SYLLABUS

1. Information regarding the program

1.1 Higher education institution	Babeş-Bolyai University
1.2 Faculty	Faculty of Physics
1.3 Department	Doctoral School of Physics
1.4 Field of study	Physics
1.5 Study cycle	Doctorate
1.6 Study program / Qualification	Doctoral training/PhD in Physics

2. Course data

2.1 Name of discipline			General research methods and methodology of scientific writing				
2.2 Teacher responsible for lectures			Prof. dr. Simion Aştilean, Prof. dr. Neda Zoltan, Prof. dr. Radu Fechete, Prof. dr. Coriolan Tiuşan				
2.3 Teacher responsible for seminars			Prof. dr. Simion Aştilean, Prof. dr. Neda Zoltan, Prof. dr. Radu Fechete, Prof. dr. Coriolan Tiuşan				
2.4 Year of study	I	**2.5 Semester**	I	**2.6 Type of evaluation**	Exam	**2.7 Course framework**	DO

3. Estimated total time of teaching activities (hours per semester)

3.1 Hours per week	1.5	Out of which: 3.2 Lectures	1	3.3 Seminars / Laboratory classes	0.5
3.4 Total hours in the curriculum	36	Out of which: 3.5 Lectures	12	3.6 Seminars / Laboratory classes	6
Allocation of study time:					**42**
Study supported by textbooks, other course materials, recommended bibliography and personal student notes					14
Additional learning activities in the library, on specialized online platforms and in the field					6
Preparation of seminars/laboratory classes, topics, papers, portfolios and essays					10
Tutoring					8
Examinations					4
Other activities: -					–

3.9 Total individual study hours	42
3.10 Total hours per semester	60
3.11 Number of ECTS credits	5

4. Prerequisites (if necessary)

4.1 Curriculum	
4.2 Competences	

5. Conditions (where applicable)

5.1 Conducting lectures	Course hall, appropriate board, projector, internet connexion. For online teaching specific platforms: MsTeams, Zoom, Skype will be used.

5.2 Conducting seminars/laboratory classes	Course hall, appropriate board, projector, internet connexion. For online teaching specific platforms: MsTeams, Zoom, Skype will be used.

6. Specific competences acquired

Professional competences	1. Knowledge of scientific research methodologies. 2. Knowledge of methodologies for writing scientific papers. 3. Knowledge of the major implications of ethics in scientific research. 4. Ability to communicate scientific ideas.
Transversal competencies	1. Ability to use scientific research methodologies in other related fields. 2. Using methodologies for developing scientific papers in new contexts. 3. Use of knowledge in debates on current issues of ethics and academic integrity.

7. Course objectives (based on the acquired competencies grid)

7.1 The general objective of the discipline	1. Knowledge and assimilation of scientific research methodologies and elaboration of scientific papers in the specific area of Physics. 2. Development of critical thinking, scientific communication skills, logical argumentation, and cross-disciplinary thinking
7.2 Specific objectives	- To know the specific aspects of scientific research activities in the field of Physics. - To know the stages of elaboration and development of some scientific research activities. - To know the main Scientometric indicators and to know how to access the main databases of the scientific literature. - To strengthen the ethical responsibility of doctoral students. - To know and assimilate the methodology of elaborating scientific papers (thesis, memoirs, papers, oral presentations, posters). - To know and assimilate the methodology of elaborating scientific research projects. - To assimilate competences regarding the rigorous, clear and attractive graphic presentation of the research results (scientific dissemination issues). - To contribute to the broadening of the horizon of knowledge and scientific culture of doctoral students.

8. Content

8.1 Lectures	**Teaching methods**	**Comments**
Introduction to the field of Scientometry. Scientometric indicators. Impact factor. Hirsch Index. Other classifications.	Frontal lecture	2 hours
Accessing specific databases of scientific literature and bibliographic resources (En-formation, Scopus, ISI Web of Knowledge, etc.)	Frontal lecture Case studies	2 hours
Methodology of scientific articles writing (scientific writing): the structure and content of the manuscript, the ethics of the co-author, the Acknowledgements, the Cover Letter, the different stages of publishing and revising a scientific article.	Frontal lecture Problematisation. Case study.	2 hours
Strategies for publishing in top journals, the open-access journal policy, use of graphic illustrations, graphical / video-abstract, popularization and visibility of published articles.	Frontal lecture Problematisation. Case study.	2 hours
Specific issues of scientific research in the field of Physics. Defining and developing an original and relevant research topic in Physics.	Frontal lecture Problematisation. Case study.	2 hours
General methodology of writing a research project. Content: novelty, context, impact, structure, description, implementation, risk factors. Scientific research methods and implementation in a Ph.D. Thesis. Structure and content of a Ph.D. thesis manuscript. Methodologies for processing and graphical presentation of results in a doctoral thesis.	Frontal lecture Problematisation. Case study.	2 hours
Bibliography 1. David B. Resnik: *The Ethics of Science: An Introduction*, Philosphical Issues in Science (Routledge, 1998) 2. Michael Alley: *The Craft of Scientific Writing* (3rd Edition, Springer, 1998). 3. Science Rules: *A Historical Introduction to Scientific Methods*, Ed. Peter Achinstein, (Johns Hopkins University Press, 2004). 4. Writing Science: *How to Write Papers That Get Cited and Proposals That Get Funded*, (Oxford University Press; 1 edition, 2011). 5. Kerans ME, de Jager M. 2010. Handling plagiarism at the editor's desk. *European Science Editing* 36(3): 62-66. http://www.ease.org.uk/sites/default/files/ese_aug10.pdf 6. Bernhard Blümich, *NMR Imaging Of Materials* (Oxford University Press, 2013.		
8.2 Seminars / laboratory classes	**Teaching methods**	**Comments**
Critical aspects regarding the inflation of irrelevant scientific production, the inflation of irrelevant scientific publications, ethical issues in scientific publications.	Case study. Debates.	2 h
Methods of disseminating research results in the scientific community and in society (publications, workshops, web pages)	Debates	2 h
Case study: Elements of complex scientific graphics in two- and three-dimensional format Case study: Presentation of the development of a topical research field	Case study	2 h
Bibliography		

1. David B. Resnik: *The Ethics of Science: An Introduction*, Philosphical Issues in Science (Routledge, 1998)
2. Michael Alley: *The Craft of Scientific Writing* (3rd Edition, Springer, 1998).
3. Science Rules: *A Historical Introduction to Scientific Methods*, Ed. Peter Achinstein, (Johns Hopkins University Press, 2004).
4. Writing Science: *How to Write Papers That Get Cited and Proposals That Get Funded*, (Oxford University Press; 1 edition, 2011).
5. Kerans ME, de Jager M. 2010. Handling plagiarism at the editor's desk. *European Science Editing* 36(3): 62-66, http://www.ease.org.uk/sites/default/files/ese_aug10.pdf
6. Bernhard Blümich, *NMR Imaging Of Materials* (Oxford University Press, 2013,

9. Aligning the contents of the discipline with the expectations of the epistemic community, representatives, professional associations and standard employers operating in the program field

The content of the course is similar to the ones from other Western and Romanian universities.
The course content intends to endeavor the students with specific skills that meet employment request in research institutions, universities, professional associations, etc: (i) deep knowledge of research methodology in Physics area and related fields, (ii) ability to access the scientific information using specific databases, (iii) perform methodologic analysis and develop critical thinking, (iv) develop the ability to write scientific papers, generate innovative ideas and find transdisciplinary solutions.

10. Examination

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Weight in the final grade
10.4 Lectures	Assessment of knowledge	Written exam (report)	75%
10.5 Seminars / laboratory classes	Activity during seminars	Discussions, answers to questions	30%
10.6 Minimum performance standard			
Correct assessment of methods and models to be used to solve a particular problem. Proper use of computational techniques and available hardware and software resources.			

Signature of course coordinator	Signature of seminar coordinator
Prof. dr. Simion Aştilean	Prof. dr. Simion Aştilean
Prof. dr. Neda Zoltan	Prof. dr. Neda Zoltan
Prof. dr. Coriolan Tiuşan	Prof. dr. Coriolan Tiuşan
Prof. dr. Radu Fechete	Prof. dr. Radu Fechete

Date	Signature Head of department
21.09.2024	Prof. dr. Vasile Chiş