University of Gdańsk

Subject card

Subject name and code	Introduction to R programming, PG_00117805		
Field of study	Chemistry		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	Master's studies	Subject group	Obligatory subject group in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	English
Semester of study	2	ECTS credits	2.0
Learning profile	academic	Assessment form	exam
Conducting unit	Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Tomasz Puzyn	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	15	2.0	33.0	50

Subject objectives

Aims of education

- familiarize students with the R programming language and software environment
- presenting the benefits of using R for exploratory data analysis and data visualizations
- familiarize students with basic R programming concepts to automate data analysis and data visualizations

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_K02] Is able to undertake a variety of roles in the team, including supervisory ones.	At the completion of this course, the student is expected to understand the principles of working safely, responsibly, and efficiently using the workstations connected to the Internet, as well as understand the social aspects of practical use of knowledge and abilities as well as connected with them responsibility.	[SK4] test/exam - oral or written
[CHEMMU2_W09] Classifies specialist IT tools used in statistical evaluation of experiment results.	At the completion of this course, the student is expected to describe and summarize the differences between R, RStudio and RStudioCloud.	[SW4] test/exam - oral or written
[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	At the completion of this course, the student is expected to design and establish custom approaches for analyzing, visualizing and critical interpreting obtained results, as well as use help pages such as StackOverflow to find relevant information and/or solve problems.	[SU4] test/exam - oral or written
[CHEMMU2_W06] Applies mathematics to the extent necessary to understand, describe and model chemical processes of medium complexity.	At the completion of this course, the student is expected to know and understand the fundamental R functions for data manipulation, exploratory data analysis and data visualizations.	[SW4] test/exam - oral or written
[CHEMMU2_U03] Finds necessary information in specialist literature, databases and other sources, lists basic scientific journals in chemistry.	At the completion of this course, the student is expected to use web resources such as CRAN, Github or Bioconductor to find, install and load the suitable packages.	[SU4] test/exam - oral or written
[CHEMMU2_W08] Demonstrates knowledge of theoretical computational and IT methods used to solve problems in chemistry.	At the completion of this course, the student is expected to know the most important and useful R functions and R packages for data manipulations, exploratory data analysis and data visualizations.	[SW4] test/exam - oral or written
[CHEMMU2_K06] Undertakes research tasks consciously and responsibly, understanding the social aspects of the practical application of the acquired knowledge and skills and the responsibility related to it.	At the completion of this course, the student is expected to understand the principles of working safely, responsibly, and efficiently using the workstations connected to the Internet, as well as understand the social aspects of practical use of knowledge and abilities as well as connected with them responsibility.	[SK4] test/exam - oral or written

Subject contents

The course covers practical issues in statistical computing, exploratory data analysis and data visualizations which includes introduction to R programming (basic data structures; data inspection and manipulation; data formatting and analysis; accessing add-on R packages (how to find, install, and work with them), visualization in R (methods for graphing data), introduction to basic programming structures (writing R functions; loops, if-else statements; organizing and commenting R code; writing documents with R Markdown).

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	51.0%	100.0%

Recommended reading

Basic literature	• Teetor S. 25 Recipes for Getting Started with R: Excerpts from the R Cookbook. O'Reilly Media, 2011 • Murray S. Learn R in a Day. SJ Murray, 2013
Supplementary literature	• Mahoney M. Introduction to Data Exploration and Analysis with R, 2019 • Peng R.D. (2020). R Programming for Data Science, 2020
eResources addresses	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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