



**ALTAMASH INSTITUTE OF DENTAL MEDICINE  
(JINNAH SINDH MEDICAL UNIVERSITY)**

**BDS Fourth Year  
Orthodontics  
Study Guide**

**Introduction:**

Orthodontics is a course given to the fourth year dental students which provides knowledge of basics of growth and development, classification, diagnosis and management of different malocclusion in orthodontics. The course is divided into a theoretical part which includes lectures and practical sessions which provides the required knowledge and skills to perform basic analysis and diagnosis of malocclusions. The dental students will also learn fabrication of various removable appliances used for correction of malocclusions. This course will help students in management of patients presenting with mal-aligned and crooked teeth in clinical settings. This course will help them making treatment plan as per contemporary fixed and removable appliances used in orthodontics

**Outcome:**

By the end of this course, students will be able to manage basic orthodontic problems under direct supervision

**Teaching and learning:**

- Flipped Classroom (FC)
- Interactive lectures (IL)
- Tutorials
  - a. Cased Based Learning (CBL)
  - b. Small Group Discussion (SGD)

**Assessment tools:**

1. Multiple Choice Questions: ( MCQs )
  - One Correct Type
  - One Best Type
2. Mini Clinical Examination (MiniCEX)
3. Observed Structured Clinical Examination (OSCE)



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<b>s.n o.</b>	<b>Topic</b>	<b>Course Objectives: By the end of the course, 3rd year students will be able to:</b>	<b>Teaching method</b>	<b>Assessment Tool</b>
1.	Introduction to Orthodontics	<ul style="list-style-type: none"> <li>• Define the terminologies related to orthodontics.</li> <li>• Discuss the indications, contraindications and aims of various types of orthodontic treatments</li> </ul>	IL  SGD	MCQs
2.	Growth and Development	<ul style="list-style-type: none"> <li>• Describe the variables affecting growth</li> <li>• Explain the prenatal and postnatal craniofacial growth</li> <li>• Describe the methods of studying growth</li> <li>• Discuss various theories of growth</li> <li>• Discuss the development of Temporomandibular joint.</li> </ul>	FC	MCQs
3.	Occlusion	<ul style="list-style-type: none"> <li>• Classify malocclusion.</li> <li>• Explain the clinical features of normal occlusion</li> <li>• Differentiate between occlusion and malocclusion</li> <li>• Describe Andrews Six Keys of occlusion.</li> </ul>	IL  SGD	MCQs
4	Dental Radiology	<ul style="list-style-type: none"> <li>• Describe the roentgen anatomy of teeth, jaws, and TMJ</li> <li>• Describe variations in normal limits and abnormalities</li> </ul>	IL  CBL	MCQs



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		<ul style="list-style-type: none"> <li>• Discuss proper patient positioning while taking the cephalometric radiograph</li> <li>• Explain radiation hazards</li> <li>• Discuss the advantages and indications of CBCT (Cone Beam Computer Tomography)</li> </ul>	IL	
5	Development of Dentition and Occlusion	<ul style="list-style-type: none"> <li>• Discuss the prenatal development of dentition</li> <li>• Explain the features of primary, mixed and permanent dentition periods</li> <li>• Describe Nolla's stages of tooth development</li> <li>• Discuss the dimensional changes in dental arch that occur with growing age</li> <li>• Discuss the variations in development including size, form, number and position of teeth</li> <li>• Describe the various factors affecting development of occlusion.</li> </ul>	IL SGD	MCQ
6	Malocclusion and Etiology of Malocclusion	<ul style="list-style-type: none"> <li>• Classify malocclusion.</li> <li>• Describe various local and hereditary environmental factors and habits that can cause malocclusion</li> </ul>	IL	MCQs



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		<ul style="list-style-type: none"> <li>• Discuss the following syndromes/conditions:               <ul style="list-style-type: none"> <li>○ Treacher-Collins;</li> <li>○ Pierre-Robin Syndrome;</li> <li>○ Ectodermal Dysplasia;</li> <li>○ Down's Syndrome;</li> <li>○ Cleido-cranial Dysplasia;</li> <li>○ Hemifacial Microsomia;</li> <li>○ Achondroplasia.</li> <li>○ Crouzon and Apert Syndrome</li> <li>○ Fetal alcohol syndrome</li> </ul> </li> </ul>	CBL	
7	Preventive and Interceptive Orthodontics	<ul style="list-style-type: none"> <li>• Discuss the management of habits leading to orthodontic problems</li> <li>• Discuss space supervision, maintainers and space regainers</li> <li>• Discuss protocol followed for serial extractions.</li> </ul>	IL CBL	MCQs
8	Bone Metabolism	<ul style="list-style-type: none"> <li>• Describe the normal structures of periodontal ligament and bone</li> <li>• Explain the role of bone in eruption and stabilization</li> <li>• Explain the favorable effects of orthodontic forces</li> <li>• Discuss the factors affecting tooth movement.</li> </ul>	FC	MCQs
9	Biomechanics	<ul style="list-style-type: none"> <li>• Discuss the functions of PDL</li> </ul>	IL	MCQs



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		<ul style="list-style-type: none"> <li>• Discuss the types of wires and alloys used in orthodontics</li> <li>• Discuss the ideal properties of orthodontic wires</li> <li>• Compare different types of alloys used in orthodontic brackets and wires.</li> <li>• Discuss the skeletal and deleterious effects of orthodontic forces</li> </ul>	SGD	
10	Anchorage, Retention, Relapse and Stability	<ul style="list-style-type: none"> <li>• Describe the various types of anchorage, retention and relapse</li> <li>• Discuss occlusal stability and factors related to retention</li> <li>• Discuss various strategies of management of patients during and after orthodontic treatment</li> </ul>	IL	MCQS
11	Removable Appliance	<ul style="list-style-type: none"> <li>• Discuss the various types and indications of various intra- and extra-oral appliances for tooth movement.</li> </ul>	CBL	MCQs
12	Growth Modification	<ul style="list-style-type: none"> <li>• Classify removable functional appliances.</li> <li>• Describe class II and Class III functional appliances</li> <li>• Discuss Concepts, indications, drawbacks,</li> </ul>	IL CBL	MCQs



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		<p>components and accessories of growth modification appliances.</p> <ul style="list-style-type: none"> <li>• Discuss the biomechanics of fixed and removable growth modification appliances (Expanders, Facemask and chin cup)</li> </ul>		
13	Fixed Appliances	<ul style="list-style-type: none"> <li>• Discuss the background of different fixed appliances systems.</li> <li>• Explain the indications, draw backs, components and accessories of fixed appliances.</li> <li>• Describe various types of wires and brackets used in orthodontics.</li> <li>• Describe various bonding and banding materials</li> <li>• Discuss orthodontic emergencies and their management (use of wax, sliding of wire, poking wire).</li> </ul>	IL SGD	MCQs
14	Treatment Planning	<ul style="list-style-type: none"> <li>• Discuss the following: <ul style="list-style-type: none"> <li>○ Non-skeletal problems including Class I malocclusion; Crowding, Spacing, Cross bite, Open bite, and Deep bite</li> </ul> </li> </ul>	IL CBL	MCQs



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		<ul style="list-style-type: none"> <li>○ Skeletal problems Class II Division 1 and Division 2</li> <li>○ Class III</li> <li>○ Extractions in Orthodontics</li> <li>● Discuss the adjunctive treatment goals and principles for the management of malocclusion</li> </ul>		
15	Surgical Orthodontics	<ul style="list-style-type: none"> <li>● Describe the principles of orthognathic surgery;</li> <li>● Discuss the surgical treatment options for Class II and Class III malocclusions</li> <li>● Describe the indication and contraindications of orthognathic surgeries</li> </ul>	IL CBL	MCQs
16	Cleft Lip and Palate	<ul style="list-style-type: none"> <li>● Discuss the etiology, clinical features, general and orthodontic management of cleft lip and palate</li> <li>● Describe the referral pathways</li> </ul>	IL CBL	MCQs
17	Adult Orthodontics and Periodontal Considerations	<ul style="list-style-type: none"> <li>● Discuss the etiology and clinical features of periodontal diseases.</li> <li>● Classify periodontal diseases.</li> <li>● Discuss the role of orthodontists in the management of periodontal</li> </ul>	IL CBL	MCQ



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		diseases.		
<b>CLINICAL SKILLS</b>			<b>Teaching Methods</b>	<b>Assessment tools</b>
By the end of the session students will be able to:				
1	Dental Radiology	<ul style="list-style-type: none"> <li>Differentiate between various intra-oral and extra-oral radiographs</li> <li>Interpret different radiographic films</li> </ul>	OPD Demonstration	MiniCEx OSCE
2	Diagnostic Aids in Orthodontics	<ul style="list-style-type: none"> <li>Obtain history of patients presenting to the OPD complaining of orthodontic problems following the recommended guidelines</li> <li>Examine intra- and extra-orally patients presenting to the OPD complaining of orthodontic problems following the recommended guidelines</li> <li>Trace cephalograms of at least 05 patients complaining of orthodontic problems following the recommended steps</li> <li>Analyze the traced cephalograms of at least 05 patients complaining of orthodontic problems following the recommended steps; Cephalometric analysis, Sagittal analysis,</li> </ul>	Lab demo	OSCE





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		<p>Vertical analysis, Dental analysis, Soft tissue analysis</p> <ul style="list-style-type: none"><li>• Perform cast, Bolton's and mixed dentition analysis of at least 03 patients complaining of orthodontic problems following the recommended steps</li><li>• Develop a list of orthodontic problems following history, examination and analyses</li><li>• Interpret cephalometric radiographs of at least 05 patients complaining of orthodontic problems</li><li>• Interpret OPGs of at least 05 patients complaining of orthodontic problems</li><li>• Identify relevant anatomical structures and landmarks on OPG, Lateral cephalograms</li><li>• Justify the type of radiographic investigation in a variety of patients presenting with orthodontic problems.</li><li>• Justify the type of fixed appliance therapy and retention plan for at least 01 patient presenting with</li></ul>		OSCE
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		<p>orthodontic problems</p> <ul style="list-style-type: none"><li>• Document the correct treatment plan for patients presenting with orthodontic problems.</li><li>• Refer patients presenting with orthodontic problems requiring complex treatment following the recommended guidelines.</li></ul>		
3	Procedures	<ul style="list-style-type: none"><li>• Fabricate at least 5 of each of the following:<ul style="list-style-type: none"><li>○ Adams clasp</li><li>○ Labial Bow</li><li>○ Canine retractor</li><li>○ Cantilever</li><li>○ Z spring</li><li>○ Hawley's Retainer</li></ul></li><li>• Perform bracket and wire placement and elastomeric ligature on plaster models.</li><li>• Identify orthodontic materials and instruments</li><li>• Identify the different types of wires used in orthodontics</li></ul>	Lab demo	OSCE



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**Reading Sources:**

**Text Books:**

PROFITT Contemporary Orthodontics .latest EDITION

**Internet resources:** With easy excess to digital library students will use internet resources with added time flexibility to enrich and update their knowledge and its application.

**Library:** It provides wealth of resources, space to study alone or in a group. It also provide world of books to discover and borrow.

**Assessment Criteria:**

**Knowledge:** MCQs (Multiple Choice Questions) are used to asses objectives covered in each module.

- A MCQ has a statement or clinical scenario followed by four options (likely answer).
- Students after reading the statement/scenario select ONE, the most appropriate response from the given list of options.
- Correct answer carries one mark, and incorrect 'zero mark'. There is no negative marking.
- Students mark their responses on an answer sheet provided by examination department.

**Skills:**

- OSCE: Objective Structured Clinical Examination:
- Each student will be assessed on the same content and have same time to complete the task.
- Comprised of 12-25 stations.
- Each station may assess a practical tasks include practical skills and application of knowledge
- Stations are observed, interactive, application of knowledge based and rest.
- In Observed and Interactive Stations these will be assessed by internal or external examiners through structured viva or a task.



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- Application of knowledge Stations: it will be static stations in which there will be pictures, clinical scenarios with related questions for students to answer on the provided answer copy.
- Rests: It is a station where there is no task given and in this time student can organize his/her thoughts.

**AIDM Internal Assessment Policy**

Students will be assessed to determine achievement of learning objectives through the following:

- Midterm Examination will be scheduled on completion of half of the course and OPD rotations
- Mock Examination will be scheduled on completion of whole course and OPD rotations
- The method of examination comprises theory exam which includes MCQs, and practical examination by OSCE (Objective Structured Clinical Examination).
- Student's behaviors and attitudes will be observed during all academic activities.

**Annual Examination:**

- Marks of both internal assessments will constitute 20% weightage as per JSMU policy.
- University Annual examination carries 90% marks. Theory exam will be based on MCQs and Clinical / Professional /communication skills will be assessed by OSCE.

**Attempts:** There are 2 attempts in the fourth professional examination only. 2<sup>nd</sup> attempt is the supplementary examination which if not passed student has to repeat the year.

**Course Evaluation:**

- Pass/fail ratio of continuous and summative assessments will be evaluated.
- 75% attendance is mandatory to be eligible for annual professional examination
- Feedback will be taken
  - Regarding course from students and faculty



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- Student feedback regarding faculty
- Faculty feedback of students

**Teaching Faculty:**

**Prof. Dr. Ambreen Afzal**

Dean Academics

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