GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00071345		
Field of study	Mechanical Engineering		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Dariusz Fydrych	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	18.0	0.0	0.0	0.0	0.0	18

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	18	0.0	0.0	18

Subject objectives

The aim of the course is to understand and acquire the skills to apply quantitative methods for analyzing the scientific output of an individual, a research team, or an institution.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U71] is able to apply knowledge from humanistic, social, economic or legal sciences in order to solve problems	The student can solve problems using scientometric methods.	[SU2] Assessment of ability to analyse information
[K7_K71] is able to explain the need to apply knowledge from humanistic, social, economic or legal sciences in order to function in a social environment	The student distinguishes and classifies scientometric methods	[SK5] Assessment of ability to solve problems that arise in practice
[K7_W71] has general knowledge in humanistic, social, economic or legal sciences, including their fundamentals and applications	The student demonstrates the ability to work effectively in a team environment.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

An introduction to scientometrics (definition of scientometrics and scientometrics studies, history and development of the field, connections with bibliometrics and webometrics, objectives and applications in science and industry), indicators for evaluating scientific output (number of publications and citations, h-index, m-index, g-index, Impact Factor, CiteScore, SNIP, SJR, comparative analysis of indicators), data sources and scientific databases (overview of bibliographic databases: Scopus, Web of Science, Google Scholar, ORCID and researcher identifiers, practical search for publications and citation analysis), methods of scientific analysis (quantitative analysis of the scientific output of individuals, teams, and institutions, co-authorship and co-citation maps, analysis of research trends and hot topics, classification and grouping of scientometric methods), evaluation of science and institutions (systems for assessing universities and disciplines, the role of indicators in research funding, comparative analysis of countries and institutions), ethics and good practices (plagiarism and self-plagiarism, predatory journals, manipulation of citation metrics, transparency and reliability of scientific data), and practical applications (evaluation of the scientific output of individuals, teams, and institutions, planning publication strategies, bibliometric and analytical reports, forecasting trends in scientific research).

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test	56.0%	100.0%

<table>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Nowak, P. (2006). Bibliometria, webometria: podstawy, wybrane zastosowania. Wydawnictwo Naukowe UAM.

Van Eck, N., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. scientometrics, 84(2), 523-538.

Świerczyńska, A., Janeczek, A., Pandey, C., Varbai, B., & Fydrych, D. (2026). A bibliometric review of A-TIG welding: unveiling global research trends. The International Journal of Advanced Manufacturing Technology, 1-21.

Maliha, H. (2023). A review on bibliometric application software. Scientometrics Letters, 1(1).

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of informetrics, 11 (4), 959-975.</td></tr>
<tr><td>Supplementary literature</td><td>Kara, B. C., Şahin, A., & Dirsehan, T. (2025). BibexPy: Harmonizing the bibliometric symphony of Scopus and Web of Science. SoftwareX, 30, 102098.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Characterize the quantitative methods for analyzing scientific output.

Describe the role of scientometrics in evaluating the scientific output of an individual, a research team, and an institution.

Describe the risks and problems associated with manipulating citation and publication metrics.

Characterize good publication practices in the context of research ethics.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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