





| Summer Semester  |                                  |  |  |    |   |  |  |   |  |  |  |  |  |
|--|----------------------------------|--|--|----|---|--|--|---|--|--|--|--|--|
| Direct (contact) education   |                                  |  |  | 30 |   |  |  |   |  |  |  |  |  |
| Online learning (synchronous)  |                                  | 15   |  |    |   |  |  |   |  |  |  |  |  |
| Online learning (asynchronous)   |                                  |  |  | 30 |   |  |  |   |  |  |  |  |  |
| TOTAL per year:  |                                  |  |  |    |   |  |  |   |  |  |  |  |  |
| Direct (contact) education   |                                  |  |  | 30 |   |  |  |   |  |  |  |  |  |
| Online learning (synchronous)  |                                  | 15   |  |    |   |  |  |   |  |  |  |  |  |
| Online learning (asynchronous)   |                                  |  |  | 30 |   |  |  |   |  |  |  |  |  |
| Educational objectives (max. 6 items)  |                                  |  |  |    |   |  |  |   |  |  |  |  |  |
| G.1 To familiarize students with theoretical and practical knowledge regarding root canal treatment (endodontic treatment) of phantom and natural teeth. |                                  |  |  |    |   |  |  |   |  |  |  |  |  |
| G.2 Preparing students to perform endodontic treatment.  |                                  |  |  |    |   |  |  |   |  |  |  |  |  |
| Education result matrix for module/course in relation to verification methods of the intended education result and the type of class                     |                                  |  |  |    |   |  |  |   |  |  |  |  |  |
| Number of course education result  | Number of major education result | Student who completes the module/course knows/is able to   |  |    | Methods of verification of intended education results (forming and summarising) |  |  | Form of didactic class<br><i>**enter the abbreviation</i> |  |  |  |  |  |
| <b>W 01</b>  | <b>CW 26</b>                     | To define the term of endodontium and pulp diseases  |  |    | Oral response,(F), test (P), OSCE   |  |  | SE,MC   |  |  |  |  |  |
| <b>W02</b>   | <b>CW 26</b>                     | To explain the diagnosis and treatment of reversible and irreversible diseases of pulp   |  |    | Oral response,(F), test (P),discussion (F), OSCE                                |  |  | SE, MC  |  |  |  |  |  |
| <b>W03</b>   | <b>CW 23</b>                     | To know and describe the instruments used to endodontics treatment (root canal tool)   |  |    | Oral response,(F), test (P),discussion (F), OSCE                                |  |  | MC  |  |  |  |  |  |
| <b>W04</b>   | <b>CW 28</b>                     | To explain the process: stages of endodontic treatment, endodontic access, working length, chemo-mechanical preparation and obturation of the root canal |  |    | Oral response,(F), test (P),discussion (F), OSCE                                |  |  | SE, MC  |  |  |  |  |  |
| <b>W05</b>   | <b>CW 25</b>                     | To describe the characteristics and clinical application of materials and medications used to endodontic treatment                                       |  |    | Oral response,(F), test (P),discussion (F), OSCE                                |  |  | SE, MC  |  |  |  |  |  |



|             |             |  |  |    |
|-------------|-------------|--|--|----|
| <b>U 01</b> | <b>C.U9</b> | To perform endodontic access in the natural teeth  | Observation,<br>Assessment   | MC |
| <b>U02</b>  | <b>C.U9</b> | To perform measurement of the canal working length of natural tooth  | Observation,<br>Assessment   | MC |
| <b>U03</b>  | <b>C.U9</b> | To perform chemo-mechanical preparation of the root canal in the natural teeth and the model (endodontic treatment)                    | Observation,<br>Assessment   | MC |
| <b>U04</b>  | <b>C.U9</b> | To perform of root canal obturation in natural teeth and a model by various methods  | Observation,<br>Assessment   | MC |
| <b>U05</b>  | <b>C.U9</b> | To be able to properly use endodontic tools and critically evaluate their work   | Observation,<br>Assessment   | MC |
| <b>U06</b>  | <b>C.U9</b> | To be able to place a dental rubber dam and work with the patient in a lying position  | Observation,<br>Assessment   | MC |
| <b>K 01</b> | <b>K 01</b> | To be able to create rules of the professional comradeship and the cooperation with representatives of other health care professionals | <u>Summarizing methods:</u><br>- constant evaluation by teacher (surveying)<br><u>Shaping methods:</u><br>- observation of student's work<br>- discussion during classes<br>- opinions of colleagues | MC |
| <b>K02</b>  | <b>K02</b>  | To cooperate in the group of professionals, in the environment multicultural and multinational   | <u>Summarizing methods:</u><br>- constant evaluation by teacher (surveying)<br><u>Shaping methods:</u><br>- observation of student's work<br>- discussion during classes<br>- opinions of colleagues | MC |
| <b>K03</b>  | <b>K03</b>  | To be aware of its own restrictions and is able to plan educational activity   | <u>Summarizing methods:</u><br>- constant evaluation by teacher (surveying)<br><u>Shaping methods:</u>   | MC |



|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  | <ul style="list-style-type: none"> <li>- observation of student's work</li> <li>- discussion during classes</li> <li>- opinions of colleagues</li> </ul> |  |
| <p>** L - lecture; SE - seminar; AC – auditorium classes; MC – major classes (non-clinical); CC – clinical classes; LC – laboratory classes; SCM – specialist classes (magister studies); CSC – classes in simulated conditions; FLC – foreign language course; PCP practical classes with patient; PE – physical education (obligatory); VP – vocational practice; SS – self-study, EL – E-learning .</p>   |  |  |  |  |
| <p>Please mark on scale 1-5 how the above effects place your classes in the following categories:<br/>communication of knowledge, skills or forming attitudes:<br/>Knowledge:4<br/>Skills: 4<br/>Social competences:4</p>  |  |  |  |  |
| <b>Student's amount of work (balance of ECTS points)</b>   |  |  |  |  |
| <b>Student's workload</b><br>(class participation, activity, preparation, etc.)  |  |  | <b>Student Workload (h)</b>  |  |
| 1. Contact hours:  |  |  | 30   |  |
| 2. Online learning hours (e-learning):   |  |  | 45   |  |
| 3. Student's own work (self-study):  |  |  | 100  |  |
| Total student's workload   |  |  | 175  |  |
| <b>ECTS points for module/course</b>   |  |  | 6  |  |
| Comments   |  |  |  |  |
| <b>Content of classes</b> (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)  |  |  |  |  |
| <b>Lectures</b>  |  |  |  |  |
| <b>Seminars</b>  |  |  |  |  |
| <p><b>I Introduction to endodontics:</b><br/> (1) Endodontium – dentinal-pulp complex, morphology of dental cavity<br/> (2) Clinical classification of pulp diseases<br/> (3) Methods of pulp diseases treatment<br/> (4) Biological methods (pulpitis reversible)<br/> - pulp capping - indirect and direct<br/> - pulpotomy (partial and total), indications and contraindications, step by step treatment<br/> (5) Endodontic instruments according treatment stages</p> <p><b>II Stages of endodontic treatment</b><br/> (1) Endodontic access<br/> (2) Chamber and canal orifices preparation (trepanation points, roof chamber removal, chamber horns removal, orifices location)</p> <p><b>III Stages of endodontic treatment</b><br/> - evaluation of root working length by apex locator and radiological methods<br/> - Chemo-mechanical preparation ( preparation techniques – conventional, step-back, step(crown)-down)<br/> - root canal irrigation, irrigants.</p> <p><b>IV Stages of endodontic treatment</b><br/> (1) root canal filling materials - division</p> |  |  |  |  |



(2) root canal filling techniques. Systems used to fill root canals (thermoplastic gutta-percha)

**V Materials used in root canal therapy:**

- root canal irrigation, root canal filling, medicines between visits, applications and indications.
- Complication connected with endodontic treatment
- Evaluation of the quality of root canal treatment

**Practical classes**

1.

**1. Biological methods**

| <u>Introduction</u>   | <u>Repetition</u>  | <u>Demonstration</u>   | <u>Practical</u>   |
|---|--|--|--|
| 1. Biological methods<br>2. Materials used in pulp diseases treatment, clinical technique<br>3. Direct pulp capping – indications, technique, restoration<br>4. Difference between direct pulp capping, pulpotomy and pulpectomy<br>5. Procedures, set of instruments and materials | 1. Teeth and instruments<br>- surface and anatomy<br>- Numerical identification of teeth WHO<br>2. Dental instruments, tips, drills (types and shapes)<br>3. Reminder information of sterilization and disinfection,<br>4. Protection of the doctor and patients - chemicals and sharp instruments | 1. Direct pulp capping, indication, procedure with tooth permanent filling (Ca(OH) <sub>2</sub> , GI, composite resin)<br>2. Steps in formocresol pulpotomy – extracted tooth presentation<br>3. Sequence of procedure | 1. Direct pulp capping, indication, procedure with tooth permanent filling (Ca(OH) <sub>2</sub> , GI, resin composite)<br>2. Formocresol pulpotomy method, treatment procedure |

**2. Morphology of root canals, Endodontic access**

| <u>Introduction</u>  | <u>Demonstration</u>  | <u>Practical</u>  |
|--|---|---|
| 1. Morphology of the tooth<br>2. Endodontic instruments (types, size according to ISO, application)<br>3. Endodontic access in particular anatomic groups of teeth<br>4. Complication connected with preparing of endodontic access, chamber and access to root canal. | 1. Endodontic access, chamber and access to root canal preparation in incisor, premolar and molar teeth<br>2. Sequence of procedure | 1. Preparation of endodontic access, chamber and orifices in 5 natural teeth (2 single rooted and 2 multi-rooted upper and lower teeth) |

**3. Rubber dam in endodontics, Diseases of the dental pulp.**

| <u>Introduction</u> | <u>Demonstration</u> | <u>Practical</u> |
|---------------------|----------------------|------------------|
|                     |                      |                  |



|   |   |  |
|---|---|--|
| <ol style="list-style-type: none"> <li>1. Rubber dam in endodontics</li> <li>2. Diseases of the dental pulp and periapical tissue.</li> <li>3. Endodontic therapy.</li> <li>4. Pulpothomy and pulpectomy</li> </ol> | <ol style="list-style-type: none"> <li>1. Rubber dam in endodontics (different technics)</li> </ol> | <ol style="list-style-type: none"> <li>1. Rubber dam in endodontics - 3 technics on different teeth</li> <li>2. Placing rubber dam on 6 anterior teeth with dental floss</li> <li>3. Placing rubber dam on 3 posterior teeth.</li> </ol> |
|---|---|--|

**4. Root working length determination.**

| <u>Introduction</u>   | <u>Demonstration</u>   | <u>Practical</u>  |
|---|--|---|
| <ol style="list-style-type: none"> <li>1. Root working length, measurement methods and its importance in endodontic treatment, reference point.</li> <li>2. Apex locator performance, radiological methods.</li> <li>3. Chemo-mechanical root canal preparation (irritant solutions, techniques)</li> <li>4. Sequence of procedure and types of used instruments (procedures).</li> </ol> | <ol style="list-style-type: none"> <li>1. Recapitulation of the root canal and the determination of the working length (demonstration on the phantom)</li> <li>2. Doing X-ray with file, determination of the working length.</li> <li>3. Calculate the diameter of the file in different points on the basis of the size and conicity.</li> </ol> | <ol style="list-style-type: none"> <li>1 Practicing of the measurement of the working canal length on the phantom in the natural tooth.</li> <li>2. Recapitulation of the root canal and the determination of the working length – plastic block 1 x</li> <li>3. Recapitulation of the root canal in 2 anterior natural teeth, doing X-ray and the calculation of the working length</li> <li>4. Calculation of the file diameter in different points.</li> </ol> |

**5. Recapitulation of the root canal, instruments, irrigants, step back**

| <u>Introduction</u>  | <u>Demonstration</u>  | <u>Practical</u>  |
|--|---|---|
| <ol style="list-style-type: none"> <li>1. Root canal preparation methods.</li> <li>2. Chemo-mechanical root canal preparation               <ol style="list-style-type: none"> <li>a. irritant solutions, lubricants</li> <li>b. techniques of root canal instrumentation - conventional, step back</li> </ol> </li> <li>3. Sequence of procedure and types of used instruments (procedures)</li> <li>4. Magnification in endodontics. Root canal preparation using a microscope.</li> </ol> | <ol style="list-style-type: none"> <li>1. Temporary root canal filling.</li> <li>2. Irrigants presentation</li> <li>3. Chemo-mechanical instrumentation (step-back) – endodontic plastic block</li> <li>4. Introduction to microscope.</li> </ol> | <ol style="list-style-type: none"> <li>1. Chemo-mechanical root canal preparation 2 natural teeth and 1 plastic block, X-ray with MAF</li> <li>2. Placing root canal temporary filling.</li> <li>3. Working with microscope.</li> </ol> |



### **6. Chemo-mechanical root canal preparation (crown down)**

| <b><u>Introduction</u></b>  | <b><u>Demonstration</u></b>   | <b><u>Practical</u></b>   |
|---|---|---|
| 1. Chemo-mechanical root canal preparation<br>a. irritant solutions and lubricants<br>b. techniques of root canal instrumentation - crown down (step down)<br>c. complication connected with pulp chamber preparation and canals instrumentation. | Chemo-mechanical instrumentation (crown down)<br>– endodontic plastic block | 1. Temporary filling removal.<br>2. Chemo-mechanical root canal preparation of 3 or 4 natural teeth (as indicated by the assistant - indicated molars) and 1 plastic block using crown down method. |

### **7. Root canal obturation (materials and methods)**

| <b><u>Introduction</u></b>  | <b><u>Demonstration</u></b>  | <b><u>Practical</u></b>   |
|---|--|---|
| 1. Ideal material for root canal obturation<br>2. Root canal sealers and points (types, properties)<br>3. Techniques of root canal obturation and instruments (sealer, sealer with single point, lateral condensation )<br>4. MAF and X-ray control<br>5. Evaluation criteria of proper root canal obturation | 1. Techniques of root canal obturation and instruments (sealer with single point, lateral condensation).<br>2. Instruments used in root canal obturation.<br>3. X ray control of MAF | 1 Irrigation of root canals, drying using paper points.<br>2. Temporary filling removal.<br>3. Filling of root canals in natural teeth using sealer with a single point, lateral condensation and 2 blocks prepared on previous exercises (recommendation above)<br>4. X-ray with MAF |

### **8. Lateral condensation**

| <b><u>Introduction</u></b>  | <b><u>Demonstration</u></b>   | <b><u>Practical</u></b>  |
|---|---|--|
| 1. Complication connected with root canal preparation and obturation, prevention of complications, cases presentation | 1. Complication connected with root canal obturation (X-ray, plastic block), overfillings, underfillings. | 1. Temporary filling removal.<br>2 Filling of natural root canals and 2 plastic blocks prepared on previous exercises using lateral condensation (recommendation above). |



### **9. Root canal preparation and obturation (warm gutta-percha)**

| <b><u>Introduction</u></b>   | <b><u>Demonstration</u></b>   | <b><u>Practical</u></b>  |
|--|---|--|
| 1. Root canal preparation using rotary NiTi files.<br>2. Techniques of root canal obturation and instruments (vertical condensation, Thermafil). | Root canal preparation using rotary NiTi files and obturation using warm gutta-percha condensation. | 1. Root canal preparation and obturation using warm gutta-percha condensation. |

### **10. One visit treatment**

| <b><u>Introduction</u></b>   | <b><u>Demonstration</u></b>   | <b><u>Practical</u></b>  |
|--|---|--|
| 1. One visit and multiple visit treatment, indicate prognosis.<br>2. Complication connected with root canal obturation, prevention of complications<br>3. Temporary root canal fillings. | Root canal preparation using rotary NiTi files and obturation using warm gutta-percha condensation. | 1. Root canal preparation and obturation using warm gutta-percha condensation. |

### **11. Reendo, microscope**

| <b><u>Introduction</u></b>  | <b><u>Demonstration</u></b>  | <b><u>Practical</u></b>   |
|---|--|---|
| 1. Indications for root canal re-treatment<br>2. Negotiations<br>3. The technique of treatment (removal of root canal materials, posts, broken files).<br>4. Chemicals and tools to reendo<br>5. Magnification in endodontics.<br>Preparation of the root canal using a microscope. | 1. Root canal preparation in natural teeth using microscope.<br>2. Reendo. | 1. Reendo - removing and renewed canal filling.<br>2. Root canal preparation in natural teeth using microscope. |

### **12. Posts**

| <b><u>Introduction</u></b>                      | <b><u>Demonstration</u></b>                             | <b><u>Practical</u></b>                          |
|---|---|--|
| Restoration of teeth after root canal treatment | Restoration of teeth after root canal treatment - posts | Restoration of teeth after root canal treatment. |





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|--|-----------------------------|---|
| <b>13. Cerec</b>   |                             |   |
| <b><u>Introduction</u></b>   | <b><u>Demonstration</u></b> | <b><u>Practical</u></b>   |
| Restoration of teeth after root canal treatment. Cerec   | CAD/CAM presentation        | The scan and design fillings  |
| <b>14. Credit course, Cerec</b>  |                             |   |
| <b><u>Introduction</u></b>   | <b><u>Demonstration</u></b> | <b><u>Practical</u></b>   |
| Credit course - test and essay. Cases preparation, analysis of the treatment. Prognosis.   |                             | Restoration of teeth after root canal treatment.  |
| <b>15. Credit course</b>   |                             |   |
| <b><u>Introduction</u></b>   | <b><u>Demonstration</u></b> | <b><u>Practical</u></b>   |
| 1. Credit course – improvement   |                             | 1. Credit of all procedures performed<br>2. Self-assessment of the effects of practical and theoretical |
| 2.   |                             |   |
| 3.   |                             |   |
| <b>Other</b>   |                             |   |
| <b>Basic literature</b> (list according to importance, no more than 3 items)<br>1.1 Tronstadt L.: Clinical endodontics. 2nd edition. Georg Thieme Verlag, Stuttgart 2009<br>2. Ingle J.I.: Endodontics. Text and CD-ROM for Macintosh and Windows. Decker B.C. 2008..                |                             |   |
| <b>Additional literature and other materials</b> (no more than 3 items)<br>.1. Torabinejad M., Walton R.E., Endodontics, principles and practice, 5th edition, Saunders Elsevier 2009  |                             |   |
| <b>Didactic resources requirements</b> (e.g. laboratory, multimedia projector, other...)<br>multimedia projector, phantoms (simulated patient), endodontic blocks, models, camera, a local computer network  |                             |   |
| <b>Preliminary conditions</b> (minimum requirements to be met by the student before starting the module/course)<br>Student should know the anatomy, morphology and histology of the individual teeth based on subjects from the I <sup>st</sup> and II <sup>nd</sup> years of study. |                             |   |



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| <p><b>Conditions to receive credit for the course</b> (specify the form and conditions of receiving credit for classes included in the module/course, admission terms to final theoretical or practical examination, its form and requirements to be met by the student to pass it and criteria for specific grades)</p> <p>Presence on seminars and exercises in accordance to the rules of study and rules of procedures of the Department of Conservative Dentistry and Pedodontics. Admission to credit is based on the implementation of certain procedures (that is, preparation and filling of root canals of 6 teeth and 3 endodontic blocks) and oral response (debate, discussion, presentation) and test validation of knowledge. Preclinical endodontic dentistry is the part of the exam allowing student to exercise on clinical OSCE.</p> |

| <b>Grade:</b>              | <b>Criteria</b> (only for courses/modules ending with an examination)                                       |
|----------------------------|---|
| Very Good<br>(5.0)         | achievement of learning outcomes covering all relevant aspects  |
| Good Plus<br>(4.5)         | achievement of learning outcomes covering all relevant aspects with some errors or inaccuracies             |
| Good<br>(4.0)              | achievement of intended learning outcomes, with omitting some of the less important aspects                 |
| Satisfactory Plus<br>(3.5) | achievement of intended learning outcomes, with omitting some important aspects or significant inaccuracies |
| Satisfactory<br>(3.0)      | achievement of intended learning outcomes, with omitting some important aspects or serious inaccuracies     |
|                            | <b>Criteria</b> (only for courses/modules ending with e credit)   |
| Credit                     |   |

| <b>Grade:</b>              | <b>Criteria</b> (examination evaluation criteria)   |
|----------------------------|---|
| Very Good<br>(5.0)         | achievement of learning outcomes covering all relevant aspects  |
| Good Plus<br>(4.5)         | achievement of learning outcomes covering all relevant aspects with some errors or inaccuracies             |
| Good<br>(4.0)              | achievement of intended learning outcomes, with omitting some of the less important aspects                 |
| Satisfactory Plus<br>(3.5) | achievement of intended learning outcomes, with omitting some important aspects or significant inaccuracies |
| Satisfactory<br>(3.0)      | achievement of intended learning outcomes, with omitting some important aspects or serious inaccuracies     |
| Unit realizing the subject | Department of Pedodontic and Preclinical Conservative Dentistry W. U. Med.                                  |



|              |  |
|--------------|--|
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|                               |  |
|-------------------------------|--|
| Person responsible for module | Prof. Maciej Dobrzyński, PhD,DSc   |
| Coordinator                   | Magdalena Wirzman  |
| Telephone                     | (71) 7840362   |
| E-Mail                        | <a href="mailto:magdalena.wirzman@umed.wroc.pl">magdalena.wirzman@umed.wroc.pl</a> |

| List of persons conducting specific classes |   |            |                      |                 |
|---|---|------------|----------------------|-----------------|
| Full name                                   | Degree/scientific or professional title | Discipline | Performed profession | Form of classes |
| Michał Biały                                | BDS                                     | Dentistry  | Dentist              | classes         |
| Magdalena Wirzman                           | BDS                                     | Dentistry  | Dentist              | seminars        |
|   |   |            |                      |                 |

**Date of Syllabus development**

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**Syllabus developed by**

.....Magdalena Wirzman.....

**Signature of Head of teaching unit**

..... Prof. Maciej Dobrzyński, PhD,DSc...

**Signature of Faculty Dean**

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