

SYLLABUS
Fall semester 2022-2023 academic years
on the educational programs “M705101-Biology”, “7M05101 -Biology”; “7M05109-Biotechnology”; “7M05104-IT-Genetics”; “7M05105-Genetics”; “7M05110-Food Biotechnology; “7M05114-Virology””

Discipline's code	Discipline's title	Independent work of students (IWS)	No. of hours per week			Number of credits	Independent work of student with teacher (IWST)
			Lectures (L)	Practical training (PT)	Laboratory (Lab)		
OPNI-5206	Organization and Planning of Scientific Research	5	15	30	15	5	7
Academic course information							
Form of education	Type of course	Types of lectures		Types of practical training	Form of final control		
Full-time	MD	Point-by-point, chalk-and-talk, problem - solving, semiformal, lecture-discussion		Problem-solving seminars Case studies	Written		
Lecturer	Suvorova Mariya, PhD						
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Aim of course	Expected Learning Outcomes (LO)* As a result of studying the discipline the undergraduate will be able to:			Indicators of LO achievement (ID) (for each LO at least 2 indicators)			
To familiarize students with the basic principles of organization, design and realization of a scientific research, principles of databases search, literature analysis, preparation of the research papers, posters and oral presentations.	1. Determine principles of literature search and types of citations			1.1. Be able to apply basic principles of complete classification of citation types 1.2. Find specific characteristics for each of the citation types widely used			
	2. Analyse appropriate type of citation while writing an abstract, paper or manuscript			2.1. Be able to design complete description of citation features 2.2. Have skills to determine differences in writing an abstract, paper, or manuscript			
	3. Analyse the quality of the abstract, poster, paper or report			3.1. Be able to apply structural peculiarities of research proceedings (abstract, paper, or manuscript) 3.2. Have skills to target the audience and functions of these research proceedings (abstract, paper, or manuscript)			
	4. Elucidate proper methods of conducting correct experimental work, interviewing, forming research teams, designing research proceedings (abstracts, papers, reports, graduate theses, and grant proposals)			4.1. Be able to develop strategy to application of various research method and proceedings (abstracts, papers, reports, graduate theses, and grant proposals) 4.2. Be able to shape up research teams through a range of interviewing tools and questions			

	5. Summarize and make analysis on modern techniques of scientific reasoning while holding or taking part in symposia and workshops, streaming research videos, making experimental procedures in teams, setting up editorial boards	5.1 Have skills of implying a number of scientific reasoning approaches to holding online and offline scientific gatherings, streaming research videos, conducting experiments in teams 5.2. Be able to plan the roles of forum's chair person, attendant, volunteer, member of editorials and paper submitter
Prerequisites	Scientific Writing; Genetics, Cell Biology, Molecular Biology, Biochemistry, and etc. courses of B.Sc. studies in Biology, Biotechnology, Genetics, and related curriculae	
Post requisites	Master's thesis	
Information resources	<p>Literature:**</p> <ol style="list-style-type: none"> 1. Vaughn L. Concise Guide to Critical Thinking. 2-nd Edition, 2020, 368 pp. 2 Morrow D.R., Weston A. A Workbook for Arguments: A Complete Course in Critical Thinking 3-rd Edition, 2019, 563 pp. 3 Golard A. A field guide to thinking errors: Using neuroscience to classify, avoid, and exploit our biases. 2021, 260 pp. 4 Potochnik, A., Colombo M., Wright C. Recipes for Science, Taylor&Francis, 2019, 327 pp. 5 Meltzoff, J. and H. Cooper. Critical Thinking about Research (2-nd editon).APA (Amazon Kindle), 2018, 335 pp. 6 Rurherford, A. Critical thinkers:methods for clear thinking and analysis in everyday situations from the greatest thinkers in history. Amazon (Great of Kindle Edition), 2018, 173 pp. 7 Aytasheva Z.G. Concise Guidance for Biologists: Preparation of Scientific Publications and Grant Proposals. Kazakh University, 2005, 47 p. (Rus.). and later editions of this guidebook. 8 Dawkins R. The Oxford book of modern writing. 1st paper edition. Oxford University Press, 2009, 419 pp. <p>Internet resources:</p> <ol style="list-style-type: none"> 1. http://elibrary.kaznu.kz/ru 2. http://highered.mcgraw-hill.com/sites/0767417399/student_view0/chapter1/web_links.html 3. http://wps.ablongman.com/long_aaron_lbb_2/22/5789/1482143.cw/index.html 4. http://college.cengage.com/english/chaffee/critical_thinking/2e/students/links/chap10.html 5. http://bmj.bmjournals.com/collections/read.htm (how to read scientific papers) 6. http://modeling.asu.edu/modeling/weblinks.html (weblink for the modelers) 7. https://uk.pcmag.com/video-conferencing-software/141537/15-tips-to-make-meetings-more-accessible-for-everyone 8. https://opportunitiescorners.info/how-to-write-a-research-proposal-for-masters-and-phd/ 	
Academic policy of the course in the context of university moral and ethical values	<p>Academic Behavior Rules: All students are required to register for the MOOC. The deadlines for completing the modules of the online course must be strictly observed in accordance with the schedule for studying the discipline. Leave in case of current MOOC or SPOC courses. ATTENTION! Failure to meet deadlines results in loss of points! The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the training course, as well as in the MOOC. Leave in case of current MOOC or SPOC courses.</p> <p>Academic values:</p> <ul style="list-style-type: none"> - Practical trainings/laboratories, IWS should be independent, creative. - Plagiarism, forgery, cheating at all stages of control are unacceptable. - Students with disabilities can receive counseling at e-mail *****@gmail.com. 	
Evaluation and attestation policy	<p>Criteria-based evaluation: assessment of learning outcomes in relation to descriptors (verification of the formation of competencies in midterm control and exams).</p> <p>Summative evaluation: assessment of work activity in an audience (at a webinar); assessment of the completed task.</p>	

CALENDAR (SCHEDULE) THE IMPLEMENTATION OF THE COURSE CONTENT:

week	Topic name	Number of hours	Max. score
Module 1. Principles of a research design			
1	Lec.1 Introduction. Philosophical backgrounds, modes and techniques of scientific reasoning.	1	
	Sem 1. Syllabus overview, discipline schedule and score	2	3
	Lab 1. Design of a scientific research – an overview.	1	4
2	Lec 2. Scientific methodology – scientific experiment	1	
	Sem 2. Designing experimental research	2	3
	Lab 2. Analysis of an experimental research papers	1	4
2	IWST 1. Consultation on work with literature sources, databases and online resources		
3	Lec 3. Scientific methodology – field researches	1	
	Sem 3. Designing field researches	2	3
	Lab 3. Analysis of a research papers based on field works	1	4
3	IWST 2. Consultation on the implementation of IWM1		
4	Lec 4. Scientific research - data analysis and presentation. Part 1	1	
	Sem 4. Statistical data analysis and graphical representation	2	3
	Lab 4. Data presentation and analysis as in a given research paper.	1	4
4	IWM 1. Written essay as argued, scientifically based opinion, 7000 - 40000 characters spaces included, on theme: “Best experimental research on my specialization”		26
5	Lec 5. Scientific research - data analysis and presentation. Part 2	1	
	Sem 5. Case study - statistical analysis of a given data	2	3
	Lab 5. Case study – graphical presentation and analysis of a given data	1	4
	IWST 3. Consultation on the implementation of the IWM 2.		
Module 2. Research proceedings and their compilation			
6	Lec 6. Literature search. Library and online search	1	
	Sem 6. Online research databases – Web of Science, PubMed, Scopus, Research Gate etc.	2	3
	Lab 6. Rules and tips for using online research databases	1	4
6	IWM 2. Written essay as argued, scientifically based opinion, 7000 - 40000 characters spaces included, on theme: “Analyzing my theme actuality using online research databases”		25
7	Lec 7. Types of research publications. Reviews, experimental papers, short communications, letters to the editor, abstracts, synopses, highlights.	1	3
	Sem 7. Differences between experimental papers and short communications	2	4
	Lab 7. Structure of a research paper	1	
7	LEVEL CONTROL 1		100
8	Lec 8. Scientific paper as one of the main grounds for the development of scientific reasoning skills	1	
8	Sem 8. Main mistakes in drafting the paper.	2	3
8	Lab 8. Communication with the editorial board while submitting a paper	1	4
8	IWST 4. Consultation on the implementation of the IWM 3.		
9	Lec 9. Poster presentations. History of the poster.	1	
9	Sem 9. Designing a poster on a given issue	2	3

9	Lab 9. Presenting a poster on a given issue.	1	4
	IWM 3. Written essay as argued, scientifically based opinion, 7000 - 40000 characters spaces included, on theme: “Design of my research work”		26
	Module 3 Orals , interviewing and perspectives		
10	Lec 10. Art of oral presentations.	1	
10	Sem 10. Preparation of a thesis presentation.	2	3
10	Lab 10. Presenting a scientific research.	1	4
10	IWST 4. Consultation on the implementation of the IWM 4.		
11	Lec 11. Conferences abstracts and materials	1	
11	Sem 11. Preparing an abstract for a conference	2	3
11	Lab 11. Tips and rules of preparing an abstract for a conference	1	4
12	Lec 12 Discussions during conferences and other oral events	1	
12	Sem 12. Presentation at the conference	2	3
12	Lab 12. Presentation of a work at the conference	1	4
12	IWST 5. Consultation on the implementation of the IWM 4.		
13	Lec 13. Issues of Interviewing	1	
13	Sem 13. Behaviour tactics while getting interviewed	2	3
13	Lab 13. Designing Ten Rules for Masters for successful accomplishment of the studies	1	4
13	IWS 4. Written essay as argued, scientifically based opinion, 7000 - 40000 characters spaces included, on theme: “Abstract of my bachelor thesis”		25
14	Lec 14. Online learning and commercialization of scientific research	1	
14	Sem 14. Compiling lists of online learning networks and commercialization web links for future master studies	2	3
14	Lab 14. Ten Rules principles in scientific reasoning Theme	1	4
	IWST 6. Colloquium - situational task		
15	Lec 15. Life-long learning. Perspectives and constraints of scientific development	1	
15.	Sem 15. Perspectives and constraints of scientific development.	2	3
15	Lab 15. Checking questions to lectures 8-14 (short tests).	1	4
15	IWST 7. Consultation on examination issues		
	LEVEL CONTROL 2		100

Dean _____ B.K. Zayadan
Head of Department _____ Zh.K. Zhunusbayeva
Lecturer _____ M.A. Suvorova