METHODOLOGY OF SCIENTIFIC RESEARCH

1. Course/Module Information

Faculty	Computers, Informatics, and Microelectronics
Department	Informatics and Systems Engineering
Study Cycle	Cycle II, Master's Degree Studies
Study Program	**Data Science**

Year of Study	Semester	Type of assessment	Formative category	Optionality Category	ECTS Credit
1st Year *(full-time education)*	I	E	F – Fundamental Course Unit	O - Mandatory Course Unit	5

2. Estimated total time

Total hours in the Curriculum	Including				
	Contact hours		Individual work		
	Lecture	**Laboratory /seminar**	**Year project**	**Theoretical material study**	**Application preparation**
Full-time Education	20	20	-	55	55

3. Prerequisites for Access to the Course/Module

According to the Curriculum	Project Management, Communication and Academic Writing, Philosophy and Critical Thinking, and Intellectual Property Law.
According to Competencies	Students must know the specifics of scientific methodology, including the differences between various methodological orientations and practices developed in science.

4. Conditions for conducting the educational process

Lecture	A blackboard, chalk, projector, and computer are required to present theoretical material in the lecture hall. Student lateness, laptop use, and phone conversations during the lecture will not be tolerated.
Practical work	A blackboard, chalk, and computers are required to conduct practical sessions/seminars. Student lateness and phone conversations during the session will not be tolerated.

5. Specific competencies acquired

Professional Competencies	**CPM 2.** Monitoring technological trends. Innovation. Sustainable development.. **CPM3** Application development. Component integration. Systems engineering. **CPM4** Staff development.
Transversal Competencies	**CT 2.** Social interaction. **CT 3.** Personal and professional development.

6. Course/Module objectives

General objective	Conveying a system of scientific knowledge about research methodology in general and the methodology of science in particular, aiming at mastering the specific language of methodology and becoming familiar with the approach of concrete methodological research.
Specific objectives	• distinguishing the specifics of the methodology of science, including various orientations and methodological practices developed in science; • associating the content of the basic concepts of research design with a view to applying them in contexts predefined by the instructor as well as those created independently; • developing a scientific article.

7. Course/Module content

Syllabus of teaching activities	Number of hours full-time education
Syllabus of lecture activities	
Topic 1. Introduction. Training Objectives within the Course. Science: Characteristics and Current Trends. The Framework Program of the European Union for Research and Innovation - Horizon 2020. The European Union Funding Program for Research and Innovation for the period 2021-2027.	**4**
Topic 2. Positioning of the RM after Investments in Research-development-innovation. The number, dynamics, and quality of publications at the regional and global levels. Dynamics of publications indexed in Web of Science, SCOPUS, and other databases.	**4**
Topic 3. Research classification according to the type of activity. Pure fundamental research. Strategic fundamental research. Applied research. Experimental development.	**4**
Topic 4. Project Management. Classification of projects based on the Organization. Processes within a project. Project planning. The project life cycle. Principles of project management.	**4**
Topic 5. Scientific Publications and Academic Writing. What is a scientific article? The purpose of publication. Types of articles. Structure of a scientific article. What is a poster? Objectives of a poster. Essential elements of a poster presentation. What is a patent? Key elements of a patent.	**4**
Total Lecture Hours:	**20**
Syllabus of seminar/practical work activities	
Topic 1. Strategic Directions of Research-Development in the RM. Funding for Research, Development, and Innovation in the Republic of Moldova.	**4**
Topic 2. Characteristics of Scientific Research. The Role of the National Agency for Research and Development.	**4**
Topic 3. Selecting the topic for a project. Selecting Data for an Article.	**4**
Topic 4. Description of Data for an Article. Developing a scientific article, a poster, and a patent.	**4**
Topic 5. Submission of an Article, Patent, etc. Review, rejection, and acceptance procedures.	**4**
Total Practical Work Hours:	**20**

8. Using generative AI

Permission to use	The use of generative AI in assignments and projects is permitted, provided that students adhere to the following rules: • Generative AI may be used to generate ideas, text structures, or code, but all generated materials must be reviewed and adjusted by the student to ensure that they meet academic requirements. • Any use of generative AI must be declared in the appendix section of each paper, using the phrase: "During the preparation of this paper, the author used [NAME OF TOOL / SERVICE] for the purpose of [REASON]. After using this tool / service, the author reviewed and edited the content as necessary and assumes full responsibility for the content of the paper."
Restrictions to use	Students ***MUSTN'T consider generative AI as a reliable source of information***, as it does not provide clear references or documented sources. • ***Direct citation of AI-generated content*** in academic papers as if it were a primary source ***isn't permitted.*** • Activities in which the use of **generative AI is prohibited** are specified by the teacher and are usually ***intermediate and final assessments*** or that don't involve professional competence development activities.

9. Bibliographic References

Main	1. Mihaela St. Radulescu. Metodologia Cercetării Științifice. Editura Didactica și Pedagogica, 2011.

2. Andronescu C. Şerban – Tehnica scrierii academice, Editura Fundaţiei România de mâine, Bucureşti, 1997.
3. Constantinescu, N.N., Probleme ale metodologiei de cercetare în ştiinţa economică, Editura Economică, Bucureşti, 1998.
4. Dinu Vasile, Săvoiu Gh., Dabija Dan Cristian, A concepe, a redacta şi a publica un articol ştiinţific, Editura ASE, Bucureşti, 2016
5. Gavrilescu Maria, Strategia elaborării lucrărilor ştiinţifice publicabile în reviste ştiinţifice internaţionale (incluse în baze de date şi WEB of Science).
6. Mihai N. Introducere în metodologia şi filosofia ştiinţei. Chişinău: Editura ARC,1997.

Supplementary	1. Ţapoc Vasile. Teoria şi metodologia ştiinţei contemporane: Concepte şi interpretări Chişinău, Editura CEP USM, 2005. 2. C. George Thomas. Research Methodology and Scientific Writing. Springer Cham, 2021. ISBN978-3-030-64864-0. https://doi.org/10.1007/978-3-030-64865-7 3. Alya Omar Almutairi. Scientific Research Methods. IISTE (April 11, 2017). ISBN-10: 1622659392, ISBN-13: 978-1622659395.

10. Evaluation

Periodic		Current evaluation	Individual study	Project/thesis	Examination
Mid term 1	Mid term 2				
Full-time education					
15%	15%	15%	15%	-	40%

11. Evaluation criteria

Activity	Evaluation components	Evaluation method, evaluation criteria	Weight in final grade for the Activity	Weight in course evaluation
Full-time education				
Mid term I	Theoretical content, topics 1-3	Test	100%	**15%**
Mid term II	Theoretical content, topics 4-5	Activities during practical work/seminar	100%	**15%**
Current evaluation	Practical activity	Attendance and participation in classes	50%	**15%**
Individual study	Task 1: Classification of research by activity type	Presentation/Discussion on the topic	50%	**15%**
	Task 2: Developing a scientific article	Article presented for evaluation	50%	
Final examination	Theoretical and practical content	Oral exam. Grading according to grading scale	100%	**40%**