Integrated Pre-clinical Education 2nd year

1. IMPRINT

Academic Year	2025/2026
Department	Faculty of Medicine and Stomatology
Field of study	Medicine and Dentistry
Main scientific discipline	Medical science
Study Profile	General academic
Level of studies	Uniform MSc
Form of studies	Extramural study (paid)
Type of module / course	Obligatory
Form of verification of learning outcomes	Exam
Educational Unit / Educational Units	Department of Dental Propaedeutics and Prophylaxis, 59 Nowogrodzka str., 02-006, Warsaw, phone: 22 625 66 02, e-mail: zpips@wum.edu.pl
Head of Educational Unit / Heads of Educational Units	Leopold Wagner PhD, DDS
Course coordinator	Leopold Wagner PhD DDS, lwagner@wum.edu.pl
Person responsible for syllabus	Module Preclinical operative dentistry: Małgorzata Ponto-Wolska PhD DDS, malgorzata.ponto-wolska@wum.edu.pl Module Dental materials science: Krzysztof Wilk PhD DDS, krzysztof.wilk@wum.edu.pl Module Preclinical endodontics: Łukasz Zadrożny PhD DDS, lukasz.zadrozny@wum.edu.pl Module Preclinical prosthetics: Renata Lenkiewicz DDS, rlenkiewicz@wum.edu.pl, and Krzysztof Wilk PhD DDS, krzysztof.wilk@wum.edu.pl
Teachers	Małgorzata Ponto-Wolska PhD DDS malgorzata.ponto-wolska@wum.edu.pl , Krzysztof Wilk PhD DDS kwilk@wum.edu.pl, Łukasz Zadrożny PhD DDS lukasz.zadrozny@wum.edu.pl, Renata Lenkiewicz DDS rlenkiewicz@wum.edu.pl,

2. BASIC INFORMATION

Year and semester of studies	II year, III and IV semester	**Number of ECTS credits**	9,50

FORMS OF CLASSES	**Number of hours**	**ECTS credits calculation**
Contacting hours with academic teacher		
Lecture (L)	30	1,2
Seminar (S)	34	1,3
Discussions (D)	101	4,0
e-learning (e-L)	-	-
Practical classes (PC)	-	-
Work placement (WP)	-	-
Unassisted student's work		
Preparation for classes and completions	75	3,0

3. COURSE OBJECTIVES

C1	Module Dental materials science 1. Acquiring knowledge about dental office equipment and instruments used in various fields of dentistry. 2. Acquiring knowledge of basic and auxiliary dental materials and laboratory procedures. 3. Acquiring knowledge about the properties of the surface layers of tooth tissues and biomaterials. 4. Acquisition of knowledge regarding the degradation of biomaterials in oral conditions. 5. Acquiring the skills to use dental equipment and apparatus as well as the use of instruments. 6. Acquiring skills to work with auxiliary and basic materials.
C2	Module Preclinical operative dentistry 1. Obtaining knowledge of methods of using dental materials in conservative dentistry in the reconstruction of mineralized tissues. 2. Obtaining knowledge of the properties of mineralized tissues and preparation methods of adhesive systems. 3. Obtaining abilities to choose dental rebuilding materials based on their properties. 4. Obtaining abilities to use dental materials and adhesive systems for filling preparation in phantom models.
C3	Module Preclinical endodontics 1. Obtaining knowledge regarding performing endodontic procedures. 2. Obtaining knowledge of performing endodontic treatment at the phantom model. 3. Obtaining knowledge of tooth reconstruction after endodontic treatment at the phantom model.
C4	Module: Preclinical Prosthetics 1. Acquiring knowledge of the functional anatomy and biomechanics of the masticatory system, the anatomy of permanentteeth in terms of their function and position in the arch, the criteria for optimal functional occlusion, and adaptation, compensation, and feedback in the stomatognathic system. 2. Acquiring skills in spatial representation of the crown portions of teeth, with particular emphasis on occlusal planes. 3. Acquiring skills in working with auxiliary and basic materials.

4. STANDARDS OF LEARNING – DETAILED DESCRIPTION OF EFFECTS OF LEARNING

Code and number of effect of learning in accordance with standards of learning	**Effects in the field of preclinical science.**
Knowledge – Graduate* knows and understands:	
A.W7.	The anatomy of natural teeth;
C.W29.	Dental office and dental laboratory equipment and instruments used in dental procedures and in the laboratory performance of prosthetic restorations and orthodontic appliances;
C.W30.	The biomechanics of the masticatory system;
C.W31.	The definition and classification of basic and auxiliary dental materials;
C.W32.	The composition, structure, properties, purpose, and use of dental materials;
C.W33.	The surface properties of dental hard tissues and dental biomaterials;
C.W34.	The phenomenon of adhesion and procedures for adhesive surface preparation of enamel, dentin, and dental biomaterials;
C.W35.	The mechanisms of degradation (corrosion) of dental biomaterials in the oral cavity and their impact on the biological properties of dental materials;
C.W36.	Basic clinical procedures for the reconstruction of dental hard tissues and endodontic treatment;
C.W37.	Basic methods and technical-laboratory procedures for the performance of prosthetic restorations;
F.W5.	The principles of management of pulp diseases and mineralized dental tissues;
F.W7.	The morphology of dental caves and principles of endodontic treatment;
Skills– Graduate* is able to:	
C.U11.	Prepare a carious lesion and reconstruct missing mineralized tissues in a phantom tooth;
C.U12.	Perform endodontic treatment under dental simulation conditions;
C.U13.	Use adhesive techniques;
C.U14.	Select restorative, prosthetic, and bonding biomaterials based on material properties and clinical conditions;
C.U15.	Reproduce anatomical occlusal conditions and analyze occlusion;
C.U16.	Design of the prosthetic restorations;

5. ADDITIONAL EFFECTS OF LEARNING *(non-compulsory)*

Number of effect of learning	**Effects of learning in time**
Knowledge – Graduate knows and understands:	

K1	-
Skills– Graduate is able to:	
S1	-
Social Competencies – Graduate is ready for:	
SC1	-

6. CLASSES

Form of class	Class contents	Effects of Learning
	Dental materials science module	
L1 – lecture 1	Basic and auxiliary materials. Division, requirements, and mechanical-physical, chemical, and functional properties of dental materials.	C.W31., C.W32.
L2 – Lecture 2	Impression materials. Digital methods for replicating the prosthetic substratum. Requirements, classification, and application of impression materials - composition, properties, processing, advantageous and disadvantageous characteristics, and methods of impression disinfection.	C.W32.
L3 – Lecture 3	Plasters. Types, classes, applications, and properties of stones, catalysts a inhibitors of the setting reaction, mixing, and casting the model. Model production using 3D printing technology.	C.W32.
L4 – lecture 4	Waxes and moulding masses. Composition, classification, properties, and application of dental waxes and masses. Methods for digitally designing prosthetic restorations.	C.W32.
L5 – lecture 5	Temporary dental materials. Base and liner materials: classification, composition, application, and properties of dental cements and polymers.	C.W31., C.W32
L6 – lecture 6-7	Permanent filling materials. Classification, composition, curing mechanism, properties, and application of composites, glass ionomers, and hybrid materials.	C.W31., C.W32.
L7 – lecture 8-9	Surface properties of mineralized tissues and dental biomaterials. Surface layer, surface, and coatings - definitions, properties, and role of coatings, surface layers, and surfaces. Surface engineering - influence of microstructure, phase composition, and residual stress or functional properties of surface layers. Technology for shaping the surface layer of biomaterials. Principles of processing polymer components.	C.W32., C.W33., C.W34., C.W35.
L8 – lecture 10	Surface phenomena and adhesion to hard dental tissues. Adhesive systems: classification, properties, and applications.	C.W33., C.W34.
L9 – lecture 11	Root canal filling materials. Requirements, classification, types, advantages and disadvantages, clinical application of sealers, canal cones, and retrograde filling materials. Gutta-percha is used cold and warm. Tooth whitening.	C.W32.
L10 – lecture 12	Abrasives and polishing materials. Auxiliary materials: polyester and metallic matrices, matrices, wedges, applicators.	C.W31., C.W32.
S1 – seminar 1-3	CAD/CAM technology. Devices, prosthetic field scanning, design, substructure fabrication (milling, sintering), custom modelling, and use of prefabricated semi-finished products.	C.W29., C.W36., C.W37.

PC1 – Practical classes 1-9	Application of auxiliary materials. Creation of plaster models using rubber molds, mixing plaster and impression materials, taking an impression with alginate, casting a model from Class III plaster, and preparing the plaster model.	C.W29., C.W32., C.W37., C.U14, C.U16.
PC2 – Practical classes 10-21	Conversion of wax to acrylic. Modelling an upper canine in a 1:1 ratio using modelling wax, embedding the models in Class II plaster, scalding the wax, preparing the acrylic material, polymerizing the acrylic using the hot method, and mechanical processing of the acrylic models.	C.W32., C.W37., C.U14, C.U16.
PC3 – Practical classes 22-24	Conversion of wax to metal. Modelling the framework of a metal crown using casting wax, embedding it in a refractory mass, and mechanical processing of the cast.	C.W29., C.W32., C.W37., C.U14, C.U16.
PC4 – Practical classes 25-27	Materials used in conservative dentistry and endodontics. Preparation and mixing of materials for temporary, permanent and root canal filling in various forms: powder/liquid, powder/distilled water, paste/paste, capsules, syringes. Written test	C.W32., C.W37., C.U14, C.U16.
	Preclinical operative Dentistry module	
L 11 - Lecture 13-14	Teeth restorations: principles, instruments, materials.	C.W29., C.W32., C.W36.
L 12 - Lecture 15-16	Restorations of anterior teeth: anatomy repetition, restorative techniques for I, II and V class cavities, instruments, special effects of incisal edge	C.W32., C.W36.
L 13 - Lecture 17-18	Restoration of posterior teeth: anatomy repetition, restorative techniques for I, II class cavities, instruments	C.W32., C.W36.
S2 – Seminar 4-5	Procedures in conservative dentistry. Procedures for using adhesive materials, materials and methods used for filling class V cavities, choosing the color of the filling material.	C.W32., C.W33., C.W34. C.W36.
S3 – Seminar 6	Procedures in conservative dentistry. Materials and methods used for filling class I cavities.	C.W32., C.W36., C.U14
S4 - Seminar 7	Procedures in conservative dentistry. Materials and methods used for filling class II cavities.	C.W32., C.W36., C.U14
S5 – Seminar 8	Procedures in conservative dentistry. Materials and methods used for filling class III cavities.	C.W32., C.W36., C.U14
S6 – Seminar 9	Procedures in conservative dentistry. Materials and methods used for filling class IV cavities. Written test	C.W32., C.W36., C.U14.
PC5 – Practical Class 28-30	Class I. Preparation of a cavity in a phantom tooth (low-fidelity simulator), application of adhesive techniques and placement of a composite filling, preparation of filling. Additional training sessions on Simodont VR simulators.	C.U11., C.U13., C.U14.
PC6 – Practical Class 31-36	Class V. Preparation of two Class I cavities in phantom teeth (low-fidelity simulator), application of adhesive techniques and placement of a composite filling, and preparation of the fillings. Additional training sessions on Simodont VR simulators.	C.U11., C.U13., C.U14., C.U15.
PC7 – Practical Class 37-42	Class II. Preparation of a cavity in a phantom tooth (low-fidelity simulator), application of auxiliaries and adhesive techniques, placement of a composite filling, and preparation of the filling. Additional training sessions on Simodont VR simulators.	C.U11., C.U13., C.U14., C.U15.
PC8– Practical Class 43-48	Class III. Preparation of a cavity in a phantom tooth (low-fidelity simulator), application of auxiliaries and adhesive techniques, placement of a composite filling, and preparation of the filling.	C.U11., C.U13., C.U14., C.U15.

PC9– Practical Class 49-54	Class IV. Cavity preparation in a phantom tooth (low-fidelity simulator), use of ancillary accessories and adhesive techniques, placement of a composite filling, and preparation of the filling. Written test	C.U11., C.U13., C.U14., C.U15.
PC10– Practical Class 55-63	Class II. Cavity preparation in a phantom tooth (high-fidelity simulator), use of ancillary accessories and adhesive techniques, placement of a composite filling, and preparation of the filling.	C.U11., C.U13., C.U14., C.U15.
	Preclinical prosthetics module	
L 14- Lecture 19-20	Acrylic material. Composition, properties, applications, and polymerization methods of acrylic material, pressure-molded materials - procedures and applications.	C.W29., C.W32., C.W36., C.W37.
L 15- Lecture 21-22	Methods of shaping metals in dentistry. Classification, composition, properties, and applications of metal alloys, introduction to casting technologies.	C.W29., C.W32.
L 16- Lecture 23-24	Dental ceramics. Classification by application, processing methods, melting point, structure, and composition, as well as properties and laboratory procedures.	C.W32., C.W36., C.W37.
S7 – Seminar 10-12	Mandibular articulation states: compensation curves, mandibular rest position, vertical dimension of occlusion and methods of determining it, centric relation - registration methods, mandibular position in centric relation vs. Habitual occlusion, mandibular and dental guidance, the concept of mutually protective articulation, and biomechanics of the temporomandibular joints.	C.W30.
S8 – Seminar 13-15	Norms and types of occlusion: ideal and optimal occlusion, tooth contacts and occlusal surfaces and their characteristics, occlusal forces and their distribution in the stomatognathic system, concepts of occlusion in natural dentition and full dentures, the concept of simplified occlusal contacts in implant prosthetics	C.W30.
S9 – Seminar 16-18	Introduction to dental morphology in terms of function: spatial (3D) reconstruction of the coronal portion of selected teeth with particular emphasis on occlusal planes.	C.W30.
S10 – Seminar 19	Thermally formed materials. Types, applications, and laboratory procedures.	C.W37.
S11 – Seminar 20-22	Procedure for converting wax to acrylic and metal. Polymerization, polycondensation, and casting technologies.	C.W37.
S12 – Seminar 23-25	Surface degradation of materials in the oral cavity. Surface preparation of base materials, electropolishing, and biological inertness. Written test.	C.W33., C.W35.
PC11– Practical Class 64-66	The use of thermoformed materials. Making a teeth whitening tray from thermoformed material.	C.W32., C.W37., C.U14, C.U16.
PC12– Practical Class 67-68	Teeth morphology in the aspect of the function: spatial mapping (3D) of the crown part of selected incisal teeth in the plastic material, with particular emphasis on occlusive surfaces.	C.U15.
PC13– Practical Class 69-70	Teeth morphology in the aspect of the function: spatial reproduction (3D) of the crown part of selected fangs in the plastic material, with particular emphasis on occlusive surfaces.	C.U15.
PC14– Practical Class 71-72	Teeth morphology in the aspect of the function: spatial reproduction (3D) of the crown part of selected premolars in the plastic material, with particular emphasis on occlusive surfaces.	C.U15.

PC15– Practical Class 73-74	Teeth morphology in the aspect of the function: spatial reproduction (3D) of the crown part of selected molars in the plastic material, with particular emphasis on occlusive surfaces	C.U15.
	Preclinical endodontics module	
L17- Lecture 25	Pulp diseases. Aetiology, diagnosis, and prevention of pulp diseases.	F.W5., F.W7.
L18 - Lecture 26	Tooth restoration after endodontic treatment. Indications and contraindications to conservative treatment, materials, and clinical procedures.	C.W36.
L19 - Lecture 27-28	Materials and methods used in endodontic treatment.	F.W7., C.W32., C.W36.
L20 - Lecture 29-30	Materials and methods applied for root canal obturation. Single cone method, lateral and vertical condensation, thermoplastic methods.	F.W5., F.W7.
S13 – Seminar 26-28	Instruments used for mechanical canal preparation. Steel and NiTi instruments, procedures for using hand, machine, and ultrasonic instruments.	F.W5., F.W7.
S14 – Seminar 29-31	Chambers and canals morphology in different teeth groups.	A.W7.
S15 – Seminar 32-34	Methods for determining the working length. Radiological methods, apex locator. Written test	C.U12.
PC16– Practical Class 75-80	K- and H-file technique for straight canals. Mechanical preparation of straight canals on phantom blocks.	C.U12.
PC17– Practical Class 81-84	Steel-instrument technique for curved canals. Preparation of curved canals on a phantom model - complications (elbow, zip, and ledge preparation).	C.U12
PC18– Practical Class 85-97	Unclogging and mechanically preparing canals using various techniques. Preparation of canals on phantom blocks using the step-back and traditional methods. Root canal obturation methods.	C.U12.
PC19– Practical Class 98-101	Root canal obturation methods. Obturation using the single-point method, lateral condensation, and warm gutta-percha. Restoration of a tooth after endodontic treatment on a phantom model. Written test	C.U12., C.U13

7. LITERATURE

Obligatory

Module Dental materials science

1.Dental materials: properties and manipulation. Powers JM, Wataha JC. St. Luis. Mosby/Elsevier. 2013

2.Craig's restorative dental materials. Sakaguci RL, Powers JM. Philadelphia. Elsevier Mosby. cop. 2012

Module Preclinical operative Dentistry

1. Sturdevant's Art&Science of Operative Dentistry, 7th edition, Roberson T.M., Heymann H.O., Swift E.J., Mosby, St.Louis 2018,

2. Essentials of Dental Caries, Fourth Edition Edwina Kidd and Ole Fejerskov, Oxford University Press, Oxford 2016

Module Preclinical prosthetics

1. Wheeler's Dental Anatomy, Physiology and Occlusion. Nelson S.J., Ash M.M. Saunders/Elsevier 2020

2. Management of Temporomandibular Disorders and Occlusion. Okeson J.P. Mosby/Elsevier 2019

Module Preclinical endodontics

1. Clinical endodontics. A textbook 3rd Edition. Tronstad L. Georg Thieme Verlag. 2009

Supplementary

1. Applied dental materials. McCabe JF, Walls AWG. Oxford. Blackwell Publishing. corp. 2008

2. Essentials of Operative dentistry. Sherwood IA. Jaypee Brothers Medical Publishers. 2010

3. Applied occlusion. Wassel R., Naru A., Steele J., Nohl F. 2015 Quintessence Publishing

4. Recent literature via pubmed.com

8. VERIFYING THE EFFECT OF LEARNING

Code of the course effect of learning	Ways of verifying the effect of learning	Completion criterion
	Dental materials science module	
C.W29., C.W31. C.W32., C.W33. C.W34., C.W35. C.W37., C.U14. C.U16.	2 written colloquium (each at 10 descriptive questions)	Each question is scored on a scale of 0-1 points. Passing the colloquim's requires a minimum of 12 points (minimum 6 points from each test).
C.U14., C.U16	Observation and assessment of practical skills	Positive evaluation of each completed task.
	Preclinical operative Dentistry module	
C.W29., C.W31. C.W32., C.W33., C.W34. C.W36., C.W35., C.U11., C.U.13., C.U14., C.U15.	Written colloquium (5 descriptive questions)	Achieving the expected learning outcomes of at least 55%
C.U11., C.U.13., C.U14., C.U15.	Observation and assessment of practical skills	Positive evaluation of each completed task.
	Preclinical prosthetics module	
C.W30., C.W32., C.W33., C.W35., C.W36., C.W37.,	Written colloquium (20 questions)	Each question is scored on a scale of 0 to 1 point. A minimum score of 13 points is required to pass.
C.U14., C.U15., C.U16.	Observation and assessment of practical skills	Positive evaluation of each completed task.
	Preclinical endodontics module	
A.W7., F.W5., F.W7., C.W36.	Single choice test (10 questions online on the e-learning platform)	Achieving the expected learning outcomes of at least 55%
C.W36.,C.U12., C.U13.	Written colloquium (5 descriptive questions)	Each question is scored on a scale of 1 to 3 points. Passing requires achieving at least 9 points.
C.U12., C.U13.	Observation and assessment of practical skills	Positive evaluation of each completed task.
C.U11., C.U12., C.U14., C.U16.	2-part practical examination (OSCE): part 1 in the winter semester - 4 stations (2 each from the materials science and pre-clinical conservative dentistry modules) and part 2 in the summer semester - 4 stations (2 each from the preclinical endodontics and prosthetics modules).	Depending on the module, you can get from 3 to 7 points for the tasks. The exam is passed if you get at least 55% of the points and a positive assessment of each completed task. The points obtained from both parts of the OSCE are added together. In the event of

		obtaining more than 55% of the points, in the absence of a positive assessment of all the tasks, the retake is treated as a supplement to the 1st term. Obtaining less than 55% of the points results in an insufficient grade in the 1st term. The OSCE retake exam concerns only the completion of the tasks that did not receive a positive assessment.
C.W29., C.W30. C.W31. C.W32., C.W33., C.W34. C.W35., C.W36., C.W.37.	Electronic test exam (single choice test) in the summer session – 75 questions covering topics from 5 modules - ergonomics, materials science, preclinical conservative dentistry, preclinical endodontics and preclinical prosthetics. The exam takes place in a computer room at the Didactic Center of the Medical University of Warsaw or an examination room at the Medical Simulation Center. The final grade in the Integrated Preclinical Education subject is the average of the grades from the practical and theoretical parts, provided that a positive grade is obtained in both exams.	Grading scale: 2 (< 65%), 3 (65 – 72%), 3,5 (73 -79%), 4 (80-86%), 4,5 (87-93%) i 5 (94-100%).

9. ADDITIONAL INFORMATION

Persons responsible for teaching: Pre-clinical conservative dentistry: Małgorzata Ponto-Wolska, DDS. PhD, malgorzata.ponto-wolska@wum.edu.pl, Dental materials science: Krzysztof Wilk, DDS. PhD, kwilk@wum.edu.pl, Pre-clinical endodontics: Łukasz Zadrożny, DDS, PhD, Lukasz.zadrozny@wum.edu.pl, Pre-clinical prosthetics module: Krzysztof Wilk, DDS. PhD, kwilk@wum.edu.pl and Renata Lenkiewicz DDS, rlenkiewicz@wum.edu.pl

Completion of the course: weighted average of grades from individual modules with equal importance (50%) of knowledge and skills, provided that a positive grade is obtained for all partial passes and practical tasks.

The condition for passing the course is participation in all lectures, seminars and exercises. In each block, absence from 1 lecture, seminar and exercise is allowed. In case of absence due to health reasons, the student is obliged to provide a medical certificate within three working days.

A student who receives a negative grade for a partial pass is entitled to 2 resist dates.

Passing the exercises requires obtaining a positive assessment of each completed task. In case of absence, you must complete the planned tasks in the next week of classes. The student may also arrive at the academic teacher during his/her duty hours.

The condition for admission to the practical and theoretical examination is to pass all modules.

In a justified situation, a student may be late for classes up to 15 minutes.

You are not allowed to use mobile phones or other electronic devices during classes, and students may only bring items into the training room that the instructor has approved.

Students in the classroom must wear a medical (surgical) apron with a stand-up collar, knee-length 100 cm, tied at the back with strings, disposable gloves, tied-up hair or a cap and changed shoes.

Student Scientific Club at the Department of Propaedeutics and Dental Prophylaxis, supervisor: Łukasz Zadrożny, DDS, PhD, e-mail: lukasz.zadrozny@wum.edu.pl

Department's website: https://propedeutyka-stomatologiczna.wum.edu.pl

ATTENTION

The final 10 minutes of the last class in the block/semester/year should be allocated to students' Survey of Evaluation of Classes and Academic Teachers