GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Scientific research, communication and ethics, PG_00069247						
Field of study	Biotechnology						
Date of commencement of studies	February 2025		Academic year of realisation of subject	2025/2026			
Education level	second-cycle studies		Subject group				
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	3.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Biotechnology and Microbiology -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Christian Jungnickel					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	45
	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	45	5.0	25.0	75

Subject objectives	This postgraduate course delivers an intensive, practice-oriented introduction to scientific research communication, methodology, and ethics, combining advanced lectures with hands-on exercises. Students will systematically explore the principles of scientific communication, plagiarism and referencing, the philosophy of science, peer review, oral and visual presentation skills, grant writing, and publication strategy. The curriculum emphasizes the design and critique of data visualizations, the mechanics of scientific argumentation, and the construction of compelling narratives in research. Special attention is given to the identification and prevention of academic fraud, the analysis of real-world misconduct cases, and the responsible integration of artificial intelligence and large language models into research workflows. Each topic is immediately reinforced through targeted exercisesincluding debates, peer review simulations, critical redesign of graphs and posters, ethical case studies, and scientific writing practiceensuring direct application of theory to practice. By the end of the course, participants will be equipped to communicate research findings clearly and ethically, critically evaluate the quality and integrity of scientific work, and apply best practices in contemporary scientific publishing, preparing them for advanced academic and professional environments.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_K101] acknowledges the importance of knowledge related to the field of study in solving cognitive and practical problems, critically assessing the information obtained	The course developments the ability to recognize the importance of knowledge in scientific communication, methodology, and ethics for solving practical and cognitive research problems. Students systematically practice critical evaluation and selection of information through case analysis, peer review simulations, and practical assignments.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
	[K7_W81] has knowledge of complex grammatical structures and diverse lexical resources needed to communicate in foreign language in terms of general and specialist language related to field of study	The course developments prevention in complex grammatical structures and specialized English vocabulary through systematic exercises in writing, presentations, and analysis of scientific texts. Students regularly communicate in a foreign language, both orally and in writing, while performing tasks typical for academic and scientific environments.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U08] prepares documentation of experiments and technological processes using professional terminology in biotechnology and related fields	The course teaches clear documentation of experiments and research processes using professional scientific terminology. Students complete practical assignments involving the preparation of abstracts, summaries, reports, and manuscript sections in accordance with standards in biotechnology and related fields.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information
	[K7_K01] understands the need to constantly update knowledge based on the state of the art in accordance with the latest scientific literature, improve professional skills and the importance of teamwork	The course emphasizes the need for continuous updating of knowledge based on the latest scientific literature and the development of professional skills, specifically in the context of rapidly evolving ethical and technological standards in science. Practical exercises and teamwork activities foster experience sharing and collaboration within the research environment.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice

Subject contents	

Lectures

1. Introduction to communication
2. Plagiarism and referencing
3. What is truth?
4. Peer Review
5. Oral presentation (theory)
6. Data visualization: graphs and tables (principles)
7. Making posters and conferences
8. Writing a grant
9. Journal selection and screening
10. Crafting a scientific sentence
11. Creating stories/narrative in science
12. What is real research
13. Academic fraud, misconduct, and research ethics (combined)
14. Artificial Intelligence and LLMs in scientific research
15. Scientific writing: abstracts, summaries, and structure

Exercises

1. Group discussion: Effective vs. poor communication
2. Paraphrasing and referencing practice
3. Debate: What is truth in science?
4. Peer review simulation
5. Naked presentation (chalk/board, no slides)
6. Create and critique scientific graphs/tables
7. Design a scientific poster
8. Write a grant abstract/aims section

	9. Journal screening practical exercise 10. Sentence crafting and editing exercise 11. Write a mini story for a scientific finding 12. Analyze and critique a research study 13. Case study: Analyze a real instance of misconduct 14. AI tool workshop: Generate and assess text 15. Abstract and summary writing exercise
Prerequisites and co-requisites	Good ability to communicate in English, both written and spoken.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Practical assignments/homework	50.0%	50.0%
Final written test	50.0%	50.0%

Recommended reading

Basic literature	• Day, R.A. & Gastel, B. (2016). *How to Write and Publish a Scientific Paper* (8th ed.). Cambridge University Press. • Graf, C. et al. (2019). *COPE Ethical Guidelines for Peer Reviewers* . Committee on Publication Ethics (COPE). • Macrina, F.L. (2014). *Scientific Integrity: Text and Cases in Responsible Conduct of Research* (4th ed.). ASM Press. • Kassirer, J.P. & Angell, M. (1994). *The Peer Review Process*. JAMA, 272(2), 9697.
Supplementary literature	• Wager, E. & Kleinert, S. (2011). *Responsible research publication: international standards for authors*. In: Mayer T, Steneck N, eds. *Promoting Research Integrity in a Global Environment*, pp. 309316. • McIntosh, L.D. (2022). *The Visual Display of Quantitative Information* (2nd ed.). Graphics Press.
eResources addresses	

Example issues/ example questions/ tasks being completed	• Write and suggest an appropriate title for the article. • Write and suggest an appropriate abstract for the article (maximum 10 sentences). • List the key differences between a review article and an original research article. • What are the ethical responsibilities of a reviewer in the peer review process? Name at least three. • Discuss how artificial intelligence tools can be used in scientific writing. What are the potential benefits and risks? • Identify one real-world case of scientific misconduct and briefly explain what happened and why it violated ethical principles.
Work placement	Not applicable

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