

SYLLABUS

1. Information regarding the programme

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|--|----------------------------|
| 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

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|-----------------------------------|---|---------------------|---|-------------------------------|------|-------------------------------|----|
| 2.1 Name of the discipline | <i>General research methods and methodology of scientific writing</i> | | | | | | |
| 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)

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|----------------------------|--|
| 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

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|----------------------------------|---|
| Professional competencies | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ul style="list-style-type: none"> - 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 |

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|---|---|-------------|
| 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*, Philosophical 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*, Philosophical 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 |
|----------------|------------------|---------|
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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 Aştorean
 Prof. dr. Neda Zoltan
 Prof. dr. Coriolan Tiuşan
 Prof. dr. Radu Fechet

Prof. dr Simion Aştorean
 Prof. dr. Neda Zoltan
 Prof. dr. Coriolan Tiuşan
 Prof. dr. Radu Fechet

Date:

21/09/2020

Date of approval:

21/09/2020

Signature of the Head of the Doctoral School

Prof. dr. Simion Aştorean