

		from 93 to 100 points	10 (ten) (A)			
21.	Method of monitoring the quality of teaching	Self-evaluation by students, control of assistants in carrying out practical teaching and assessment of the achieved success of students, as well as the pass rate of students who have passed the course				
22.	Literature					
	22.1.	Compulsory literature				
		Serial number	Author	Title	Publisher	Year
		1.	Evdokija Jankulovska	Anatomy and morphology of jaws and teeth	Faculty of Dentistry - Skopje	2001
		2.	Stenley J. Nelson	Wheeler's Dental Anatomy, Physiology & Occlusion 10 th edition	Elsevier	2015
		3.				
	22.2.	For further reading				
		Serial number	Author	Title	Publisher	Year
		1.	Richne C. Scheid, Gabriela Weis	Woelfel's Dental Anatomy - Eighth edition	Lippincott Williams & Wilkins	2011
		2.				
		3.				

Serial number: 10

Annex No. 3		First cycle study program			
1.	Title of courses	Technology of Dental Materials 2			
2.	Code	PDTMDM1			
3.	Study Program	Professional Dental Technicians			
4.	Organizer of the study program (unit, i.e. institute, department, division)	UKIM - Faculty of Dentistry – Skopje, Department of Dental Prosthetics			
5.	Degree (first, second, third cycle)	First Cycle			
6.	Academic year/semester	Year	1	semester	2
7.	Course load expressed in ECTS credits	4			
8.	Teacher (in case of multiple teachers, a responsible teacher is appointed)	Prof. Aneta Mijoska, PhD and teachers from the Department of Dental Prosthetics			
9.	Course language	English			
10.	Necessary	For attendance: Signature for Technology of dental materials 1			

	prerequisites for listening to and passing the course	For exam: Passed Technology of dental materials 1 exam
11.	Course objectives (competencies) and learning outcomes:	The student will gain knowledge about the technology of modern dental materials used in the dental laboratory for the production of prosthetic, orthodontic and maxillofacial restorations. Utilizing the acquired knowledge to be able to make a choice of the most appropriate material and implement the materials in everyday practice in the production of all types of dental restorations.
12.	Detailed content of the course by chapters and units with learning outcomes for each chapter	Theoretical teaching Polymers – plastic materials – structure, chemical composition, physical properties, polymerization, processing and use 1 class <i>Learning outcomes: the student will be introduced to the polymer materials used in dentistry.</i> Acrylate materials – structure, chemical composition, physical characteristics, polymerization – hot and cold, self-bonding acrylates, processing and use 1 class <i>Learning outcomes: The student will be introduced to the acrylic materials used in dentistry, will gain knowledge about the composition - monomer and polymer, properties and polymerization, will understand the difference between cold and hot polymerization, the method of processing and application of acrylates.</i> Composite materials – structure, chemical composition, physical properties, polymerization, processing and use 1 class <i>Learning outcomes: The student will be introduced to composite materials, will gain knowledge about the composition and properties, polymerization, method of processing and application</i> Ceramic materials for metal-ceramics and for metal-free ceramics, composition, classification, sintering stages 1 class <i>Learning outcomes: The student will be introduced to ceramic materials in dentistry, their composition, classification and application. He will gain knowledge about new modern ceramic materials used in digital technology.</i> Insulation and deoxidation materials. Classification of insulation and opaque materials. Deoxidation agents-removal of oxides 1 class <i>Learning outcomes: The student will learn the division of insulating materials and the differences between them; will learn to perform the isolation of gypsum from gypsum, gypsum from acrylate and the means for insulating metal surfaces (opaque).</i> Materials for processing, sandblasting and polishing, types of processing, composition of materials for processing (natural and artificial), composition and work with materials and instruments for sandblasting and polishing, grinding bodies, means for abrasion and polishing 1 class <i>Learning outcomes: The student will learn the properties of natural and artificial abrasive materials and their purpose; will define the terms mechanical and electrolytic polishing; will be introduced to the abrasive bodies, their division and the method of working with them.</i> Metals - physical, mechanical and chemical characteristics, structure (crystal

	lattice and metallic bonds). Crystallization (homogeneous and heterogeneous) and crystal nuclei. Castability, hardness, elasticity, malleability. Melting and hardening 1 class <i>Outcomes of study: The student will learn how to explain the process of melting and cooling of metals;</i> Corrosion (chemical and electrolytic), stress corrosion, crevice corrosion, darkening and discoloration of metals 1 class <i>Outcomes of study: The student will learn what corrosion is and distinguish the different types of corrosion.</i> Alloys – concept, composition, properties and classification. Bonding of alloys at the atomic level (solid solutions and intermetallic compounds. Heat treatment of alloys in the solid state (refining, improving, hardening of alloys) 1 class <i>Learning outcomes: The student will learn about the process of alloying between metals, the internal structure; physical properties, mechanical properties, solidus point and liquidus point; will master the concepts of homogenization, refinement, cold working and recrystallization;</i> Dental materials in oral surgery and implantology (metals, polymers, ceramics, production of surgical and prosthetic guides, division of materials into biotolerant, bioinert and bioactive) 2 class <i>Learning outcomes: The student will be introduced to the materials used in oral surgery and implantology, their composition and working methods.</i> Materials for the production of implant-supported prosthetic restorations – temporary and definitive (composites, ependymes and hybrids) 1 class <i>Learning outcomes: The student will learn about the most modern materials for the production of implant-prosthetic constructions, temporary and permanent.</i> Dental materials in maxillofacial surgery, dental materials for the production of obturators, facial prostheses and epitheses 1 class <i>Learning outcomes: The student will be introduced to the materials used in the field of maxillofacial surgery and the materials for making devices for patients after surgical treatment.</i> Materials used in orthodontics: Polymers (acrylate, composite and rubber materials), metals and alloys used in orthodontics (steel wires, extensors, briquettes, brackets, rings) 1 class <i>Learning outcomes: The student acquires knowledge about the materials used in orthodontics – acrylate, composite materials and metals in orthodontics).</i> Means and protocol for disinfection, sterilization and prevention of the dental technician and the doctor of dental medicine – cross-infections. Infection control in dental work – (immunization, barrier and aseptic techniques). Storage, transport and disinfection of dental materials (method of production and composition)1 class <i>Learning outcomes: In the thirteenth chapter, the student gains knowledge about controlling cross-infections from pathogenic microorganisms in the dental office and laboratory, and also acquires knowledge about the most appropriate way to disinfect dental materials.</i>
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		Modern materials in the dental laboratory intended for CAD-CAM and 3D printing techniques, (PEEK: Polyether ether ketone. PMMA: Polymethyl methacrylate. PLA: Polylactic acid) 1 class <i>Learning outcomes: The student will be introduced to the most modern materials and techniques for 3D printing (PEEK: Polyether ether ketone. PMMA: Polymethyl methacrylate. PLA: Polylactic acid).</i> Total:15 classes <i>Exercises</i> <i>Exercises in accordance with the planned theoretical program, presentation of the topics by the students and active involvement of the students in the discussion of the given issues. Practical introduction to dental materials – acrylics, composites, ceramics 30 classes</i> Total 30 classes		
13	Interrelationship of objects	Course relation to Technology of dental materials 1		
14.	Detailed description of the teaching and working methods for the subject	Theoretical teaching, interactive teaching, practical teaching (exercises), seminar work and other forms foreseen by the common ECTS criteria		
15.	Total available classes fund	150 classes		
16.	Forms of teaching activities	16.1.	Lectures - theoretical teaching, classes	15
		16.2.	Exercises (<u>laboratory</u> , classroom), <u>seminars</u> , teamwork: classes	30
		16.3.	Practice: classes	
17.	Other forms of activities	17.1.	Project work: classes	
		17.2.	Individual work: classes	15
		17.3.	Homework - tasks	90
18	Signature requirements	Attendance to 60% of theoretical classes and 80% of exercises		
19	Method of the evaluation			
	19.1.	Tests: points	30	
	19.2.	Seminar work/project, written and oral presentation: points	10	
	19.3.	Final exam: points	60	
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, control of assistants in carrying out practical teaching and assessment of the achieved success of students, as well as the pass rate of students who have passed the course			
22.	Literature					
	22.1.	Compulsory literature				
		Serial number	Author	Title	Publisher	Year
		1.	Kovachevska Gordana, Aneta Mijoska	Dental materials - dental and clinical	Faculty of Dentistry	2019
		2.				
		3.				
	22.2.	For further reading				
		Serial number	Author	Title	Publisher	Year
		1.	Phillips	Science of dental materials	Elsevier	2003
		2.	Craig's	Restorative dental materials	Elsevier	2008
		3.				

Serial number: 11

Annex no. 3		First cycle study program			
1.	Title of courses	Technology of Fixed Protheseses - Crowns			
2.	Code	PDTMFC1			
3.	Study Program	Professional Dental Technicians			
4.	Organizer of the study program (unit, i.e. institute, department, division)	UKIM - Faculty of Dentistry – Skopje, Department of Dental Prosthetics			
5.	Degree (first, second, third cycle)	First Cycle			
6.	Academic year/semester	Year	1	semester	2
7.	Course load expressed in ECTS credits	8			
8.	Teacher (in case of multiple teachers, a responsible teacher is appointed)	Prof. Dr. Vesna Korunovska Stevkovska and teachers from the Department of Dental Prosthetics			
9.	Course language	English			
10.	Necessary prerequisites for listening to and passing the course	For attendance to the course: Signature for attended course Teeth Morphology 1 For exam: Passed exam in Teeth Morphology 1 and attended course of Teeth Morphology 2			
11.	Course objectives (competencies) and learning outcomes:	The student should learn the principles and techniques of laboratory production of artificial dental crowns. Prepare and introduce the student to the basic principles and methods of work in the dental laboratory - modeling and production of crowns from a technical aspect, and also to get acquainted with modern methods and systems, all-ceramic products and digital CAD-CAM technology. Acquire competencies and knowledge in the field of fixed prosthetics			