Attachment No. 3		Course program for the first cycle of studies
1.	Course title	Dental materials 1
2.	Code	DMMDM1
3.	Study program	Dentistry - integrated first and second cycle of studies
4.	Organizer of the study program (unit, i.e., institute, department, division)	University "Ss. Cyril and Methodius" in Skopje, Faculty of Dentistry - Skopje, Department of Prosthodontic Dentistry

5.	Degree (first, second, third cycle)	Integrated first and second cycle studies			
6.	Academic year/semester	Year	1	Semester	2
7	Course workload expressed in ECTS credits	2			
8.	Teacher	Prof. Dr. Sasho Jovanovski - responsible teacher (teachers and associates from the Department of Prosthodontic Dentistry)			
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:	Introduction to modern dental materials and their application in the dental office and dental laboratory; The student acquires knowledge about the structure, physical and chemical properties of dental materials, and requirements in terms of biocompatibility. Gains competence and knowledge of the proper use and manner of working with the materials.			
12.	Detailed course content by chapter and units, with the learning outcomes for each chapter	Theoretical teaching - lectures 1. Chapter – Introduction to Dental Materials – History, Requirements, Structure and Properties, Division, Biocompatibility History, standards, classification, and requirements of dental materials, biocompatibility, and allergic manifestations caused by dental materials Structure, internal construction, physical and chemical properties of dental materials…… 1 Class Chapter 1 results: The student will become familiar with the different types of dental materials used in the dental practice and dental laboratory; The standards to be met; Physical and chemical properties of the materials; The division according to composition and application, biocompatibility of the materials, and untreated reactions in living organisms 2. Chapter – Introduction to the dental practice and dental materials. Impression-making materials, properties, and classification according to chemical composition and application, impression spoons (factory-made and individual). Impression-making materials, notions, requirements, division, composition, working with impression-making materials, and types of spoons (factory-made and individual). Classification of impression-making materials according to composition and properties (inelastic – thermoplastic, zinc oxide eugenol pastes and waxes, and elastic materials – silicones, polysulfides, and polyethers, hydrocolloids) .....1 class Chapter 2 results: The student will get acquainted with the different types of dental materials used in the dental practice for printing the condition in the mouth, the requirements, the division according to chemical composition and properties, spoons for printing, and the way of working with printed materials (storage, transport, and disinfection). 3. Chapter - Introduction to the modern dental laboratory; Materials used for making models; Gypsum – composition, division, properties and use; Types of dental waxes, physical and chemical properties; Investment material (gypsum as a binding agent, phosphate and silicate as a binding agent); Gypsum – composition, division, requirements, types, preparation, and types of bonding and expansion, models – types (anatomical and working models, duplication models, requirements and fabrication, modern materials and methods for making models, investment and duplication materials.....1 class Dental waxes, notions, classification, requirements, mode of operation, use…….....1 class Results of the third chapter - The student will focus on education for the use of dental plasters and waxes for the preparation of prosthodontic and orthodontic aids. They will get familiar with modern materials and procedures in the digital protocols for fabrication 4. Chapter - Alloys used in dentistry: base metal alloys and precious metal alloys,			

		alloys for metal ceramics, alloys for partial prosthodontics, titanium alloys, dental steels; Alloy processing. Division, properties, characteristics, and structure of metals and alloys, alloying procedures, division, properties, characteristics and structure. Alloys for metal ceramics (base metal alloys and precious metal alloys), Alloys for skeletal prostheses, Titanium alloys……..1 class Results from Chapter 4 – students will be introduced to alloys, the way they are heat treated (melting and stripping), biocompatibility (electro-thermal conductivity, corrosion, blackening), and the castability of metals. 5. Chapter - Polymers - acrylate and composite materials used in prosthodontics and orthodontics, and cements (for temporary and definitive cementing). Polymers - Acrylate materials – structure, chemical composition, physical characteristics, polymerization (types), method of polymerization, processing and use (prostheses and artificial teeth, temporary constructions) .....……..1 class Polymers – Composite materials – structure, chemical composition, physical characteristics, polymerization, processing, and use (faceting materials, temporary constructions, prostheses) ……..1 class Dental cements – chemical composition, properties, division according to composition and method of use Results from chapter 5 – The student will become familiar with the polymer materials used in dentistry, will gain knowledge about the composition and properties, polymerization, and processing 6. Chapter - Ceramic materials in dentistry – types of ceramic materials, division, chemical composition, physical properties, sintering and processing, use of ceramic materials Ceramic materials – composition, properties, division, and use....1 class Ceramic material for metal-ceramics and non-metal ceramics...1 class Results from chapter 6 – The student will become familiar with ceramic materials in dentistry, their composition, division, and application. They will learn about new modern ceramic materials used in the digital CAD-CAM procedure 7. Chapter – Dental materials in oral surgery and implantology; Dental materials in oral surgery (synthetic artificial bone, sutures).....……1 class Dental materials in implantology (metals, polymers, ceramics, separation of materials into bio-tolerant, bioinert and bioactive).....….1 class Results of chapter seven - The student will get acquainted with the materials used in oral surgery and implantology, composition, and manner of work 8. Chapter – Dental materials in maxillofacial surgery – materials for making obturators, facial prostheses, and epithesis Dental materials in maxillofacial surgery. Dental materials for making obturators, facial prostheses, and epithesis……1 class Results from chapter 8 – The student will become familiar with the materials applied in the field of maxillo-facial surgery and the materials for making aids for patients after surgical treatment 9. Chapter – Dental materials in orthodontics Polymers (acrylate, composite, and rubber materials) used in orthodontics .....1 class Metals and alloys used in orthodontics (steel wires, expanders, brackets, bands, rings) .....1 class Results from chapter nine – The student learns about the materials used in orthodontics – acrylate, composite materials, and metals in orthodontics) 10. Chapter - Means and protocols for storage, transport, disinfection, and sterilization of dental materials in the dental office Infection control in dental work – (immunization, barrier, and aseptic techniques). Storage, transport, and disinfection of dental materials (method of performance and composition) .....1 class In the tenth chapter, the student receives knowledge about the control of cross-infections by pathogenic microorganisms in the dental practice and laboratory, and acquires knowledge about the most appropriate way to disinfect dental materials Total: .....15 classes

		Practical classes - Seminars Processing of topics of the respective matter, presentation of the topics by the students, and active involvement of the students in a discussion on the given issue.				
13	Interrelation of subjects	Connection to Biophysics and Medical Chemistry				
14.	Detailed description of the teaching and working methods for the subject	Learning methods: Interactive classes (theoretical), working in small groups (exercises), and other forms provided by the common ECTS criteria Exercises – seminars 15 classes				
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	Attendance at 60% of lectures				
19	Method of grading					
	19.1.	Tests: points		30 points		
	19.2.	Seminar work/project, written and oral presentation: points		10 points		
	19.3.	Final exam: points		60 points		
20	Evaluation 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 teaching	Self-evaluation by students, assistant control during the practical teaching and assessment of the achieved student success, as well as the pass rate of students who have passed the subject				
22.	Literature					
	22.1.	Required literature				
		Ord. number	Author	Title	Publisher	Year
		1.	Kovachevska Gordana, Aneta Mijoska	Dental materials - technical and clinical	Faculty of Dentistry	2019
	22.2.	Additional literature				
		Ord. number	Author	Title	Publisher	Year
		1.	Phillips	Science of dental materials	Elsevier	2003
		2.	Craig's	Restorative dental materials	Elsevier	2008