



УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ  
UNIVERSITY OF BANJA LUKA  
ПРИРОДНО-МАТЕМАТИЧКИ ФАКУЛТЕТ  
FACULTY OF NATURAL SCIENCES AND MATHEMATICS



CHEMISTRY DEPARTMENT

PhD STUDIES

Course name	<b>Introduction to Scientometrics, Models of Scientific Journalism, and Index Services</b>			
Course code	Course status	Semester	Hours of instruction	ECTS
<b>DHEM23UUS</b>	elective	I, II, III, or IV	5+0	10
Teacher(s)	<b>Prof. Siniša Subotić, PhD</b>			

Prerequisite course(s)	Entry requirements
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**Course goals**

This course aims to provide an overview of the main principles and practices related to the measurement and evaluation of scientific performance and academic impact, including the "traditional" scientometric analysis of citations in the academic literature, as well as the latest attempts to measure scientific performance through online platforms and social media activities (so-called "altmetrics"). Furthermore, the course will provide students with an insight into the main services used for indexing and evaluation of scientific journals, articles, and other academic actors and entities. Finally, students will be able to familiarize themselves with the most common models of publishing scientific journals, including their "unethical" forms (i.e., "predatory" publishing).

- Learning outcomes**
- Students are introduced to the main purposes, principles, laws, and areas related to scientific measurement and assessment of academic influence (with a primary focus on the field of scientometrics).
  - Students understand and can critically evaluate the use and misuse of common citation indicators, usage metrics, and altmetrics at all comparative levels, ie. between authors, articles, journals, institutions, different scientific fields, etc.
  - Students are familiar with and understand the differences between databases of scientific journals, indexes, reports, and rankings supported by different companies and can make informed decisions about the value, purpose, and common abuses of such services when making their own decisions about their academic career (e.g. choosing a journal in who will send the manuscript).
  - Students are familiar with the advantages and disadvantages of different publishing models of scientific journals.
  - Students can recognize the characteristics of "predatory" and otherwise unethical publishing modalities and practices and can make informed decisions in an attempt to avoid them.

- Course content**
1. History, development, and purpose of scientific disciplines related to quantitative aspects of scientific and information exchange
    - Scientometrics
    - Bibliometrics
    - Infometrics
  2. Citations as indicators of scientific performance
    - Laws and trends
    - Metrics and derivatives (impact factor, h-index, etc.)
    - Analyzes, differences between scientific fields and normalization
  3. Usage metrics and altmetrics
  4. Databases of scientific journals, indexing and ranking
    - Scopus
    - WoS
    - Google Scholar
    - Scientific indexes (SCI-E, SSCI, A & HCI, CPCI, ESCI, etc.)

- JCR and SJR
  - Global and regional practices for ranking articles, journals, researchers, institutions, and countries
5. Publishing models of scientific journals
- Subscription model
  - Open access models (gold, platinum, green, etc.)
6. Unethical publication and scientific misconduct
- "Predatory" magazines and publishers
  - "Fake" and "hijacked" magazines
  - Abuse and corruption in the review process
  - Potentially illegitimate metrics and journal services
  - Retractions

#### Teaching methods

Lectures. Consultative teaching. Tutorials for using online magazine services and tools.

#### Books and other learning materials

- Beall, J. (2012). Predatory publishers are corrupting open access. *Nature News*, 489(7415), 179.
- Beall, J. (2016). Essential information about predatory publishers and journals. *International Higher Education*, 86, 2-3.
- Cobey, K. D., Lalu, M. M., Skidmore, B., Ahmadzai, N., Grudniewicz, A., & Moher, D. (2018). What is a predatory journal? A scoping review. *F1000Research*, 7, 1-29. <https://doi.org/10.12688/f1000research.15256.2>
- Dadkhah, M., Maliszewski, T., & Jazi, M. D. (2016). Characteristics of hijacked journals and predatory publishers: Our observations in the academic world. *Trends in Pharmacological Sciences*, 37(6), 415-418.
- De Bellis, N. (2009). *Bibliometrics and citation analysis: From the science citation index to cybermetrics*. Scarecrow Press.
- Gingras, Y. (2016). *Bibliometrics and research evaluation: Uses and abuses*. MIT Press.
- Laine, C., & Winker, M. A. (2017). Identifying predatory or pseudo-journals. *Biochemia Medica*, 27(2), 285-291.
- Masten, Y. B., & Ashcraft, A. S. (2016). The dark side of dissemination: Traditional and open access versus predatory journals. *Nursing Education Perspectives*, 37(5), 275-277.
- Mingers, J., & Leydesdorff, L. (2015). A review of theory and practice in scientometrics. *European Journal of Operational Research*, 246(1), 1-19.
- Roemer, R. C., & Borchardt, R. (2015). *Meaningful metrics: A 21st-century librarian's guide to bibliometrics, altmetrics, and research impact*. American Library Association.
- Shen, C., & Björk, B. C. (2015). 'Predatory' open access: A longitudinal study of article volumes and market characteristics. *BMC Medicine*, 13(1), 230-245.
- Tahamtan, I., Afshar, A. S., & Ahamdzadeh, K. (2016). Factors affecting number of citations: A comprehensive review of the literature. *Scientometrics*, 107(3), 1195-1225.

#### Course activities and grading method

Practical work	20		
Research work	20	Final exam	60

#### Additional course notes

Name of the teacher who prepared this form | Siniša Subotić