

		4	Lj. Guguvchevski	Preclinical partial dentures		2008
		5	G. 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	Quintessence books	1999
		2.	Olcaý Sakar	Removable Partial Dentures, A practitioners' manuel	Springer	2016

Serial number: 30

Annex no. 3		First cycle study program			
1.	Title of courses	Dental Ceramics 1			
2.	Code	PDTMC13			
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	5
7.	Course load expressed in ECTS credits	7			
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).			
11.	Course objectives (competencies) and learning outcomes:	The student will gain broader knowledge about ceramic materials, will be introduced to all phases of the fabrication of metal-ceramic restorations, from the analysis and casting of the imprints taken, to the glazing and placement of the finished metal-ceramic restoration in the patient's mouth; in this way, the student will be able to work independently and will have the competencies to fabricate metal-ceramic restorations.			
12.	Detailed content of the course by chapters and units with learning outcomes for each chapter	Theoretical teaching: - Dental ceramic materials 2 classes <i>Learning outcomes: The student will be introduced to the ceramic materials used in dentistry for the manufacture of fixed prosthetic restorations: their classification according to chemical composition and the condition in which the technician obtains them, their physical characteristics, aesthetic properties.</i> - Tooth preparation 2 classes <i>Learning outcomes: The student is introduced to the first phase of clinical work – tooth preparation and the different types of</i>			

		<i>demarcations, their shape and positioning in relation to the gingiva, the importance of demarcations for the work of the dental technician.</i> - Taking an imprint and pouring the imprint 2 classes <i>Learning outcomes: The student is introduced to various imprinting materials, imprint-taking techniques, assessment of the quality of the imprint taken, casting the imprint to obtain a working model with removable dental stumps – rules for placing Ney pins.</i> - Preparation of the working model and methods for obtaining the skeleton of metal-ceramic fixed prosthetics 2 classes <i>Learning outcomes: The student is introduced to the phases of preparation of working models and techniques for making the skeleton of metal-ceramic restorations.</i> - Pinning, investing and pouring the skeleton of metal-ceramic restorations 2 classes <i>Learning outcomes: The student is introduced to the stages of preparing the modeled skeleton for its casting: the rules of pinning, the rules of placing the pinned object in the cuvette, filling the cuvette with filling material, thermal preparation of the cuvette for its casting – heating, melting the dental alloy and methods of casting with dental alloys.</i> - Processing the metal skeleton for the manufacture of a metal-ceramic restoration 2 classes <i>Learning outcomes: The student is introduced to the phases of work after pouring the dental alloy cuvette, removing the filling material from the cast object, processing the shell with milling cutters, sandblasting and cleaning the metal shell.</i> - Types of connections between the metal as a shell and the ceramic as a veneer structure; conditioning the shell..... 2 classes <i>Learning outcomes: The student is introduced to the four types of bonds that need to be achieved between metal and ceramic to ensure the longevity of the metal-ceramic restoration in the patient's mouth, with special emphasis on the conditioning of the metal shell - degassing and oxidation.</i> -Choice of shade, instruments for veneering with ceramic materials, ceramic materials for the manufacture of metal-ceramic restorations 2 classes <i>Learning outcomes: The student is introduced to the instruments and devices for selecting the color and the method of determining the color of natural teeth; with the instruments for layering ceramic materials. The student is also introduced to the ceramic materials used in veneering the metal shell when producing metal-ceramic restorations: opaque, ceramic layering materials, gingival colors, ceramic materials for achieving certain effects, color modifiers (shades, intensifiers, stains), opaque and modeling liquids, glazing agents.</i> - Veneering the metal base with ceramic masses - technique of layering and condensation of ceramic layers..... 2 classes <i>Learning outcomes: The student is introduced to the phases of veneering – layering of ceramic materials on the prepared metal shell: applying and firing the first layer of opaquer, application and firing of the second and third layers of opaquer, application of ceramic masses and their condensation, first and second firing of the ceramics, correction firing, fitting of the restoration to the working model. Particular attention will be paid to the condensation of the applied ceramic masses, before their firing –</i>
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		<i>techniques of condensation of ceramics and its importance.</i> - Quality assessment of the fired ceramics 2 classes <i>Learning outcomes: The student learns how to recognize optimally fired ceramics, underfired ceramics, and overfired ceramics.</i> - Glazing and final processing 2 classes <i>Learning outcomes: The student is introduced to the final stages of the fabrication of metal-ceramic restorations: removal of the surface layer, techniques for applying glaze ceramics and glaze firing, external characterization – its advantages and disadvantages, metamerism; polishing agents and the importance of polishing the ceramic veneer before cementing the metal-ceramic restoration in the patient's mouth.</i> - Patient behavior after cementing metal-ceramic restorations 2 classes <i>Learning outcomes: Students are introduced to the instructions given to patients in order to ensure the longevity of metal-ceramic restorations in the patient's mouth.</i> - Metal-ceramic crown with ceramic rim 2 classes <i>Learning outcomes: The student becomes familiar with the metal-ceramic crown system with a ceramic rim, the indication for its fabrication, the materials and the fabrication technique.</i> - Errors in the fabrication of metal-ceramic restorations..... 2 classes <i>Learning outcomes: The student is introduced to the errors that can be made in all stages of the fabrication of metal-ceramic restorations:</i> - Fracture of a ceramic veneer and possibility of repair.. 2 classes <i>Learning outcomes: The student is introduced to the causes of ceramic veneer fracture, the degree of fracture, and the technique of working in extraoral repair.</i> Total: 30 classes <i>Exercises:</i> Introduction to the fabrication of metal-ceramic restorations; casting imprints, obtaining working models with movable tooth stumps and fixing in an articulator; modeling the shell of the metal-ceramic restoration in wax; pinning and filling the wax shell in a cuvette; thermal preparation of the cuvette and casting the object with dental alloy; removal of the cuvette and removal of the filling material from the cast object; cutting of the casting channels, processing of the metal shell with milling cutters; finishing, sandblasting, cleaning and conditioning of the metal shell. 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 Protheses (crowns), Technology of Fixed Protheses (bridges), and Occlusion.
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, discussions.
15.	Total available classes fund	210 classes

16.	Forms of teaching activities		16.1.	Lectures - theoretical teaching, classes	30	
			16.2.	Exercises (<u>laboratory</u> , 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	90	
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 completin the foreseen laboratory stages.			
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.	Stephen F. Rosenstiel, Martin F. Land, Robert Walter	Contemporary fixed prosthodontics 6 th edition	Elsevier	2022
		3.	Shillingburg H.T. et al.	Fundamentals of Fixed Prosthodontics 4 th edition	Quintessence Publishing Co. Chicago	2012
	22.2.	For further reading				
		Serial number	Author	Title	Publisher	Year

		1.	Bajraktarova Valjakova E, Guguvcevski Lj, Korunoska-Stevkovska V, Gigovski N, Kapusevska B, Mijoska A, Bajevska J, Bajraktarova Misevska C, Grozdanov A.	Dental ceramic materials, Part I: Technological development of all-ceramic dental materials.	Macedonian Dental Review 2018; 41(1-2):30-4.	2018
		2.				

Serial number: 31

Annex no. 3		First cycle study program				
1.	Title of courses	Orthodontic appliances 2				
2.	Code	PDTMOD3				
3.	Study Program	Professional Dental Technicians				
4.	Organizer of the study program (unit, i.e. institute, department, division)	UKIM - Faculty of Dentistry – Skopje, Orthodontics Department				
5.	Degree (first, second, third cycle)	First Cycle				
6.	Academic year/semester	Year	3	semester	5	
7.	Course load expressed in ECTS credits	5				
8.	Teacher (in case of multiple teachers, a responsible teacher is appointed)	Prof. Dr. Biljana Dzipunova and teachers from the Department of Orthodontics				
9.	Course language	English				
10.	Necessary prerequisites for listening to and passing the course	Passed Basics of orthodontics and Orthodontic appliances 1				
11.	Course objectives (competencies) and learning outcomes:	Detailed introduction of students to the design, techniques and methods of manufacturing different types of fixed orthodontic and retention appliances.				
12.	Detailed content of the course by chapters and units with learning outcomes for each chapter	Theoretical teaching: Chapter 1 – development, significance, specifics, modifications, biomechanics and indications of different types of fixed orthodontic appliances Introduction to modern types of fixed appliances and techniques, their components, indications and contraindications 2 classes Direct and indirect method of placing braces (bonding) 2 classes CAD / CAM technology in orthodontic technique 2 classes <i>Outcomes of the 1st chapter - the student acquires knowledge of modern techniques and protocols in fixed orthodontic therapy</i> Chapter 2 - fixed appliances with labiolingual technique for jaw expansion, molar distalization and correction of sagittal irregularities Fixed appliances with labiolingual technique - labial arch technique - lip bumper and high labial arch 2 classes				