Attachment No. 3		Course program for the first cycle of studies			
1.	Course title	Regenerative dentistry			
2.	Code	DMERD6			
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 Implantology and 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. Daniela Veleska-Stevkovska (Teacher in charge), Prof. Dr. Marija Peeva Petreska, Prof. Dr. Aneta Atanasovska			
9.	Language in which the curriculum is conducted	English			
10.	Necessary prerequisites for taking and passing the course	None			
11.	Course objectives (competences) and learning outcomes:	The main objective of the elective course Regenerative dentistry is to provide students in the first cycle of integrated studies with a detailed overview of contemporary scientific information on the materials and			

		methods used in regenerative dentistry.		
12.	Detailed course content by chapters and units with learning outcomes for each chapter	1. Chapter - Stem cells and autologous grafts -Introduction to regenerative dentistry, biological foundations, classification, and characteristics of graft materials 1 class - Principles and techniques of bone augmentation and regeneration (guided bone regeneration GBR) 1 class - Overview of barrier membranes in regenerative dentistry (resorptive, non-resorptive, biological membranes), indications, role of regenerative membranes 1 class - Autologous blood products. First generation platelet-rich plasma and second generation platelet-rich fibrin (introduction to the concept of PRP and PRF) 1 class - Biology of wound healing, biology of PRF composition, special emphasis on growth factors (PDGF, TGF-b, VEGF, insulin-like growth factor, EGF), their cellular origin as well as their biological effects. 1 class -Indications and clinical use of PRF (oral surgery, periodontal surgery, preprosthodontic surgery, implantology, use of PRF in BRONJ, etc.) 1 class -Stem cells – definition, types (adult and embryonic stem cells), isolation and multiplication 1 class -Clinical perspectives and cell-based therapies in regenerative medicine (application of dental stem cells in extraoral and intraoral organs and tissues) 1 class -3D printing in regenerative dentistry: advanced technology in craniofacial regeneration 1 class Outcomes from chapter 1: The students will acquire basic knowledge about the types of regenerative graft materials as well as the biomaterials used for soft tissue augmentation. Students will be informed about the benefits of the clinical use of autologous blood derivatives PRP and PRF in clinical practice. The first chapter will also cover the trend of using biological and conceptual information on stem cells, dental stem cells, and induced pluripotent stem cells, new innovative methods for creating carriers of the regenerative matrix, perspectives in pulp tissue regeneration, as well as acquiring the foundations for three-dimensional printing in dentistry 2. Chapter – Augmentation and regeneration of the soft tissue and periodontal complex -Healing of periodontal wounds Guided tissue regeneration (principles and procedures) 1 class -Periodontal regenerative therapy of deep intraosseous defects (materials and procedures) 1 class -Periodontal regenerative therapy for different stages of furcation involvement of molars (materials and procedures) 1 class -Periodontal regenerative therapy of recessions 1 class -Biological effects of the use of growth factors in Regenerative periodontal surgery. Indications and clinical use of Emdogain 1 class -Gene therapy for periodontal tissue regeneration 1 class Chapter 2 outcomes: The Students learn regarding the complex procedures in augmentation and regeneration of the soft tissue and periodontal complex. Total: .....15 classes		
13	Interrelation of subjects	Interrelation with implantology, oral surgery, periodontology		
14.	Detailed description of the teaching and working methods for the subject	Interactive instruction, laboratory or clinical exercises, working in small groups, presentation and performance of laboratory procedures, demonstration of instruments and methods used, teamwork		
15.	Total available time	60 classes		
16.	Forms of teaching activities	16.1.	Lectures - theoretical teaching classes	15 classes
		16.2.	Exercises (laboratory, auditorium), seminars, teamwork: classes	15 classes
		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 classes
18	Signature requirements			

19	Grading method				
	19.1.	Tests: points			30 points
	19.2.	Seminar paper/project, written and oral presentation: points			10 points
	19.3.	Final exam: points			60 points
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.	Mona K. Marei	Regenerative Dentistry (Synthesis Lectures on Tissue Engineering)	Morgan and Claypool Publishers; 1 editio	2010
		2.	Rachel J. Waddington Prof. Dr., Alastair J. Sloan Prof. Dr.	Tissue Engineering and Regeneration in Dentistry: Current Strategies	John Wiley & Sons, Ltd.	2017
		3.	Platelet Rich Fibrin in Regenerative Dentistry: Biological Background and Clinical Indications	Miron Richard J., Dr., Ph.D., Choukroun, Joseph, M.D.	Blackwell Pub (US)	2017
	22.2.	Additional literature				
		Ord. No.	Author	Title	Publisher	Year
		1.	Jing Wang and YunFeng Lin	Mesenchymal Stem Cells and Craniofacial Regeneration Volume: 1	Bentham Books	2016