



Pomorski Uniwersytet Medyczny w Szczecinie

SYLLABUS of the MODULE (SUBJECT)

General information

Module title: DENTAL MATERIALS AND EQUIPMENT	
Module type	Obligatory
Faculty PMU	Faculty of Medicine and Dentistry
Major	Medicine and Dentistry
Specialty	-
Level of study	long-cycle
Mode of study	full-time/part-time
Year of studies, semester	Year 2 /semester : 3
ECTS credits (incl. semester breakdown)	4
Type/s of training (Number of hours)	Lectures 4 /seminars-5 /practical classes45
Form of assessment*	<input type="checkbox"/> graded assessment: <ul style="list-style-type: none"> <input type="checkbox"/> descriptive <input type="checkbox"/> test <input type="checkbox"/> practical <input type="checkbox"/> oral <input checked="" type="checkbox"/> non-graded assessment <ul style="list-style-type: none"> <input checked="" type="checkbox"/> final examination: <ul style="list-style-type: none"> <input type="checkbox"/> descriptive <input checked="" type="checkbox"/> test <input checked="" type="checkbox"/> practical <input type="checkbox"/> oral
Head of the Department /Clinic, Unit	Dr hab. n. med. Danuta Lietz - Kijak
Tutor responsible for the module	Dr n. med. Helena Gronwald
Name and contact data of the unit	Department of Propedeutics, Physical Diagnosis and Dental Physiotherapy, al. Powstańców Wielkopolskich 72/70,11191,466 Szczecin 73
Department's/Clinic's/Unit's website	https://www.pum.edu.pl/wydzialy/wydzial-medycyny-i-stomatologii/zaklad-propedeutyki-i-fizykodiagnostyki-stomatologicznej
Language	Polish/English

* where applicable, replace into

Detailed information

Module objectives		<p>Teaching objectives of the subject is:</p> <ol style="list-style-type: none"> 1. Gaining knowledge of basic dental instruments and equipment and the ability to recognise and use them in a specific area of dentistry. 2. Gaining knowledge about dental materials: <ol style="list-style-type: none"> a) for temporary and permanent fillings in the conservative treatment of deciduous and permanent teeth b) used in the prevention of caries as well as in endodontic and cosmetic treatment. 3. Gaining knowledge of drugs used in caries treatment, endodontic treatment and bonding systems. 4. Obtaining skills concerning the preparation (manual and automatic) of materials, application techniques and curing methods of dental materials. 5. Gaining skills in the use of auxiliary equipment when placing fillings. <p>The learning objective will be fulfilled if the student is able to recognise and apply dental tools and materials for appropriate treatment procedures</p>
Prerequisite /essential requirements	Knowledge	<ol style="list-style-type: none"> 1. Knowledge of anatomy of permanent and deciduous teeth 2. Knowledge of histological structure of hard and soft tissues of the oral cavity. Knowledge of the physiology of the masticatory organ.
	Skills	<ol style="list-style-type: none"> 1. Basic manual skills. 2. Spatial imagination 3. Visual–motor coordination.
	Competences	<ol style="list-style-type: none"> 1. Self-education habit 2. Teamwork capability 3. Communication skills 4. Ability to be precise and persistent

Description of the learning outcomes for the subject/module			
No. of learning outcome	Student, who has passed the (subject)	SYMBOL (referring to) Learning outcomes for the major	Method of verification of learning outcomes*
W01	knows and understands principles of operation of dental equipment	B.W13.	ET – test examination EPR – practical examination K – colloquium W – entry test O – student’s active participation and attitude assessment
W02	knows and understands equipment of dental office and instrumentation for dental procedures	C.W23.	ET – test examination EPR – practical examination K – colloquium W – entry test O – student’s active participation and attitude assessment
W03	knows and understands definition and classification of basic and auxiliary dental materials	C.W24.	ET – test examination EPR – practical examination K – colloquium W – entry test O – student’s active participation and attitude assessment

W04	knows and understands composition, structure, properties, bonding and intended use of dental materials	C.W25.	ET – test examination EPR – practical examination K – colloquium W – entry test O – student’s active participation and attitude assessment
W05	knows and understands surface properties of tooth hard tissue and dental biomaterials	C.W26.	ET – test examination EPR – practical examination K – colloquium W – entry test O – student’s active participation and attitude assessment
W06	knows and understands adhesion and mechanism of developing adhesive joint and procedures for adhesive preparation of enamel, dentine and dental biomaterials surfaces	C.W27.	ET – test examination EPR – practical examination K – colloquium W – entry test O – student’s active participation and attitude assessment
W07	knows and understands the basic clinical procedures of dental hard tissue reconstruction and endodontic treatment	C.W28.	ET – test examination EPR – practical examination K – colloquium W – entry test O – student’s active participation and attitude assessment
W08	knows and undertands mechanisms of degradation (corrosion) of dental biomaterials in oral cavity and influence thereof on biological properties of materials .	C.W29.	ET – test examination EPR – practical examination K – colloquium W – entry test O – student’s active participation and attitude assessment
U01	is able to apply adhesive techniques	C.U10.	ET – test examination EPR – practical examination K – colloquium S – practical skills assessment O – student’s active participation and attitude assessment
U02	is able to select reconstructive according to properties of materials and clinical conditions	C.U11.	ET – test examination EPR – practical examination K – colloquium S – practical skills assessment O – student’s active participation and attitude assessment
K01	is ready to notice and recognize own limitations, make self-assessment of educational deficits and needs	K.5.	ET – test examination EPR – practical examination K – colloquium O – student’s active participation and attitude assessment
K02	is ready to use reliable sources of information	K.7.	ET – test examination EPR – practical examination K – colloquium O – student’s active participation and attitude assessment
K03	is ready to formulate opinions on various aspects of professional activity	K.10.	ET – test examination EPR – practical examination K – colloquium O – student’s active participation and attitude assessment

Table presenting LEARNING OUTCOMES in relation to the form of classes								
No. of learning outcome	Learning outcomes	Type of training						
		Lecture	Seminar	Practical	Clinical	Simulatio	E-learning	Other
W01	knows and understands principles of operation of dental equipment			X				
W02	knows and understands equipment of dental office and instrumentation for dental procedures			X				
W03	knows and understands definition and classification of basic and auxiliary dental materials	X		X				
W04	knows and understands composition, structure, properties, bonding and intended use of dental materials	X		X			X	
W05	knows and understands surface properties of tooth hard tissue and dental biomaterials		X	X				
W06	knows and understands adhesion and mechanism of developing adhesive joint and procedures for adhesive preparation of enamel, dentine and dental biomaterials surfaces		X	X				
W07	knows and understands the basic clinical procedures of dental hard tissue reconstruction and endodontic treatment			X			X	
W08	knows and undertands mechanisms of degradation (corrosion) of dental biomaterials in oral cavity and influence thereof on biological properties of materials	X	X					
U01	is able to apply adhesive techniques			X				
U02	is able to select reconstructive, prosthetic and binding materials according to properties of materials and clinical conditions			X				
K01	is ready to notice and recognize own limitations, make self-assessment of educational deficits and needs		X	X				
K02	is ready to use reliable sources of information		X	X				
K03	is ready to formulate opinions on various aspects of professional activity		X	X				

Table presenting TEACHING PROGRAMME			
No. of teaching programme	Teaching programme	Number of hours	References to learning outcomes
Winter semester			
Lectures			
TK02	Introduction to materials science. Classification of dental materials	1	C.W24.
TK03	Biocompatibility of dental materials and reaction of oral tissues	1	C.W25.
TK04	Perspectives for development of materials science		C.W24.

			C.W25.
Seminars			
TK01	Mechanical properties of dental materials: occlusal forces, forces acting on restorations. Stress - types: deformation, stress-strain curve. Modulus of elasticity (formulas). Elongation, compression, hardness, elasticity. Abrasion resistance, bending, bond strength. Mechanical properties of the surface of fillings.	2	C.W25. K.10.
TK02	Thermal properties and thermal conductivity of dental materials. Coordinates of thermal expansion. Heat generated during tissue and material preparation. Electrical properties and conductivity. Resistance. Electrochemical corrosion. Tarnishing and loss of colour. Water absorption, solubility, disintegration, bonding time.	2	C.W25. C.W29. K.10.
TK03	Optical properties, colour and its measurement, fluorescence, translucency of dental materials. Surface phenomena: forces involved in prosthesis retention, adhesion and bonding strength testing. Applications of nanomaterials in medicine. Coatings on implants. Examination of biomaterials in SEM, AFM, TEM microscopy. Tribology of surface of biomaterials, wear issues. Testing of materials including ceramic composites. Risks associated with nanotechnology. Use of nanofibres.	2	C.W25. C.W26. C.W27. K.10.
TK04	Amalgam in dentistry, properties, management. Limitation of exposure to Hg.	1	C.W25. K.7. K.10.
Practical classes			
TK01	Auxiliary equipment for placing fillings: tensioners and moulds (Ivory, Nystrom, Tofflemire, Mifam). Practical exercises on phantoms. PRACTICAL SKILLS ASSESSMENT	3	B.W13. C.W23. K.5.
TK02	Caries diagnostic methods, from traditional to the latest. Principles of cavity preparation according to Black. Contemporary cavity preparation methods Depending on materials and cavity class. Pulp vitality diagnostic devices.	3	C.W28.
TK03	Garrison, Profident, Supermat systems; Contact Matrix, Contact Wedge; tapes, strips, interdental wedges. Fibreglass in dentistry. Practical exercises on phantoms. PRACTICAL SKILLS ASSESSMENT	3	B.W13. C.W23. K.5.
TK04	Biological treatment materials, indirect and direct coverage. Calcium hydroxide in biological pulp treatment and in endodontics, MTA Biodentine, liners, primer varnishes. PRACTICAL SKILLS ASSESSMENT	3	C.W24. C.W25. K.5.
TK05	Water-based cements: glas-ionomers (filled and encapsulated), hybrid glas-ionomers, carboxyl, zinc-phosphate cements. PRACTICAL SKILLS ASSESSMENT	3	C.W24. C.W25. K.5.
TK06	Dental drills. Diagnostic kit. Tools used in dental specialities (conservative, periodontology, surgery, prosthetics, orthodontics) . Polymerisation lamps. PRACTICAL SKILLS ASSESSMENT	3	B.W13. C.W23. K.5.

TK07	Compomers, giomers: composition, properties, polymerization reaction, application. PRACTICAL SKILLS ASSESSMENT	3	C.W24. C.W25 C.U10. K.5.
TK08	Prophylactic materials: chemotherapeutic (pastes, gels, foams, rinses, varnishes, calcifying preparations). Fissure sealants (varnishes).	3	C.W24. C.W25.
TK09	Adhesion to dentin and enamel - mechanism, bond strength testing. Bonding systems, etchants and conditioners. Class I cavity filling on models. PRACTICAL SKILLS ASSESSMENT	3	C.W26 C.W27. C.U10. K.5.
TK10	Drills, tools for correction and polishing of fillings. Prophylaxis in dentistry. Small dental equipment. PRACTICAL SKILLS ASSESSMENT	3	C.W23. K.5.
TK11	Composites - composition, properties, polymerisation reaction, correct work with composites. Class I cavity filling on models. PRACTICAL SKILLS ASSESSMENT	3	C.W24. C.W25. C.U10. K.5.
TK12	Endodontic tools. Methods of chemo-mechanical root canal preparation, rinses, drugs. Methods of measuring root canal length. Root canal sealants. Dexadent and devitalizing agents. PRACTICAL SKILLS ASSESSMENT	3	C.W23. C.W28. K.5.
TK13	Materials used in cosmetic dentistry. Materials and preparations for whitening teeth. Filling of cavities cl. II on models. PRACTICAL SKILLS ASSESSMENT	3	C.W24. C.W25 C.U10. K.5.
TK14	Temporary materials: pre-made (flecher) and ready-made (light and chemo-cured) dressings, surgical, periodontal, endodontic dressings. Oil-based (zinc oxide eugenolic) and resins-based cements: for brackets, rings, compomer cements. Barriers PRACTICAL SKILLS ASSESSMENT	3	C.W24. C.W25. K.5.
TK15	Ormocerres, condensable composites, bulk, with special applications. Class II cavity filling and fissure sealing on models PRACTICAL SKILLS ASSESSMENT	3	C.W24. C.W25. C.U10. K.5.
Simulation			
E-learning			
TK01	Possibilities of using restorative materials in pathological conditions of hard dental tissues.	1	C.W28. C.U11. K.5. K.7.
Summer semester			
Lectures			
Seminar			
Practical classes			
Simulation			
E-learning			

Booklist:
Obligatory literature:
1. Powers J.M., Wataha J.C.: Materiały stomatologiczne . Elsevier Urban & Partner. Wrocław 2013, wyd.1
2. Craig R.: Materiały stomatologiczne red. John M. Powers, Ronald L. Sakaguchi. Wrocław : Elsevier Urban & Partner, cop. 2008
3. Stomatologia zachowawcza z endodoncją : zarys kliniczny : podręcznik dla studentów stomatologii: red. nauk. Zbigniew Jańczuk, Urszula Kaczmarek, Mariusz Lipski. Warszawa Wydawnictwo Lekarskie PZWL, 2014.
Literatura uzupełniająca
1. Mielczarek A., Kowalik R., Najman N.: Podręcznik dla asystentek i higienistek stomatologicznych. PZWL. Warszawa 2018.
2. O’Brein W.J.: Dental Materials and Their Selection. 2008
3. Lipski M.: Praktyczny słownik stomatologiczny. Czelej 2016.

Student’s workload	
Form of student’s activity (in-class participation; activeness, produce a report, etc.)	Student’s workload [h]
	Tutor
Contact hours with the tutor	
Time spent on preparation to seminars/ practical classes	
Time spent on reading recommended literature	
Time spent on writing report/making project	
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Time spent on preparing to colloquium/ entry test	
Time spent on preparing to exam	
Other	
Student’s workload in total	
ECTS credits for the course (in total)	4
Notes	

* Selected examples of methods of assessment:

EP – written examination

EU – oral examination

ET – test examination

EPR – practical examination

K – colloquium

R – report

S – practical skills assessment

RZC – practical classes report, incl. discussion on results

O – student’s active participation and attitude assessment

SL – lab report

SL – laboratory report

SP – case study

PS - assessment of student’s ability to work independently

W – entry test PM – multimedial presentation

other...