19	Method of the evaluation					
	19.1.	Tests: points				30
	19.2.	Seminar work/project, written and oral presentation: points				20
	19.3.	Final exam: points				50
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.	Veleski D.	Clinic and technique of partial dentures (book one)	Faculty of Dentistry UKIM, Skopje	2010
		2.	Veleski D.	Clinic and Technique of Partial Dentures (book two) Skeletonized and Metal Complex Dentures	Faculty of Dentistry UKIM, Skopje	2014
		3.	E. Jankulovska	Partial skeletonized denture - preclinical	Faculty of Dentistry, Skopje	2018
		4	Lj. Guguvchevski	Preclinical partial dentures		2008
		5	r. Stamenkovic	Stomatoloska protetika – parcijalna proteza (II dopunjeno izdanje).	Data Status Beograd	2017
	22.2.	For further reading				
		Serial number	Author	Title	Publisher	Year
		1.	James S Brudvik	Advanced Removable Partial Dentures	Quintenssence books	1999
		2.	Olcay Sakar	Removable Partial Dentures, A practitioners' manuel	Springer	2016
		3.				

Serial number: 38

Annex no. 3		**First cycle study program**
1.	Title of courses	Dental Ceramics 2

2.	Code	PDTMC23			
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	3	semester	6
7	Course load expressed in ECTS credits	5			
8.	Teacher (in case of multiple teachers, a responsible teacher is appointed)	Prof. Emilija Bajraktarova Valjakova, PhD and teachers from the Department of Dental Prosthetics			
9.	Course language	English			
10.	Necessary prerequisites for listening to and passing the course	Suggested courses: Dental laboratory equipment, Teeth Morphology 1 and 2, Technology of dental materials 1 and 2, Technology of Fixed Prostheses (crowns), and Technology of Fixed Prostheses (bridges) and signature from the course of Dental ceramics 1.			
11.	Course objectives (competencies) and learning outcomes:	The student will be introduced to the stages of fabrication of all-ceramic restorations made of various ceramic materials and using various working techniques: layering technique, hot pressing technique, CAD-CAM technique and 3-D printing technology.			
12.	Detailed content of the course by chapters and units with learning outcomes for each chapter	Theoretical teaching: Ceramic materials for pressing ..... 1 class *Learning outcomes: The student is introduced to ceramic materials for pressing, differing in chemical composition, physical properties and aesthetic characteristics, differing in color – monochromatic and polychromatic; is introduced to the meaning of the abbreviations used to mark ceramic ingots for pressing; the student is introduced to the instruments used when using this technique at work.* Hot pressing technique with leucite ceramics ..... 1 class *Learning outcomes: The student is introduced to the stages of hot pressing using leucite ceramic ingots and the various working techniques.* Hot pressing technique with monochromatic lithium disilicate ceramics ..... 1 class *Learning outcomes: The student is introduced to the stages of hot pressing using monochromatic lithium disilicate ceramic ingots and the various working techniques.* Hot pressing technique with polychromatic lithium disilicate ceramics ..... 1 class *Learning outcomes: The student is introduced to the stages of hot pressing using polychromatic lithium disilicate ceramic ingots and the various working techniques with them.* Hot pressing technique on a metal shell..... 1 class *Learning outcomes: The student is introduced to the specific Press-on-metal technique and all the phases in which the veneer structure is obtained by pressing ingots of leucite ceramic onto a metal shell.* Fabrication of ceramic restorations by layering on platinum foil ..... 1 class *Learning outcomes: The student is introduced to the specific technique of making crowns or vestibular veneers through condensation of a ceramic mass on platinum foil and its sintering.*			

		Fabrication of ceramic restorations by layering on refractory stump ..... 1 class *Learning outcomes: The student is introduced to the specific technique of making crowns or vestibular veneers through condensation of a ceramic mass on refractory stump and its sintering.* Layering technique with veneering ceramics on a zirconium dioxide shell ..... 1 class *Learning outcomes: The student is introduced to the layering technique where nano-fluoroapatite glass-ceramic is layered onto a zirconium dioxide shell structure obtained with CAD-CAM processing technology.* Hot pressing technique on a zirconium dioxide shell..... 1 class *Learning outcomes: The student is introduced to the specific Press-on technique, in which the veneer structure is obtained by pressing leucite ingots onto a zirconium dioxide shell structure obtained with CAD-CAM technology.* Technique for manufacturing the shell and veneer structure using CAD-CAM technology ..... 2 classes The student is introduced to specific working techniques: CAD-on, in which the veneer structure obtained from lithium disilicate ceramics is crystallized and fused with the shell structure of zirconium dioxide, both obtained with CAD-CAM technology; CAD-CAM fabrication of a shell structure of zirconium dioxide and a veneer structure of feldspar ceramics. Fabrication of root crowns ..... 1 class *Learning outcomes: The student is introduced to the various techniques for making root crowns: metal casting technique for crowns made of acrylic material; technique for making root crowns with a zirconium dioxide core and pressed ceramic, CAD-CAM made zirconium dioxide crowns.* 3-D printing ..... 1 class The student is introduced to the term "3-D printing", the historical development of this technology, and the fields of application. Different techniques of 3-D printing ..... 1 class *Learning outcomes: The student is introduced to the various techniques for 3-D printing : SLA, FDM, DLP, SLD, EBM, DMLS, SLS, etc.* Possibility of using 3-D printing technology in the dental laboratory ..... 1 class *Learning outcomes: The student is introduced to the possibility of manufacturing various instruments, devices and restorations using 3-D printing: trays for various purposes, surgical guides, 3-D models of the patient, guards and splints, orthodontic appliances, anatomical and studio models, temporary and definitive fixed-prosthetic restorations, partial and total removable prostheses.* ***Total: ..... 15 classes*** *Exercises:* *Final preparation of the metal shell before veneering with ceramic masses; application of opaquer, first and second layers and their firing; layering of cervical, dentin mass and application of enamel layer and their firing; application of second layer of cervical, dentin and enamel mass and their firing; internal*

		characterization, corrective firing and processing of the veneer ceramics; giving a definitive morphology to the surfaces, external color modification – characterization and glazing; demonstration of the production of all-ceramic restorations obtained by the layering method, hot pressing, restorations obtained with CAD/CAM technology and demonstration of 3-D printing. ***Total: ..... 90 classes***			
13.	Interrelationship of courses	This course is interrelated to the courses: Teeth Morphology 1 and 2, Dental laboratory equipment, Technology of dental materials 1 and 2, Technology of Fixed Prostheses (crowns), Technology of Fixed Prostheses (bridges), Occlusion and Dental ceramics 1.			
14.	Detailed description of the teaching and working methods for the subject	Theoretical teaching in a large group and student interaction, work in small groups during practical teaching, demonstration of the laboratory phases and independent work of students during the production of restorations, independent research, work in small groups during the preparation of seminar papers, work in a large group during the presentation of the same.			
15.	Total available classes fund	150 classes			
16.	Forms of teaching activities	16.1.	Lectures - theoretical teaching, classes	15	
		16.2.	Exercises (laboratory, classroom), seminars, teamwork: classes	90	
		16.3.	Practice: classes		
17.	Other forms of activities	17.1.	Project work: classes		
		17.2.	Individual work: classes		
		17.3.	Homework - tasks	45	
18	Signature requirements	Attendance to at least 60% of the theoretical classes and demonstrated activity in the classes, attendance to at least 80% of the laboratory exercises, and completing the foreseen laboratory stages, and presented project work.			
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 the demonstrator and teacher in carrying out practical teaching, 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.	Bajevska Jagoda, Bajevska Jana	Dental ceramics	Faculty of Dentistry	2014
		2.	Andres Baltzer, Vanik Kaufmann-Jinoian, Andreas Kurbad, Kurt Reichel	CAD/CAM i potpuna keramika: estetski nadomjesci u stomatološkoj praksi.	Media ogled	2009
		3.	Marko Jakovac	Protocol: Standardization in Fixed Prosthodontics.	Quintessence Publishing	2024
		4.	Stephen F. Rosenstiel, Martin F. Land, Robert Walter	Contemporary fixed prosthodontics 6th edition	Elsevier	2022
	22.2.	For further reading				
		Serial number	Author	Title	Publisher	Year
		1.	Bajraktarova Valjakova E, Korunoska-Stevkovska V, Kapusevska B, Gigovski N, Bajraktarova Misevska C, Grozdanov A.	Contemporary dental ceramic materials, a review: chemical composition, physical and mechanical properties, indications for use.	Open Access Maced J Med Sci. 2018;6(9):1742-55.	2018
		2.	Bajraktarova Valjakova E, Grozdanov A, Guguvcevski Lj, Korunoska-Stevkovska V, Kapusevska B, Gigovski N, Mijoska A, Bajraktarova Misevska C.	Acid etching as surface treatment method for luting of glass-ceramic restorations, part 1: Acids, application protocol and etching effectiveness.	Open Access Maced J Med Sci. 2018;6(3):568-73.	2018

		3.	Bajraktarova Valjakova E, Korunoska Stevkovska V, Georgieva S, Ivanovski K, Bajraktarova Misevska C, Mijoska A, Grozdanov A.	Hydrofluoric Acid: Burns and Systemic Toxicity, Protective Measures, Immediate and Hospital Medical Treatment.	Open Access Maced J Med Sci. 2018;6(11): 2257-2269.	2018

Serial number: 39

Annex no. 3		**First cycle study program**			
1.	Title of courses	Contemporary technologies in prosthodontics CAD/CAM			
2.	Code	PDTMCC3			
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	3	semester	6
7	Course load expressed in ECTS credits	4			
8.	Teacher (in case of multiple teachers, a responsible teacher is appointed)	Prof. Natasha Stavreva, PhD and teachers and associates from the Department of Dental Prosthetics			
9.	Course language	English			
10.	Necessary prerequisites for listening to and passing the course	Attended compulsory courses of second year, Removable Partial Dentures with Metal Framework and Dental ceramics 1			
11.	Course objectives (competencies) and learning outcomes:	The student will understand the digital workflow and integration of CAD/CAM systems in dental prosthetics. The student will obtain knowledge about the different types of digital imprint systems, about the digital design of prosthetic restorations using specialized CAD software and CAM manufacturing processes.			
12.	Detailed content of the course by chapters and units with learning outcomes for each chapter	Theoretical teaching - Lectures Chapter 1 Introduction and historical development of the CAD-CAM system ..... 1 class Components and features and process of CAD-CAM ..... 1 class Digital imprint systems, working with intraoral and laboratory scanners ..... 1 class Design and fabrication of CAD-CAM restorations. Digital Smile Design ..... 1 class Modern materials used for CAD-CAM-made restorations ..... 1 class Chair-side CAD-CAM systems, clinical and laboratory workflow ..... 1 class CAD-CAM technology in minimally invasive prosthetics: inlay, onlay and overlay restorations ..... 1 class CAD-CAM made aesthetic vestibular veneers ..... 1 class Crowns made with CAD-CAM technology ..... 1 class			