

MEDICAL UNIVERSITY – PLOVDIV

FACULTY OF DENTAL MEDICINE

ORTHODONTICS DEPARTMENT

ACADEMIC STANDARD FOR THE DISCIPLINE OF ORTHODONTICS

1. TRAINING OBJECTIVE

The training during the Orthodontics course is aimed at providing dental students with basic knowledge and skills. At the end of the course the students must know the basic principles of primary and secondary orthodontic prophylaxis as well as the etiology, pathogenesis and clinical presentation of dentomaxillary deformities and anomalies. They must also be familiar with the basic methods of clinical examination, biometric methods of examination and radiographic methods of examination in orthodontics. Students must know the development of dental arches and occlusion, as well as the growth and development of the facial skeleton. They must be able to make a proper prognosis and treatment plan and they must know the mechanisms of action and the application of the main orthodontic appliances.

2. SYLLABUS

ACADEMIC PLAN

Academic discipline	Examinations	Classes			Classes per years and semesters			
	Semester	Total	Lectures	Seminars	VI	VII	VIII	IX
Orthodontics	IX	225	60	165	1/2	1/2	1/3	1/4

COURSE TIMETABLE

LECTURE TIMETABLE

Year III, Semester VI

№	TOPIC	CLASSES	DATE SIGNATURE
1.	Scope of orthodontics and its interdisciplinary relations to other medical fields. Orthodontic terminology. Introduction to the development of the main	1 class	

	<p>orthodontic procedures and historical development of orthodontics in Bulgaria. Terminology and deviations from the norm.</p>		
2.	<p>Biometric evaluation methods in orthodontics. Specific orthodontic diagnostics. Tooth-size discrepancies. Dental arch discrepancies: tooth-size analysis, arch segment analysis, dento-alveolar and craniofacial discrepancies. Analysis of the steps for diagnostics of deviations in teeth and dental arches. Theoretical explanation of indicators in use.</p>	1 class	
3 .	<p>Biometric evaluation methods. Analysis of the occlusion of primary, mixed and permanent dentition. Introduction to occlusion diagnostics of the three types of dentition. Permanent Dentition Occlusion Analysis.</p>	2 class	
4.	<p>Development and occlusion of dental arches. Dental Arches and Occlusion Development Prognosis of primary, mixed and permanent dentition. Growth and development parameters and patterns. Centres of growth and prognosis for dental arches' parameters.</p>	1 class	
5	<p>Facial Growth. Facial growth areas and patterns. Hypo and hyper-divergent facial types.</p>	2 class	

6.	Diagnostics in orthodontics. Clinical evaluation methods. Diagnostic approaches in clinical assessments – methods and means.	1 class	
7.	Orthodontic diagnosis and photographic analysis. Radiographic examination methods in orthodontics. Photographic analysis of sagittal, vertical and transversal facial proportions from cross-section /lateral/ and panoramic photographs. Intraoral periapical and occlusal radiograph, panoramic radiograph – necessity and diagnostics.	1 class	
8.	Cephalometric radiography. Lateral cephalometric radiography application. Cephalometric analysis- points, lines, planes and angles. Normal values.	1 class	
9.	Methods for assessment of the main functions of the orofacial complex. Functional clinical and paraclinical tests and examinations. Diagnostics of parafunctions.	1 class	
10.	Orthodontic appliances' classification and their action. Basic elements of the lingual plate. Types of orthodontic appliances according to their purpose, source of force, type of action, place of application and mobility.	1 class	

11.	Lingual plate – planning, action and variations. Lingual plate – mechanism, action and making. Indications for application and activation. Lingual plate modifications and their action.	1 class	
12.	Fixed appliances with mechanical action: Angle's appliance and Edgewise appliance system. Basic principles of operation of Angle's appliance and basic principles of operation of the fixed appliances.	1 class	
13.	Treatment stages with fixed appliances. Edgewise system - types of elements, indications for application, activation, retention.	1 class	
14.	Extraoral appliances-stages of treatment and their characteristics.	1 class	

15.	Interceptive appliances. Basic principles of operation, forces, anchorage and biomechanics. Indications for application. Types of interceptive appliances according to their purpose and manner of application.	1 class	
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TOTAL: 15 classes

SEMINARS SCHEDULE

3rd Year, 6th Semester

№	TOPIC	CLASSES	DATE
1.	Brief history and scope of orthodontics – introductory seminar	2	
2.	Impression-taking procedure of the maxilla	2	
3.	Impression-taking procedure of the mandibula	2	
4.	Centric occlusion registration. Orientation of the casts in relation to the three main orthodontic planes	2	
5.	Orthodontic cast analysis. Analysis of the single-tooth discrepancies.	2	
6.	Orthodontic cast analysis. Dental arches analysis of permanent dentition	2	
7.	Orthodontic cast analysis. Occlusion analysis of permanent dentition	2	

8.	Preliminary oral exam on anthropometric assessment of teeth, dental arches and occlusion.	2	
9.	Lingual plate. Vestibular arch	2	
10.	Retentive elements of the lingual plate – Schwarz clasp and Adams clasp	2	
11.	Plastic part /plate/ as a compulsory element of the lingual plate. Other active elements of the lingual plate	2	
12.	Periapical radiography and panoramic radiography	2	
13.	Lateral cephalometric radiography – general terms	2	
14.	Demonstration of making orthodontic appliances from photopolymer plastic	2	
15.	Handing in completed student's work. Receiving the associate professor's signature.	2	

Total: 30 classes

LECTURES SCHEDULE

4rd Year, 7th Semester

No	TOPIC	CLASSES	DATE SIGNATURE
1.	Clinical and paraclinical diagnostics of dental and jaw deformities. Differential diagnosis. Summary.	1 class	

2.	Functional and combined appliances – Schwarz appliance, monoblock, activator, lingual plate with inclined bite plane. Principles of action of functional appliances. Design and action of activator and monoblock. Lingual plate with inclined bite plane – appliance construction, indication for use, action and activation.	2 class	
3.	Functional appliances normalizing the action of intraoral and extraoral group of muscles – Klammt and Balters appliances, Frankel functional regulator. Klammt, Balters and Frankel appliances – construction, types, appliances design, their activation and principles of action, indications for use.	2 class	
4.	The Norm concept in Orthodontics. Classification of dental and jaw deformities – deformations and anomalies. Types of norm. Parameters of norm in primary, mixed and permanent dentition. Angle, Simon, Katz, Kantorovich. Classifications – characteristics.	2 class	
5.	Etiology of malocclusions. Genetic, functional and morphologic etiological factors causing norm deviations in dento-facial region.	2 class	
6.	Tooth deviations – in number, on shape and size. Etiology diagnostics, clinic and treatment of tooth denations – microdontia, macrodontia, hypo-and hyperodontia, anodontia.	2 class	
7.	Tooth position denations. Diastemas and tremas – types, etiology,	2 class	

	diagnostics, clinic and treatment. Diagnosis of rotations, inclinations, and tooth position. Diastemas and tremas definition, types, diagnostics and treatment.		
8.	Transversal dental arch deviations – types, etiology, diagnoses, prophylaxis and treatment. Tranversal cliniatrons of single dental arch - deffinition, Compression and expansion – diagnostics /clinical and paraclinical diagnostics/. Types, etiology and treatment according to dentition.	2 class	

TOTAL: 15 classes

SEMINARS SCHEDULE

4rd Year, 7th Semester

Nº	TOPIC	CLASSES	DATE
1.	Entry level exam. Diagnostic methods in Orthodontics – clinical methods of examination.	2	
2.	Entry level oral exam. Orthodontic analysis on study cast models. Biometric	2	
3.	Clinical evaluation /anamnesis and status/. New patients registration	2	
4.	Centric occlusion registration. Study cast models preparation.	2	
5.	Orthodontic cast analysis.	2	

6.	Working bite. Treatment plan.	2	
7.	Radiographic analysis.	2	
8.	Diagnosis and prognosis in Orthodontics.	2	
9.	Midterm oral exam on orthodontic appliances with mechanical action – lingual plate.	2	
10.	Midterm oral exam on fixed orthodontic appliances with mechanical action.	2	
11.	Fabrication of the appliances.	2	
12.	Patients follow - up	2	
13.	Midterm oral exam on Functional appliances.	2	
14.	Folow – up. Patient’s medical records.	2	
15.	Handing in completed student's work. Receiving the associate professor's signature.	2	

Total: 30 classes

LECTURES SCHEDULE

4rd Year, 8 Semester

No	TOPIC	CLASSES	DATE SIGNATURE
1.	Transversal dental arch deviations- types, etiology, diagnoses, prophylaxis and treatment. Transversal cliniatrons of single dental arch- definition. Compression and	2 class	

	expansion- diagnostics /clinical and paraclinical diagnostics/. Types, etiology and treatment according to dentition.		
2.	Sagittal dental arch deviations- protrusion, retrusion, medialized and distalised posterior teeth- etiology, diagnosis, prevention and treatment. - Definition of sagittal tooth- jaw deformations of a single jaw. - Diagnosis of protrusion and retrusion- clinical and paraclinical assessment. - Diagnosis of medialized and distalised posterior teeth. - Differential diagnosis, prevention, treatment of sagittal dental arch deviations in the three dentitions.	2 class	
3.	Deviations in occlusion. Cross-bite- Angle Class I- etiology, diagnosis, prevention. Definition, etiology, differential diagnosis, prevention and treatment of anterior cross-bite.	2 class	
4.	Sagittal deviations in occlusion- Angle Class II and skeletal Class II- etiology, diagnosis, prevention and treatment. Prognathia and Degbis- Angle Class II and Skeletal Class II. - Definition, types. - Etiology. - Clinical features. - Diagnosis and treatment in the three dentitions.	2 class	
5.	Sagittal deviations in occlusion- Angle Class III and Skeletal Class III- etiology, diagnosis, prevention and treatment. Progenia- Angle Class III and Skeletal Class III - Definition, types. - Etiology. - Clinical features. - Diagnosis and treatment in the	2 class	

	three dentitions.		
6.	Transversal deviations in occlusion laterognathia, laterodeviation- etiology, diagnosis, prevention and treatment. - Laterognathia and laterodeviation- differential diagnosis, prevention, treatment approaches.	2 class	
7.	Vertical deviations in occlusion - Definition, types. - Etiology. - Clinical features. - Diagnosis and treatment in the three dentitions. - Open bite, deep bite	2 class	

TOTAL: 14 classes

SEMINARS SCHEDULE

4rd Year, 8 Semester

No	TOPIC	CLASSES	DATE
1.	Intraductory seminar.	3	
2.	Prognastic analysis of the dental arch in mixed dentition.	3	
3.	Craniofacial growth and development.	3	
4.	Sagittal dental arch deviations- protrusion and retrusion.	3	
5.	Transversal dental arch deviations- compression and expansion.	3	
6.	Sagittal deviations in the occlusion Angle Class II malocclusions and skeletal Class II	3	

7.	Sagittal deviation in the occlusion- Angle Class III malocclusion and skeletal Class III	3	
8.	Transversal deviations in the occlusion	3	
9.	Vertical deviations in the occlusion	3	
10.	Edgewise technique- Part I	3	
11.	Edgewise technique- Part II	3	
12.	Maxillary extraoral appliances	3	
13.	Mandibular extraoral appliances	3	
14.	Handing in documentation	3	
15.	Accepting the documentation. Receiving the associate professor's signature.	3	

Total: 45 classes

LECTURES SCHEDULE

V Year, IX Semester

No	TOPIC	CLASSES	DATE
1.	Orthodontic analysis nosological units, classification of malocclusions /summary/	2 ч.	
2.	Orthodontic forces. Biomechanics, types of forces.	2 ч.	
3.	Tissue changes under the effect of orthodontic forces.	2 ч.	
4.	Prevention of dentomaxillary deformities. Types of prevention – aim, activities, executants. Myogymnastics in orthodontics. Indications for application in cases of different malocclusions and muscles disfunctions	2 ч.	
5.	Severe malocclusions – malocclusions with combination with clefts lip and	2 ч.	

	palate – etiology, clinical characteristics and time of treatment - malocclusions with combination with sundroms.		
6.	Combined orthodontic and prosthetic treatment of malocclusia . Role of the orthodontist. In preparation of the case.	2 ч.	
7.	Combined orthodontic and surgical treatment of malocclusion. Role of the orthodontist. Extraction of teeth. Indications and contra indications. Surgical approaches of treatment of malocclusions. Case preparation for combined orthodontic – surgical treatment.	2 ч.	
8.	Orthodontic relapse – Retention and retention periods, retention appliances duration of orthodontic retention.	2 ч.	

TOTAL: 16 classes

SEMINARS SCHEDULE

V Year, IX Semester – Theoretical exercises

№	TOPIC	CLASSES	DATE
1.	Terminology and the Norm concepts in Orthodontics	2	
2.	Etiology of malocclusions. Malocclusions as a result of hereditary factors and teratogenic factors. Endocrine disorders as etiological factors for malocclusion	2	
3.	Bad oral habits and parafunctions as etiological factors for malocclusion	2	
4.	Primary prevention of orthodontic malocclusions during pregnancy and first year of development	2	
5.	Prevention during the development of the primary dentition- until the 3rd year of development	2	
6.	Prevention in primary dentition between the 3rd and 6th years of development	2	
7.	Prevention during primary and secondary schoolage	2	

8.	Types of measures eliminating the abnormal oral habits. Interceptive appliances- passive interceptive appliances.	2	
9.	Types of measures eliminating the abnormal oral habits. Active interceptive appliances	2	
10.	Types of measures eliminating the abnormal oral habits. Prosthetics treatment in childhood	2	
11.	Space maintainers indications and application	2	
12.	Types of measures eliminating the abnormal oral habits. Pre-fabricated interceptive appliances	2	
13.	The role of the general dental practitioner in prevention of malocclusions. Development of the dental arches and the occlusion	2	
14.	Myofunctional preventive therapy normalizing tone muscles in maxillofacial region	2	
15.	Arrangement and schedule of the interceptive procedures	2	

Total: 30 classes

SEMINARS SCHEDULE

V Year, IX Semester - Clinics

No	TOPIC	CLASSES	DATE
1.	Clinical and paraclinical methods of examination in Orthodontics	2	
2.	Methods for measuring the apical base	2	
3.	Orthodontic forces	2	
4.	Tissue changes under the action of orthodontic forces	2	
5.	Biomechanics in Orthodontics	2	
6.	Tooth extraction as part of the orthodontic treatment	2	
7.	Impacted teeth	2	
8.	Congenital clefts of the lip, alveolar ridge and palate	2	
9.	Tooth discrepancies midterm exam	2	
10.	Methods for balancing the occlusion. Selective grinding of teeth	2	
11.	The role of the general practitioner in collaboration	2	

	with the orthodontist during the orthodontic treatment		
12.	The role of the orthodontist in the complex orthodontic surgical treatment	2	
13.	The role of the orthodontist in the complex orthodontic-periodontal and prosthetic treatment	2	
14.	Relapse. Retention period	2	
15.	Accepting the documentation. Receiving the associate professor	2	

Total: 30 classes

3. PREREQUISITES

In order to begin clinical training in the discipline, a student must have successfully passed a colloquium exam in Preclinical Orthodontics. After completing the course, students must have the following knowledge and skills:

- they know and conduct primary and secondary orthodontic prophylaxis;
- they know the etiology, pathogenesis and clinical presentation of dentomaxillary deformities;
- they know the basic clinical, biometric and radiographic methods of orthodontic examination;
- they know the development of dental arches and occlusion;
- they know the growth and development of the facial skeleton and are able to make a proper prognosis and treatment plan;
- they are able to correctly apply the main removable orthodontic appliances in the treatment of dentomaxillary deformities and anomalies.

4. ACADEMIC RESOURCES

The department must have the necessary number of teachers in accordance with the adopted norms for the teaching workload of the lecturers at MU, FDM - Plovdiv. The lecturers must have excellent theoretical and practical training and specialty in the discipline of Orthodontics. They must actively participate in the realization of the department plan of scientific research performance, guided by the latest achievements in the field.

5. MATERIAL RESOURCES

The department must provide the necessary number of halls for the Preclinical Orthodontic training, dental units, orthodontic instruments, dental materials, computer configurations and multimedia equipment.

6. LECTURE COURSE

Multimedia presentations of the lecture course are provided to the students electronically.

7. PRACTICAL SEMINARS

A/ The seminars in Preclinical Orthodontics in Year 3 are held in the designated seminar halls. Under the guidance and supervision of the assistant, students make diagnostic and working study models of maxillae and mandibles, study the basic clinical methods of examination in orthodontics, perform biometric analyses of study casts, study the rules and techniques for fabricating a wax pattern of a lingual plate/vestibular arch, Adams clasp, Schwarz clasp, wax modeling of the plate component of the lingual plate/. They study the radiographic methods of examination in orthodontics.

B/ Clinical Seminars

They are held in the clinical halls designated for this purpose. Seminars are held and tests are provided for the seminars. They check the student's preparation and knowledge of the specific practice task. Under the guidance and supervision of the assistant, students perform orthodontic treatment by: taking anamnesis, taking alginate impressions of the maxilla and mandible of the patient, performing a biometric analysis of the patient's dental casts and radiographs, bending the wire elements of the planned orthodontic removable appliance. After the appliance is fabricated, it is adjusted in the mouth of the patient, then students monitor it monthly and activate the orthodontic appliance.

8. INFORMATION RESOURCES. MAIN LITERARY SOURCES. SITES.

The lecturer has the obligation to develop lectures and seminars in the discipline and provide them to the students in an electronic version.

LITERARY SOURCES

1. Athanasiou, A. Orthodontic Cephalometry, 1995, Mosby.
2. Begg, P.R. and Kesling, P.C., Begg Orthodontic and Technique, Saunders, Philadelphia, 1971.
3. Bennett, J., McLaughlin, R. Orthodontic Treatment Mechanics and the Preadjusted Appliance, 1993. Mosby.
4. Bishara, S., Textbook of Orthodontics, 2001, Saunders Company.

5. Dawson, P.E. Evaluation, Diagnosis, and Treatment of Occlusal Problems, C.V. Mosby, St. Louis, 1974.
6. Enlow, D.H. Handbook of Facial Growth, Philadelphia, 1982.
7. Enlow, D.H. Facial Growth and Facial Orthodontics, Quint, 1986, vol. 2.
8. Geiger, A. and Hirschfeld, L.; Minor tooth movement in general practice, Mosby, St. Louis, 1974.
9. Gianelly, A. A. and Goldman, A.M. Biologic basis of Orthodontics, Philadelphia, 1971.
10. Graber, T.M. Orthodontics. 3rd ed. W.B. Sanders, Philadelphia, 1972.
11. Graber, T., Vanarsdall, R., Orthodontics Current Principles and Techniques, second edition, 1994, Mosby.
12. Hitchcock, H.P. Orthodontics for Undergraduate, Lea and Febiger, Philadelphia, 1974.
13. Okeson, J.P. Management of TMJ disorders and occlusion, St. Louis, 1993.
14. Proffit, W., Tomas, P., Sinclair, P., Ackerman, J., Tulloch, J.F., Contemporary Orthodontics, second edition, 1993, Mosby.
15. Proffit, W.R. et al. Contemporary Orthodontics, Mosby, St. Louis, 1993.
16. Prof. d-r Mustafa Ulgen, Orthodonti, anomaliler, sefalometri, etiologi. 1st. 2000, Buyume ve gelisim, tani.
17. Salzman, J.A. Practice of Orthodontics, Philadelphia, 1966.
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19. Sperber, GH. Craniofacial Embryology, ed.,Wright, Oxford, 1989.
20. Tweed, C.TJ. Clinical Orthodontics, Mosby, St. Louis, 1966.
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22. Van der Linden, F., Boersman, H. Diagnosis and Treatment Planning in Dentofacial Orthopedics, Quint, 1987, vol. 3.
23. Van der Linden, F.Problems and Procedures in Dentofacial Orthopedics, Quint, 1990, London.
24. Van der Linden, F. Practical Dentofacial Orthopedics.

25. Van der Linden, F. Complex Dentofacial Orthopedics, Orthodontics with Fixed appliances.
26. White, T.C., Gardiner, J.H., and Leighton. B.C. Orthodontics for Dental Students, London, 1967.
27. Bozhkova, Zv., Orthodontic Anomalies, Medicine and Physical Education, 1970.
28. Gesheva, N., B. Nikolov, L. Dekova, Orthodontics, 1978.
29. Gesheva, N., V. Mutafchiev, Prevention of Dentomaxillary Deformities, Medicine and Physical Education, 1981.
30. Dekova, L., V. Apostolova, D. Mladenova, Atlas of Orthodontics, Medicine and Physical Education, 1988.
31. Koev, T., Dentomaxillary Deformities, Medicine and Physical Education, 1973.
32. Mutafchiev, V., Lingual Plate, Sofia, 1997.
33. Mutafchiev, V., V. Krumova, V. Yordanov, Orthodontics, 2000.
34. Uzhumedkene, I., Examination Methods in Orthodontics, Moscow, 1970.
35. Horoshilkina, F., Diagnosis and Functional Treatment of Dentomaxillary Facial Anomalies, Moscow, 1987.
36. Krumova, V., Handbook of Orthodontics for Students, Sofia. Medicine and Physical Education, 2012.
37. Dekova, L., V. Mutafchiev, V. Krumova. Atlas of Orthodontic Prevention, Sofia. Medicine and Physical Education, 1993.
38. Dekova, L. Practical Guide to Orthodontics, Sofia. Medicine and Physical Education, 1992.
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40. Handbook of Orthodontics, Martyn T. Cobourne, Andrew T. DiBiase, 2010
41. Orthodontic - Syllabus for Students, Prof. Vera Krumova, 2014.

9. CONTINUOUS ASSESSMENT

Students are intensively and dynamically loaded during the semester. Continuous assessment is conducted through seminars, tests and colloquium examinations. Students are provided with information and explanations about the results of the seminars. The continuous assessment results are taken into account for the semester's certification by the lecturer.

10. STUDENT'S INDIVIDUAL WORK AND ENGAGEMENT

Each student independently performs the tasks assigned to him/her during the seminars. Supervision is performed by the assistant teaching the seminar to the student group.

11. COOPERATION BETWEEN STUDENTS AND THE TEACHING STAFF

Lecturers and students cooperate during seminars. Every lecturer in the department has reception hours for counseling.

12. EXAMINATIONS

The current assessment grades as per the syllabus for the discipline are given for:

- results of colloquium examinations;
- continuous assessment grade of the student during the semester.

13. STUDENT ASSESSMENT STANDARDS

Student assessment standards must be carefully considered and defined so that they are objective and do not depend on the subjective opinion of the lecturer.

- **Excellent (6)**—Awarded for excellent knowledge of the studied subject matter and good knowledge of the information sources. The student has mastered the main and additional knowledge and skills on the subject excellently. The student presents the studied subject matter accurately and fluently. The student is skillful at using his/her knowledge of the subject matter and has the ability to think independently, make judgments and conclusions.
- **Very good (5)** - Awarded for very good knowledge of the studied subject matter and good knowledge of the information sources. The student displays very good main and additional knowledge and skills on the subject. The student has very good language skills. The student has difficulties in making independent decisions based on sound arguments.
- **Good (4)** - Awarded for good knowledge of the studied subject matter and good understanding of the main and additional knowledge on the subject. The student does not have in-depth insight into the interpretation of the subject matter and cannot make independent decisions based on sound arguments.

- **Average (3)**–Awarded for only basic knowledge of the studied subject matter. The presentation of the studied subject matter is characterized by poor language. The student displays only basic knowledge of solving simple tasks.
- **Poor (2)**–The student does not meet any of the above-stated requirements.

At the beginning of the classes, the students must be made aware of the student assessment standards, the procedures for conducting the continuous assessment and the opportunities for obtaining feedback on their progress during the semester.

14.FINAL ASSESSMENT FORMATION

The final grade is multi-component and includes the grades from

- Continuous assessment
- Practical examination
- Written examination
- Oral examination

If one of the final assessment component grades is Poor (2), then the final grade is Poor (2).

After the examination, the exam materials are kept in the office and the students are given an opportunity to see their graded exam work and the grounds for assessment under the order and procedure set out in clause 13 in this standard. The period in which students are given access to the exam materials and results is within five working days after the exam date.

The present discipline has an Academic Standard to which the students are given access at the beginning of the training.

This requirement is set in accordance with the Law on Higher Education, Art. 56, para. 1, ‘Lecturers are required to develop and publicize in an appropriate manner a description of the lecture course taught by them, including the titles and the sequence of the topics of the curriculum, the recommended literature, the way of forming the final assessment grade and the form of examination of the students’ knowledge and skills’.

Prepared by Head of Department:

/Associate Prof. Dr. S. Krasteva, DM/

The Academic Standard for the discipline was approved by Decision of the Orthodontics Department Board № 5/25.04.2017.

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