SYLLABUS

1. Information regarding the programme

1.1 Higher education institution	Babes-Bolyai University
1.2 Faculty	Physics
1.3 Department	Doctoral School of Physics
1.4 Field of study	Physics
1.5 Study cycle	Doctorate
1.6 Study programme / Qualification	Physics

2. Information regarding the discipline

2.1 Name of the discipline			*General research methods and methodology of scientific writing*				
2.2 Course coordinator			Prof dr Simion Aştilean, Prof dr Neda Zoltan, Prof dr Radu Fechete, Prof dr Coriolan Tiuşan				
2.3 Seminar coordinator			Prof dr Simion Aştilean, Prof dr Neda Zoltan, Prof dr Radu Fechete, Prof dr Coriolan Tiuşan				
2.4 Laboratory coordinator							
2.5 Year of study	I	**2.6 Semester**	I	**2.7 Type of evaluation**	Exam	**2.8 Type of discipline**	DO

3. Total estimated time (hours/semester of didactic activities))

3.1 Hours per week	1.5	**From which:**			
3.2 course	1	**3.3 seminary**	0.5	**3.4 laboratory**	
3.5 Total hours in the curriculum	18	**From which:**			
3.6 curs	12	**3.7 seminary**	6	**3.8 laboratory**	

Time allotment:	**hours**
Learning using manual, course support, bibliography, course notes	21
Additional documentation (in libraries, on electronic platforms, field documentation)	10
Preparation for seminars/labs, homework, papers, portfolios, and essays	10
Tutorship	12
Evaluations	5
Other activities:	–

3.9 Total individual study hours	**55**
3.10 Total hours per semester	**76**
3.11 Number of ECTS credits	**5**

4. Prerequisites (if necessary)

4.1 curriculum	
4.2 competencies	

5. Conditions (if necessary)

5.1 for the course	Classroom equipped with blackboard and projector, internet connexion. For online teaching specific platforms: MsTeams, Zoom, Skype will be used.
5.2 for the seminar	Classroom equipped with blackboard and projector, internet connexion. For

activities	online teaching specific platforms: MsTeams, Zoom, Skype will be used.
5.3 for the lab activities	-

6. Specific competencies acquired

Professional competencies	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. Objectives of the discipline (outcome of the acquired competencies)

7.1 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 objective of the discipline	- 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 Course	**Teaching methods**	**Remarks** (no. hours)
Introduction to the field of Scientometry. Scientometric indicators. Impact factor. Hirsch Index. Other classifications.	Frontal lecture	2 h
Accessing specific databases of scientific literature and bibliographic resources (En-formation, Scopus, ISI Web of Knowledge, etc.)	Frontal lecture Case studies	2 h

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 h
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 h
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 h
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.	Frontal lecture Problematisation. Case study.	2 h
Methodologies for processing and graphical presentation of results in a doctoral thesis.	Frontal lecture Problematisation. Case study.	2 h
Total		**14 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,

8.2 Seminary	**Teaching methods**	**Remarks** (no hours)
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	2 h
Case study: Presentation of the development of a topical research field	Case study	1 h
Total		**7 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,

8.3 Laboratory	**Teaching methods**	**Remarks**

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations, and representative employers within the field of the program

The content of the course is similar to the ones from other Western and Romanian universities.
The course content intends to endeavour 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. Evaluation

Type of activity	**10.1 Evaluation criteria**	**10.2 Evaluation methods**	**10.3 Share in the grade (%)**
10.4 Curs	knowledge and understanding of concepts	Exam	75%
10.5 Seminar	Activity	Oral presentation	25%
10.6 Laboratory	Activity		
10.7 Minimum performance standards			
Knowledge of 60% from the content of the course			

Signature of course coordinator	Signature of the seminary coordinator	Signature of the lab coordinator
Prof dr Simion Aştilean Prof dr Neda Zoltan Prof dr Coriolan Tiuşan Prof dr Radu Fechete	Prof dr Simion Aştilean Prof dr Neda Zoltan Prof dr Coriolan Tiuşan Prof dr Radu Fechete	
Date: 21/09/2020	Date of approval: 21/09/2020	Signature of the Head of the Doctoral School Prof dr Simion Aştilean