Attachment No. 3		Course program for the first cycle of studies			
1.	Course title	Introduction in scientific research			
2.	Code	DMMSR6			
3.	Study program	Dentistry - integrated first and second cycle of studies			
4.	Organizer of the study program (unit, i.e., institute, department, division)	UKIM - Faculty of Dentistry, Department of Oral and Periodontal Diseases			
5.	Degree (first, second, third cycle)	Integrated First and Second Cycle Studies			
6.	Academic year/semester	Year	6	semester	11
7	Course workload expressed in ECTS credits	2			
8.	Teacher (in case of multiple teachers, designated teacher in charge)	Prof. Dr. Snezhana Peshevska			
9.	Language in which the curriculum is	English			

	conducted	
10.	Necessary prerequisites for taking and passing the course	Completed all compulsory subjects from the fifth year and passed all compulsory subjects from the fourth year.
11.	Course objectives (competences) and learning outcomes:	Students will be introduced to science in modern society, the importance of scientific research and the principles of scientific methods. By mastering the parts of the research process, through critical analysis of data sources, they will also learn about respecting the principles of evidence-based medicine and its application. By adopting the procedures and rules for the preparation, publication and presentation of the results of scientific research, they will clarify research ethics, teamwork and the meaning of authorship. Students will develop practical skills for planning and carrying out research projects that will result in scientific, scientific-professional and professional works.
12.	Detailed course content by chapters and units with learning outcomes for each chapter	Theoretical instruction - lectures Chapter 1 - Basic guidelines for scientific research, with a focus on planning and methodology of research using biomedical databases Introduction to scientific research (definition of scientific work, terminology in science, types of evidence, strength of recommendations), types of medical research, importance of evidence in medicine.....1 class Research planning (formulation of hypothesis and goal, selection of design of scientific research study)……1 class Research methodology (Observational Studies): Descriptive Studies, Analytical Studies: Cross-sectional Studies, Cohort Studies, Case-Control Studies; Experimental Studies: Randomized Controlled Trials – RCT, Clinical Trials, Field and Community Trials; Ecological Studies; Systematic Reviews and Meta-Analyses……2 classes Data collection and processing (use of biomedical databases, methods and ethics in data collection, evidence-based medicine and its use, database creation)…1 class Statistical analysis (basic statistical methods, interpretation of results and errors in analysis)…1 class Outcomes from chapter 1: The students will be introduced to scientific work, focusing on the types of medical research, through planning the choice of methodology, rules and principles for data collection, processing and statistical analysis. 2. Chapter - Writing and publishing scientific papers respecting the ethical principles in scientific work Ethics in scientific work (principles of good clinical practice, informed consent, conflicts of interest, responsible behavior in science, plagiarism and use of artificial intelligence in science) .....1 class Writing and publishing scientific papers (structure of a scientific paper: title, abstract, keywords, introduction and purpose, literature review, material and methods, results, discussion, conclusions and references, preparation of a manuscript for publication and the review process and response to reviewers' comments) .....4 classes Critical reading of literature (assessment of the studies quality, systematic reviews and meta-analyses) .....1 class Projects, management and funding (submission of projects: teamwork and time organization, sources of funding and budget planning) .....1 class Examples of proper scientific research (analysis of specific scientific research works - abstracts, poster presentations, original papers, review papers, case reports, therapeutic notes, special papers, letters to the editor, with critical assessment and guidelines for a possible solution to the research problem .....2 classes Outcomes from chapter 2: The students will learn about respecting ethics in scientific work when writing and publishing scientific papers, as well as the need for critical analysis of the literature, through examples of correct scientific works. Taking advantage of the opportunity to submit projects and the method of preparation closes this chapter. Total: .....15 classes Exercises Exercise 1 - Defining a topic for scientific research, searching medical databases by keywords, setting hypotheses and research questions. Systematic literature review using PubMed/MEDLINE with filters for clinical studies, as well as assessing the quality of sources

		(e.g. PRISMA checklists)...1 class Exercise 2 - Ethics in scientific research as a postulate of respecting the principles of the Helsinki Declaration, the necessity of informed consent and data protection, through ethical dilemmas in clinical trials and the role of ethics committees. The panel discussions will also discuss the conflict of interest, copyright protection, as well as plagiarism and the use of artificial intelligence tools in creating scientific papers, as a source of unethical behavior in science...1 class Exercise 3 - Planning and organizing scientific research on a given topic by setting a research methodology, designing surveys, structured questionnaires, using laboratory research and respecting the principles of precision and validity of the same...3 classes Exercise 4 - Writing a scientific paper with complete structure (title, abstract, introduction with purpose, material and methods, results, discussion, conclusion and appropriate references, with academic precision, clarity and avoiding plagiarism. The exercise can be structured as an analysis of an example of a published paper, or as a task of editing a sample of a "poorly" written paper.....5 classes Exercise 5 - Integration of knowledge - from idea to publication, as preparation for thesis writing. Students present a small research project (e.g., a survey with descriptive statistics, a research assignment, a draft version of the basic components of the thesis, etc.) in 5 minutes...5 classes Total .....15 classes			
13	Interrelation of subjects	Ethics in scientific work, Biostatistics, Epidemiology, Dental health systems, Applied informatics, Legal and ethical aspects of dentistry			
14.	Detailed description of the teaching and working methods for the subject	Interactive instruction, working in small groups, teamwork, panel discussions			
15.	Total available time	60 classes			
16.	Forms of teaching activities	16.1.	Lectures - theoretical teaching classes	15	
		16.2.	Exercises (laboratory, auditorium), seminars, teamwork: classes	15	
		16.3.	Practice: classes		
17.	Other forms of activities	17.1.	Project assignments: classes		
		17.2.	Independent assignments: classes		
		17.3.	Home study - assignments	30	
18	Signature requirements	Absence from at most one exercise and attendance at 60% of lectures			
19	Grading method				
	19.1.	Tests: points		30	
	19.2.	Seminar work/project, written and oral presentation: points		20	
	19.3.	Final exam: points		50	
20	Grading criteria (points/grade)		up to 59 points	5 (five) (F)	
			from 60 to 68 points	6 (six) (E)	
			from 69 to 76 points	7 (seven) (D)	
			from 77 to 84 points	8 (eight) (C)	
			from 85 to 92 points	9 (nine) (B)	
			from 93 to 100 points	10 (ten) (A)	
21.	Method of monitoring the quality of instruction	Self-evaluation by students, control by assistants in carrying out practical instruction and assessment of the students' success, as well as the pass rate of students who have passed the course			
22.	Literature				
	22.1.	Required literature			
		Ord. No.	Author	Title	Publisher	Year

		1.	Prof. Dr. Ljubica Georgievska-Ismail (editor) et al.	Fundamentals of scientific research work: a textbook for medical students and students of professional studies in all health professions	Faculty of Medicine, University "Ss. Cyril and Methodius, Skopje	2021
		2.	Marušić M.	Uvod u znanstveni rad u medicine. 6th ed.	Medicinskana klada, Zagreb	2019
		3.	Boniface DR	Research Methods in Medicine & Health Sciences	Cham: Springer	2020
	22.2.	Additional Literature				
		Ord. No.	Ord. No.	Ord. No.	Ord. No.	Ord. No.
		1.	Hall GM	How to Write a Paper. 6th ed.	Boca Raton: CRC Press	2019
		2.	Innes NPT, Clarkson JE	Guide to Research Methods in Dentistry	Hoboken: Wiley-Blackwell	2016
		3.	Greenhalgh, T.	How to Read a Paper: The Basics of Evidence-Based Medicine (6th ed.).	Wiley-Blackwell	2019