro/ Learning RStudio for R Statistical Computing. Learn to effectively perform R development, statistical analysis, and reporting with the most popular R IDE / Mark van der Loo, Edwin de Jonge, Packt Publishing R Programming By Example. Practical, hands-on projects to help you get started with R / Omar Trejo Navarro, Packt Publishing

Complementary literature: Graphing Data with R. An Introduction / John Jay Hilfiger, O'Reilly Media

Approved by the Head of the Department or an authorised person