



QUETTA COLLEGE OF DENTISTRY
DEPARTMENT OF ORTHODONTICS
STUDY GUIDE (2028-2029)

YEAR	BDS 4 TH YEAR
BLOCK	I, II & III
SUBJECT	ORTHODONTICS



Contents

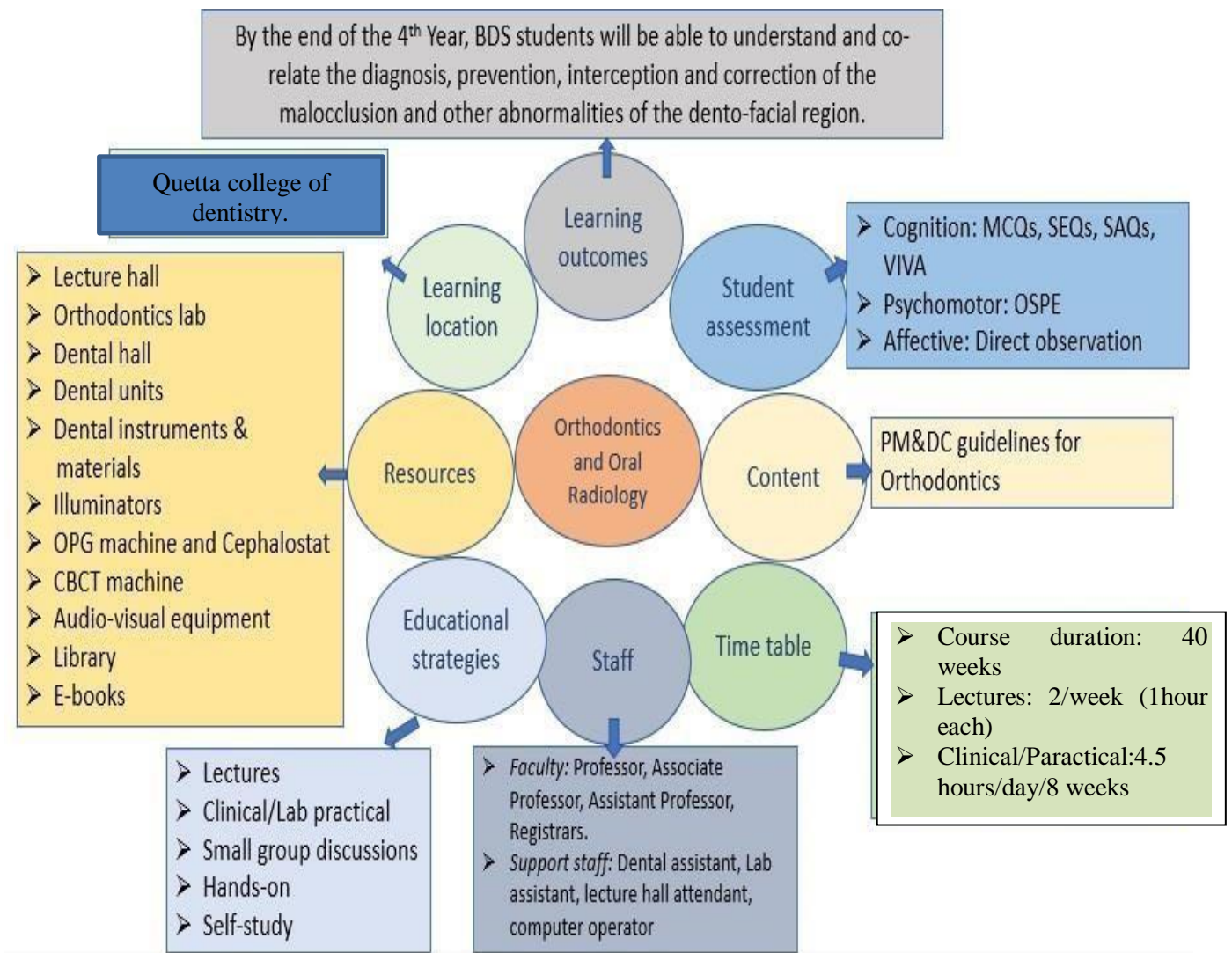
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INTRODUCTION TO ORTHODONTICS

The word “Orthodontics” is derived from Greek words *orthos* meaning correct and *odontos* meaning teeth. The subject of Orthodontics is a branch of dentistry that is concerned with the diagnosis, prevention, interception and correction of the malocclusion and other abnormalities of the dento-facial region.

Curricular map of Orthodontics





Resources:

- Teaching resources
- Supporting staff
- Infrastructure resources

Teaching resources

Sr. #.	Faculty Name	Designation as per PM & DC certificate	Qualification
1	Prof. Dr.	Professor	BDS, FCPS (Orthodontics)
2	Dr. Sohaib	Associate Professor	BDS, FCPS, (Orthodontics)
3	Dr.	Assistant Professor	BDS, FCPS (Orthodontics)
4	Dr. Sumbal Hayat	Senior Registrar	BDS, FCPS (Orthodontics)
5	Dr. Farhan Yahya	Registrar	BDS
6	Dr. Rabia Shafique	Registrar	BDS
7	Dr. Hamda Zafar	Registrar	BDS



Supporting Staff

Orthodontics and Oral Radiology Department		
1		Computer Operator
2		Sterilization Assistant
3		Dental Surgery Assistant
4		Dental Surgery Assistant
5		Dental Surgery Assistant
6		Dental Surgery Assistant
7		Dental Surgery Assistant
8		Dental Technician
9		Ward Boy/ DSA
10		Laboratory Attendant
11		Peon
12		Radiographer
13		Radiology Assistant
14		Radiology Assistant
15		Radiology Assistant



Infrastructure resources

Sr. #.	Infrastructure Resources	Quantity
1	Operating Halls	1
2	Dental Units	12
3	Orthodontics Dental Laboratory/Ceph Room	1
4	Dental Stools <ul style="list-style-type: none">• Operating Hall• Orthodontics Dental Laboratory/Ceph Room	10 24
5	Illuminators	15
6	OPG Machine and Cephalostat	2
7	CBCT machine	1
8	Reception	1
9	Mini Library	1
10	Staff Room	1
11	Dental Stores	2
12	Model Room	1
13	Dental instruments and materials	



TEACHING AND LEARNING STRATEGIES

Multiple educational methods will be used comprising of self-study, interactive lectures, group discussions, practical and manual dexterity skill sessions.

(i) Methods for achieving cognitive objectives

- Interactive lectures using audio visual aids on power point presentation
- Group discussions in form of large group and small group
- Hands on demonstrations
- Tutorials
- Collaborative learning
- Self-study and reading from learning resources

(ii) Methods for achieving psychomotor objectives

- Diagnosis and treatment planning
- Patient handling
- Clinical skills

(iii) Methods for achieving affective objectives

- Interaction with peers, group members, teachers, support staff etc.
- Group discussions (small and large)
- Oral presentations by students



LEARNING METHODOLOGIES

The following teaching / learning methods are used to promote better understanding:

- Interactive Lectures
- Clinic visits
- Small Group Discussion
- Case- Based Learning
- Clinical rotations (CR)
- Skills session
- E- Learning
- Self- Directed Study

INTERACTIVE LECTURES

In large group, the lecturer introduces a topic or common clinical conditions and explains the underlying phenomena through questions, pictures, videos of patients, interviews, exercise etc. students are actively involved in the learning process.

CLINICAL VISITS:

In small groups, students observe patients with signs and symptoms in clinical settings. This helps students to relate knowledge of basic and clinical science of the relevant module.

SMALL GROUP DISCUSSION (SGD)

This format helps students to clarify concepts acquire skills or attitudes. Sessions are structured with the help of specific exercise such as patient case, interviews or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

CASE- BASED LEARNING

A small group discussion format where learning is focused around a series of questions based on a clinical scenario. Students, discuss and answer the questions applying relevant knowledge gained in clinical and basic health sciences during the module.

CLINICAL ROTATIONS (CR)

Clinical rotations for clinical subjects like Operative Dentistry, Orthodontics, Prosthodontics and Oral Surgery are scheduled for student learning.

SKILLS SESSION

Skills relevant to respective module are observed and practiced where applicable in skills laboratory.

SELF DIRECTED STUDY

Students assume responsibilities of their own learning through individual study, sharing and discussing with peer, seeking information from Learning Resource center, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self- study.

E- LEARNING

E-L earning is a strategy by which learning occurs through the utilization of electronic media, typically the Internet. The basic aspects of medical professionalism and ethics will be addressed through and E- Learning course.



CURRICULUM IMPLEMENTATION

Curriculum implementation refers to putting into practice the official document including course content, objectives, learning and teaching strategies. Implementation process helps the learner to achieve knowledge, skills and attitudes required of the learning tasks. Learners are a pertinent component of the implementation process. Implementation occurs when the learner achieves the intended learning experiences, knowledge, ideas, skills and attitudes which are aimed to make the learner an effective part of the society. Curriculum implementation also refers to the stage at which curriculum is put into effect. There has to be an implementing agent as well. Teacher is an important part of this process and implementation of the curriculum is the way the teacher selects and utilizes various components of the curriculum. Implementation occurs when the teacher's formulated course content, teacher's personality and teaching and learning environment interact with the learners. Therefore, curriculum implementation is how the officially planned course of study is translated and reflected by the teacher into schemes of work, lesson plans, syllabus and resources are effectively transferred to the learners. Curriculum implementation can be affected by certain factors such as teachers, learners, learning environment, resource materials and facilities, culture and ideology, instructional supervision and assessments.

Personnel involved in teaching and facilitation

- (i) **Lectures delivery by:**
 - a. Prof. (Professor)
 - b. Dr. Sohaib (Associate Professor)
 - c. Dr. (Assistant Professor)
 - d. Dr. Sumbal Hayat (Senior Registrar)

- (ii) **Registrars for clinics/practical and small group discussion sessions:**
 - a. Dr. Sumbal Hayat (Senior Registrar)
 - b. Dr. Farhan Yahya (Registrar)
 - c. Dr. Rabia Shafique (Registrar)
 - d. Dr. Hamda Zafar (Registrar)

- (iii) **Support staff:**
 - a. Peon: 1
 - b. Dental surgery assistants: 3
 - c. Sterilization assistant: 1
 - d. Dental technician: 1
 - e. Laboratory attendant: 1
 - f. Radiographer: 1
 - g. Radiology assistants: 2

- (iv) **Computer assistant:** 1 as nominated by the college



Time frame:

Course duration:

- Lectures: 40 weeks
- Clinical rotations: 7-8 weeks per rotation

Lectures:

- Tuesday (8:30 to 9:30 am)
- Thursday (8:30 to 9:30 am)

Practical/ clinical visits:

- Monday – Thursday (11:00 am to 3:30 pm)
- Friday (11:00 to 3:30 pm) with 1:15 pm to 1:45 pm Jumma break

Self-study:

- 10 hours during the course



Table of specification for Teaching, Learning Objectives and Assessment

At the end of the year students will be able to know:

TOPICS AND OBJECTIVES	FACULTY	Learning Domain (CPA)	LEARNING STRATEGY	ASSESSMENT					
				Clinical	Viva	OSPE	NUMS MCQs	NUMS SEQs	Weight age
Orthodontics									
A. INTRODUCTION TO ORTHODONTICS Time Allocation: Lectures: 1 hour				X	✓	X	03	1	9%
1. Introduction to the Orthodontics									
<ul style="list-style-type: none"> Definition of Orthodontics and related terminology i.e. overjet, open bite, deep bite, incisor irregularity, etc. 	Dr.Sohaib	C	Interactive lecture						
<ul style="list-style-type: none"> Discussion of the branches of Orthodontics and their role. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the aim and need of seeking orthodontic treatment (IOTN), associated terminologies, background and paradigm. 		C	Interactive lecture						
2. Epidemiology									



<ul style="list-style-type: none"> Elaborate and describe the epidemiology of malocclusion including the incidence and prevalence. 	Dr.Sumbal Hayat	C	Interactive lecture						
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B. GROWTH AND DEVELOPMENT Time Allocation: Lectures: 10 hours				X	✓	X	03	1	9%
3. Growth and Development									
<ul style="list-style-type: none"> Definition of important terms i.e. growth, pattern, variability and timing. 	Dr. Sumbal Hayat	C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the methods of growth measurement and experimental approaches. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe the genetic influence on growth. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discussion of the theories of growth. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss and differentiate between growth sites and centers. 		C	Interactive lecture						



<ul style="list-style-type: none"> Describe growth assessment parameters, cervical maturation stages, pre- & post-natal growth of cranial vault and cranial base. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe pre-natal and post-natal growth of maxilla, mandible and 		C	Interactive lecture						
<p>naso-maxillary complex.</p>									
<ul style="list-style-type: none"> Discussion of jaw rotations. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discussion of the pre-natal and post-natal growth of the palate. 		C	Interactive lecture						
<ul style="list-style-type: none"> TMJ growth and development. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe the changes in face form and profile. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe Developmental Abnormalities and Learning and the development of behavior. 		C	Interactive lecture						



<ul style="list-style-type: none"> Discuss the psychological and social impact of abnormal growth and malocclusion. 		C	Interactive lecture						
4. Development of Dentition									
<ul style="list-style-type: none"> Definition of primary, mixed and permanent dentition. Explain the development of teeth and eruption. 	Dr.Sohaib	C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the prenatal development and describe different dimensional 		C	Interactive lecture						
changes in the dental arch during different dentition periods.									
<ul style="list-style-type: none"> Describe the variation in the development including size, shape, form number and position of teeth and factors effecting the development. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the different Nolla's stages. 		CPA	Interactive lecture/Practical						
C. OCCLUSION Time Allocation: Lectures: 2 hours				X	✓	✓	06	1	12%
5. Occlusion									



<ul style="list-style-type: none"> Define normal and abnormal occlusion, introduction and definition of ideal occlusion. 	Dr.Sumbal Hayat	CP	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Discussion of the Andrew's six keys of occlusion, CO-CR shift and canine guided group function. 		CP	Interactive lecture/Small group discussion						
D. DIAGNOSTIC AIDS IN ORTHODOONTICS				✓	✓	✓	04	1	10%
Time Allocation: Lectures: 8 hours									
6. Diagnostic aids in Orthodontics									
<ul style="list-style-type: none"> Diagnosis of malocclusion: Discuss the procedure of History taking. 	Dr.Sohaib	CPA	Interactive lecture/Practical/Case-based discussion						
<ul style="list-style-type: none"> Extra-oral and Intra-oral 		CPA	Interactive lecture/Practical/Case-based discussion						
examination, examination of teeth, appraisal of soft tissues and functional analysis.			al/Case-based discussion						
<ul style="list-style-type: none"> Discussion of the necessary investigations, maintain diagnostic record, analyze and interpret records, and outline management protocol. 		CPA	Interactive lecture/Practical/Case-based discussion						



<ul style="list-style-type: none"> • Discussion of communication with patient involving probable prognosis and financial involvement. 		CPA	Interactive lecture/case-based discussion						
<ul style="list-style-type: none"> • Describe the Diagnostic techniques: Impression taking and plaster model, radiographs, intra-oral and facial photographs. 		CPA	Interactive lecture/Practical/Case-based discussion						
<ul style="list-style-type: none"> • Describe the analysis of study models to assess tooth jaw discrepancy: arch perimeter, arch length, arch width, space analysis and Bolton's analysis. 		CPA	Interactive lecture/Practical/Case-based discussion						
<ul style="list-style-type: none"> • Describe cephalometric analysis, 		CPA	Interactive lecture/Practical/Case-based discussion						
<p>anthropological sources and development of cephalometrics, discuss the objectives of cephalometric tracings.</p>			al/Case-based discussion						
<ul style="list-style-type: none"> • Describe Orthopantomograms and their importance in Orthodontic treatment. 		CPA	Interactive lecture/Case-based discussion						



<ul style="list-style-type: none"> Discuss additional radiographs. 		CPA	Interactive lecture/Case-based discussion						
E. MALOCCLUSION Time Allocation: Lectures: 11 hours				X	✓	X	06	1	12%
7. Etiology of Malocclusion									
<ul style="list-style-type: none"> Definition of malocclusion and discuss various terminologies: <ol style="list-style-type: none"> Malformation Deformity Teratogens. 	Dr. Sumbal Hayat	C	Interactive lecture						
<ul style="list-style-type: none"> Discussion of the etiological factors: <ol style="list-style-type: none"> Local factors (tooth size and number). General factors 			C	Interactive lecture					
(respiratory problems, adenoids, genetics and speech).									
8. Treatment Modalities									



<ul style="list-style-type: none"> Discuss the indications and contraindications Class I malocclusion- Crowding: Diagnosis, planning and treatment of the malocclusion using a range of appliances. 	Dr. Sohaib	C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Discussion of the methods of treatment, types of Orthodontic appliances and tooth-jaw discrepancy. 		C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Differentiation between extraction and non-extraction treatment, a criterion and choice of teeth for extraction, contraindication for extraction, and extraction with Orthodontic treatment. 		C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Class I malocclusion- Spacing: Diagnosis, planning and 		C	Interactive lecture/Small group discussion						
<p>treatment of the malocclusion using a range of appliances.</p>									
<ul style="list-style-type: none"> Discussion of the methods of treatment, types of Orthodontic appliances and tooth-jaw discrepancy. 		C	Interactive lecture/Small group discussion						



<ul style="list-style-type: none"> Class I malocclusion- Cross bite: Diagnosis, planning and treatment of the malocclusion using a range of appliances. 	Dr. Sumbal Hayat	C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Discussion of the methods of treatment, types of Orthodontic appliances and tooth-jaw discrepancy. 		C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Differentiation between extraction and non-extraction treatment, a criterion and choice of teeth for extraction, contraindication for extraction, and extraction with Orthodontic treatment. 		C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Class I malocclusion- Open bite: Diagnosis, planning and treatment of the malocclusion using a range of 	Dr. Sumbal Hayat	C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> appliances. Discussion of the methods of treatment, types of Orthodontic appliances and tooth-jaw discrepancy. 									



<ul style="list-style-type: none"> Differentiation between extraction and non-extraction treatment, a criterion and choice of teeth for extraction, contraindication for extraction, and extraction with Orthodontic treatment. 		C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Class I malocclusion- Deep bite: Diagnosis, planning and treatment of the malocclusion using a range of appliances. Discussion of the methods of treatment, types of Orthodontic appliances and tooth-jaw discrepancy. 	Dr. Sohaib	C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Differentiation between extraction and non-extraction treatment, a criterion and choice of teeth for extraction, contraindication for extraction, and extraction with 		C	Interactive lecture/Small group discussion						
Orthodontic treatment.									



<ul style="list-style-type: none"> Class II malocclusion: Diagnosis, planning and treatment of the malocclusion using a range of appliances i.e. Removable, functional and fixed appliances. 	Dr. Sohaib	C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Discussion of the methods of treatment, types of Orthodontic appliances and tooth-jaw discrepancy. 		C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Differentiation between extraction and non-extraction treatment, a criterion and choice of teeth for extraction, contraindication for extraction, and extraction with Orthodontic treatment. 		C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Class III malocclusion: Diagnosis, planning and treatment of the malocclusion using a range of appliances i.e. Removable, functional and fixed appliances. 	Dr.Sohaib	C	Interactive lecture/Small group discussion						
<ul style="list-style-type: none"> Discussion of the methods of 		C	Interactive lecture/Small						



treatment, types of Orthodontic appliances and tooth-jaw discrepancy.			group discussion						
<ul style="list-style-type: none"> Differentiation between extraction and non-extraction treatment, a criterion and choice of teeth for extraction, contraindication for extraction, and extraction with Orthodontic treatment. 		C	Interactive lecture/Small group discussion						
F. PROTOCOLS DURING MIXED DENTITION Time Allocation: Lectures: 5 hours				X	✓	X	06	1	12%
9. Preventive and Interceptive Orthodontics									
<ul style="list-style-type: none"> Describe the Protocols for relieving mixed dentition crowding. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss: <ol style="list-style-type: none"> Space regaining Space supervision Serial extraction procedures. 	Dr.Sumbal Hayat	C	Interactive lecture						
<ul style="list-style-type: none"> Describe the diagnosis and management of Cross bite. 		C	Interactive lecture						



<ul style="list-style-type: none"> Describe the diagnosis and management of habits. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss growth modification, various appliances used in detail. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the preventive Orthodontics and methods. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the interceptive Orthodontics and methods. 		C	Interactive lecture						
G. ORTHODONTIC APPLIANCES AND BIOMECHANICS Time Allocation: Lectures: 11 hours				✓	✓	✓	06	1	13%
10. Biomechanics									
<ul style="list-style-type: none"> Discussion of the concept, advantages and disadvantages and limitations. 	Dr.Sohaib	C	Interactive lecture						
<ul style="list-style-type: none"> Description of the types of movement and types of forces Wires and alloys used in Orthodontics. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe the ideal properties and comparison of different alloys. 		C	Interactive lecture						
11. Material instruments and techniques used in Orthodontics									
<ul style="list-style-type: none"> Discuss different materials, instruments and 	Dr.Sohaib	CPA	Interactive lecture/Practical						



techniques used in Orthodontics.									
<ul style="list-style-type: none"> Describe the properties of Stainless Steel, Beta-Titanium and Nickel-Titanium alloys. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Describe the principal and method of wire bending (exercise) 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Definition of soldering. 		C	Interactive lecture						
<ul style="list-style-type: none"> Introduction, composition and properties of silver solder and fluxes, soldering and flame. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe soldering method and procedure. 		C	Interactive lecture						
<ul style="list-style-type: none"> Define welding. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the principles and mechanism of spot welding. 		C	Interactive lecture						
12. Orthodontic Appliances									
<ul style="list-style-type: none"> Removable Appliances: Definition of removable appliances. 	Dr.Sohaib	C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the basic requirements of an orthodontic appliance and components of 		C	Interactive lecture						



removable appliances.									
<ul style="list-style-type: none"> Describe general principles of designing and fabrication of removable appliances. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the different types of appliances for different tooth movements i.e. labiolingual movements, expansion and contraction of arches. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Construction of Hawley, Begg retainer and bite planes 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Selective case presentation and general wire bending exercise with discussion of the design and construction of different springs and clasps. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Trimming and polishing of removable appliances. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Insertion and advice for the patients. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Explain the follow-up and care during the treatment. 		C	Interactive lecture						



<ul style="list-style-type: none"> • Functional Appliances: Describe the orthopaedic force and its principles. 		C	Interactive lecture						
<ul style="list-style-type: none"> • Discuss different Myo-functional appliances and describe their indications and contra indications. 		C	Interactive lecture						
<ul style="list-style-type: none"> • Describe the clinical and laboratory steps in construction of Class II and Class II activator (Anderson/ monoblock type) and Twin block. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> • Discuss the adjustment of the appliances after insertion in oral cavity and care during treatment. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> • Fixed Appliances: Describe the principles of fixed appliances, identification of parts of fixed appliances and discussion of the fixed appliance system currently used. 		C	Interactive lecture						
<ul style="list-style-type: none"> • Discuss the advantages and disadvantages 		C	Interactive lecture						



of fixed appliances									
<ul style="list-style-type: none"> Describe the technique and training of fixed appliances. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the use of multi-loop used in fixed appliances. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Upper and lower ideal arch formation, offset and inset bends, 1st, 2nd and 3rd order bends, and toe-in and tip-back bends. 		CPA	Interactive lecture/Practical						
<ul style="list-style-type: none"> Describe molar band formation and welding of molar tube in the band with ideal position with cementing of the band. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss weldable bracket positioning, direct bonding technique of mesh bracket, and adjustment of arch wire and follow up. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe the stages of treatment progression by fixed appliances. 		CPA	Interactive lecture/Practical						
13. Anchorage									
<ul style="list-style-type: none"> Definition of anchorage. 	Prof. Dr.	C	Interactive lecture						



<ul style="list-style-type: none"> Discuss different types of anchorage, preparation and assessment of anchorage planning. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe how to plan anchorage according to needs i.e. mild, moderate and maximum. 		C	Interactive lecture						
<ul style="list-style-type: none"> Methods to enhance anchorage value, Extra-oral and intra-oral methods i.e. headgear usage, chin cup, Nance, etc. 		C	Interactive lecture						
H. METABOLIC BASIS									
Time Allocation: Lectures: 4 hours				X	✓	X	04	1	10%
14. Bone Metabolism									
<ul style="list-style-type: none"> Description of different tissue changes. 	Dr.Sumbal Hayat	C	Interactive lecture						
<ul style="list-style-type: none"> Learn the difference between physiologic movement and orthodontic movement. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe pathophysiological change of tissue, histopathological changes at the pressure and tension area. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe the types of tooth movement, explain the 		C	Interactive lecture						



effect of normal and excessive forces. Explain tissue changes with different types of appliances, including myo-functional appliances.									
<ul style="list-style-type: none"> Explain biological basis of Orthodontic therapy and effects of drugs. Describe favorable and unfavorable incidence of tooth movement, role of bone in eruption and stabilization. Discuss deleterious effects of orthodontic tooth movement on periodontium 		C	Interactive lecture						
I. MULTIDISCIPLINARY ORTHODONTICS Time Allocation: Lectures: 6 hours				X	✓	X	04	0-1	4%
15. Cleft Lip and Palate									
<ul style="list-style-type: none"> Describe the etiological factors. 	Dr.Sohaib	C	Interactive lecture						
<ul style="list-style-type: none"> Role of Orthodontist in the treatment procedures at different age groups. 		C	Interactive lecture						
16. Orthognathic Surgery									
<ul style="list-style-type: none"> Discussion of the indications of Orthognathic surgery and 	Dr. Sohaib	C	Interactive lecture						



stages of Orthognathic surgery.									
<ul style="list-style-type: none"> Describe pre-surgical and post-surgical Oral-Orthopedic and Orthodontic procedure. 		C	Interactive lecture						
17. Adjunctive and Multi-disciplinary Orthodontics									
<ul style="list-style-type: none"> Discussion of adjunctive treatment goals and principles. 	Dr.Sohaib	C	Interactive lecture						
<ul style="list-style-type: none"> Describe Adult Orthodontics, appliance and technique for Adult Orthodontics and Multi-disciplinary treatment procedures. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe various adjunctive and types of surgical procedures. 		C	Interactive lecture						
<ul style="list-style-type: none"> Pre-restorative Orthodontic procedures and preventive periodontics. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe TMJ Dysfunction. 	Dr.Sohaib	C	Interactive lecture						
<ul style="list-style-type: none"> Discussion of the types of TMPDS and the treatment modalities. 		C	Interactive lecture						
J. RETENTION PROTOCOLS Time Allocation: Lectures: 2 hours				X	✓	X	03	0-1	9%



18. Retention and Relapse									
<ul style="list-style-type: none"> Define retention and relapse. 	Dr.Sumbal Hayat	C	Interactive lecture						
<ul style="list-style-type: none"> Discuss different causes and factors of relapse. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the role of various types of retainer's role in periodontal tissues and allied causes of relapse. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe the concept of retention and relapse. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss occlusal stability and its management. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the evaluation of relapse after orthodontic treatment. 		C	Interactive lecture						
<ul style="list-style-type: none"> Describe different means of retention after correction of different types of malocclusions. 		C	Interactive lecture						
<ul style="list-style-type: none"> Discuss the theorems of retention and relapse. 		C	Interactive lecture						



ORTHODONTICS PRACTICAL AND CLINICAL COMPONENT

Sr. No	Objectives	Faculty	Time Allocation
1	History and Clinical Examination: <ul style="list-style-type: none"> • Clinical evaluation of the patient • Impression Taking • Bite Registration 	Dr. Hamda Zafar	22 hours
2	Study model analysis: <ul style="list-style-type: none"> • Cast Analysis • ALD • Bolton Analysis • Mixed Dentition Analysis 	Dr. Farhan Yahya	22 hours
3	Wire Bending Exercise: <ul style="list-style-type: none"> • Construction of Adam's Crib • Construction of Labial-Bow • Construction of Palatal Finger Spring • Construction of "Z" Spring • Construction of Buccal Canine Retractor 	Dr. Rabia Shafique	46 hours
4	Construction of Hawley's Retainer	Dr. Rabia Shafique	22 hours



5	<p>Cephalometric analysis:</p> <ul style="list-style-type: none"> • <u>Sagittal Analysis:</u> <SNA, <SNB, <ANB, AO-BO Distance, Anterior Cranial Base Length & Mandibular Corpus Length. • <u>Vertical Analysis:</u> <SN Mandibular Plane, <MMA, <Y axis, Sum of Posterior Angles & Posterior Face 	Dr. Farhan Yahya	46 hours
	<p>Height: Anterior Face Height.</p> <ul style="list-style-type: none"> • <u>Dental Analysis:</u> <UI-SN, <UI-PP, <IMPA, < IIA & Hold away Ratio. • <u>Soft Tissue Analysis:</u> Distance of Upper Lip to E Line and S Line, Distance of Lower Lip to E Line and S Line & <Nasolabial 		
6	Observation of Fixed Appliances Cases	Dr. Hamda Zafar	22 hours



LEARNING OUTCOMES

Annex-A

TOPIC/THEME	Learning outcomes	LEARNING OBJECTIVES		INSTRUCTIONAL STRATEGIES	%
		At the end of each module, student will be able to:			
		Knowledge	Skills		
1. INTRODUCTION TO ORTHODONTICS					
Introduction To Orthodontics	Definition, Branches of orthodontics and their role, Aim and need of orthodontic treatment (IOTN), Terminologies, Background and Paradigm	Identify the branches of orthodontics and evaluate need and severity of orthodontic Problems	Apply pertinent knowledge on patients	Lecture/ CBL	
Epidemiology	Describe the epidemiology of malocclusion including incidence and prevalence	<ul style="list-style-type: none"> • Describe different research design • Interpret various terms used to describe orthodontic problems 		Lecture/ CBL	
2. GROWTH & DEVELOPMENT					
Growth & Development	Definition, Theories, Sites and Centers, Pre & post-natal growth of maxilla, mandible, Naso-maxillary complex, palate, TMJ growth and development. Growth assessment parameters, Cervical maturation stages, Describe changes in face form and profile, Developmental Abnormalities, Psychological and social impact of abnormal growth and malocclusion	<ul style="list-style-type: none"> • Understand the concept of normal and abnormal pattern of growth and development of craniofacial complex • Understand the malocclusion process as a deviation from normal growth 		Lecture/ CBL	
Development of dentition	Definition of primary, mixed and permanent dentition. Development of teeth and eruption. Dimensional changes in the dental arches during different dentition periods,	Understand the concept of normal and abnormal pattern of growth and development of Dentition Evaluate the deviation from normal to		Lecture/ CBL/pbl	



	<p>prenatal development, variation in development including size, form, number and position of teeth and factors effecting development.</p> <p>Nolla's Stages.</p>	<p>abnormal dental development/ malocclusion</p>			
3. DIAGNOSTIC AIDS IN ORTHODONTICS					
Diagnosis of Malocclusion	<p>Obtain comprehensive history, Extra-oral and Intra-oral examination, Examination of teeth, Appraisal of soft tissue, Functional analysis, Plan the necessary investigation, maintain appropriate diagnostic record, Analyze and interpret the records, Outline the management protocol, Communicate with the patient informing the probable prognosis and financial involvement)</p>	<ul style="list-style-type: none"> • Formulate a comprehensive diagnosis • Analyze the diagnostic records 	Evaluate the patient clinically	Lecture/ CBL/PBL	
Diagnostic Techniques	<p>(Obtain impression and plaster model, Technical procedure for impression and plaster model, Analysis of the study model to assess tooth-jaw discrepancy: Arch perimeter, arch length, arch width, Intra-oral radiograph, Intra-oral and facial photograph, Define cephalometry, Anthropological sources and development of cephalometrics, Objectives of cephalometric tracings. Cephalometric Landmarks- Cranial, Maxillary and</p>			Lectures/CBL/ PBL	



	Mandibular, Cephalometric Analysis- Dental, Skeletal and Skeletal-Dental Analysis, Orthopantomogram X-Ray and importance of it in Orthodontic Treatment)				
Dental radiology	Roentgen anatomy of teeth, jaws and Tmj joints, Variations within normal limits, and abnormalities, Different types of X ray machines, Variation of X ray films (extra oral, intra oral, bite wing and occlusal), indication and use of dental radiography, Interpretation of films and Radiation hazards.	Define and recognize radiographs	Able to interpret simple radiological finding of orthodontic problems	lectures	
4. OCCLUSION					
Occlusion	Define normal and abnormal occlusion, Ideal occlusion (introduction, definition) Andrew's six keys of occlusion, CO-CR and canine guided group Function.	Recognize ideal occlusion and differentiate disharmony	<ul style="list-style-type: none"> Examine the occlusion Identify and interpret malocclusion 	Lecture/ CBL	
5. METABOLIC BASIS					
Bone Metabolism	Describe different tissue changes, Difference between physiologic movement and orthodontic movement, Describe Patho-physiological change of tissue, Histopathological changes at the pressure and tension area, List the types of tooth movement, explain effect of normal and excessive force, Explain the tissue changes with different types of	Recognize the normal bone metabolism and relate with orthodontic tooth movement	Compare normal and abnormal force levels and identify deleterious orthodontic effects	Lecture/ CBL	



	<p>appliances including the myo-functional appliance, Explain the biological basis of Orthodontics Therapy, Effect of drugs, State favorable and unfavorable incidence of tooth movement, Role of bone in eruption and stabilization</p> <p>Deleterious effects of orthodontic tooth movement on periodontium</p>				
6. MALOCCLUSION					
Etiology Of Malocclusion	<p>Definition, Etiological Factors (local factors eg tooth size, number and shape) (general factors) (specific causes of malocclusion Adenoids, Respiration and speech) and various terminologies.</p>	Identify the cause of malocclusion		Lectures/CBL/PBL	
Malocclusion and Treatment planning	<p>Class I (non-skeletal) problem e.g. crowding, spacing, crossbites, openbite and deepbite), Class II (skeletal problem, div 1 and 2) and Class III (types), planning, diagnosis and management, Diagnosis, planning and treatment of simple and complex malocclusion using a range of: Removable, Functional and Fixed appliance. Describe method of treatment, Types of Orthodontic Appliances, Tooth-jaw discrepancy, Extraction and non-extraction planning, A criterion and</p>	<ul style="list-style-type: none"> Identify orthodontic problems and its features Organize a problem list Formulate a treatment plan 		Lectures/CBL/PBL	



	Choice of teeth for extraction, Contraindication for extraction, Extraction with Orthodontic Treatment.				
7. PROTOCOLS DURING MIXED DENTITION					
Protocols used in relieving dental and skeletal problems during mixed dentition	Protocols of relieving mixed dentition crowding, Diagnosis & management of Habits, serial extractions, crossbites, space regaining, space supervision and Growth modifications, various appliances used. Explain interceptive and preventive orthodontics and methods	<ul style="list-style-type: none"> Identify non skeletal and mild skeletal orthodontic problems in mixed dentition stage Manage mixed dentition problems 	Design/ construct simple orthodontic appliances	Lectures/CBL/PBL	
8. ORTHODONTIC APPLIANCES AND BIOMECHANICS					
Orthodontic Appliances	Removable Appliance (Definition, Basic requirement of an Orthodontic appliance, General wire bending exercise, Design and construction of different springs and clasps, Components of removable appliance, Describe general principle of design and fabrication of removable appliance, State the type of appliance for different tooth movements, e.g. labiolingual, expansion and contraction of arches, Construction of Hawley,	Identify and differentiate different orthodontic appliances	Design and construct simple removable orthodontic appliances.	Lectures/CBL/PBL	



	<p>Begg retainer and Bite planes, Trimming and Polishing, Insertion and advice for the patients, Follow up and adjustments, Care during treatment)</p> <p>Selective case presentation.</p> <p>Functional jaw orthopedics (Describe Orthopedic force and its principles, Narrate Myo-functional appliance and describe its indication and contraindication, Technique and training for the construction of Myo-functional appliance, Clinical and laboratory steps in the construction of Class II and Class III Activator (Anderson/Monoblock type) and Twin Block, Adjustment of activator after insertion in the oral cavity, Care during treatment)</p> <p>Selective case presentation.</p> <p>Fixed Appliances (Describe Principles, identify parts and appliance system currently used, list the advantages and disadvantages, technique and training of Fixed appliance, general wire bending exercise, use of multiple loop used in Fixed appliance, upper and lower ideal arch formation, Offset and Inset bend, 1st, 2nd and 3rd order bend, Toe</p>				
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	<p>in and Tip back bend, Molar band formation and welding of molar tube in the band with ideal position, Cementing of the band, Weldable bracket positioning, Direct bonding technique of mesh bracket, Adjustment of arch wire and follow up, Stages of treatment progression by Fixed appliance, Anchorage (Types of anchorage, Preparation and assessment of anchorage planning, Anchorage planning according to the needs: Mild, Moderate and Maximum, Increase anchorage value- Use of head gear, Chin cup and other Extra-oral/Intra-oral anchorage) planning, Leveling, Canine retraction, Arch/Anterior contraction, both arch coordination and retention, Care during treatment) Selective case presentation.</p>				
<p>Material instruments and techniques used in orthodontics</p>	<p>Different materials, instruments and techniques used in Orthodontics, Properties of SS wire and NiTi alloy. Principle and method of wire bending exercise, Soldering- Introduction and definition, Composition and properties of Silver Solder and Fluxes, Soldering</p>	<ul style="list-style-type: none"> Identify and relate different orthodontic materials Explain wire modification procedures 	<p>Practice different wire bending exercise</p>	<p>lectures</p>	



	Flame, soldering method and procedure, Welding- Definition, principle and mechanism of spot welding, Heat treatment procedure.				
Biomechanics	Concept, Advantages & disadvantages, limitations, Anchorage, types of movements, types of forces, wires and Alloys used in orthodontics, ideal properties, comparison of different alloys,	<ul style="list-style-type: none"> List the biomechanical requirements of different orthodontic appliances and their anchorage requirements Recall the clinical implementation of biomechanical requirements of orthodontic appliances 	Aware of clinical implementation of biomechanical requirements of orthodontic appliances and CBLs	Lectures/CBL	
9. MULTIDISCIPLINARY ORTHODONTICS					
Cleft lip & plate & orthognathic surgery	Etiological factors role of orthodontist, treatment procedures at different age groups, indication of OGS, stages of OGS, Various adjunctive and types of surgical procedures	Define and explain problems and pathophysiology	Be able to formulate problem list plan discrepancies according to age groups and PBLs.	Lectures/CBL/ PBL	
Adjunctive and Multi-disciplinary orthodontic Approaches	Adjunctive treatment goals and principles, Describe Adult Orthodontics, Appliance and technique for Adult Orthodontics, Multi-disciplinary treatment procedures. Pre-surgical Oral- Orthopedic and Orthodontic procedure and Post-surgical Orthodontic Procedure, Pre-restorative Orthodontic Procedure,	Be aware of multidisciplinary approaches pertinent to orthodontic problems	Be able to predict appropriate team for orthodontic referrals and PBLs and CBLs.	Lectures/CBL/ PBL	



	Describe preventive Periodontics. TMJ Dysfunction. Selective case presentation.				
10. RETENTION PROTOCOLS					
Retention And Relapse	Define retention and relapse, Causes, factors, various types of retainer's role of periodontal tissues and allied causes of relapse, concept of retention and relapse, occlusal stability and management, evaluate relapse after orthodontic treatment, retention after correction of different malocclusion, theorems.	Choose appropriate retention regime and post treatment review of treated cases	Design simple retention appliances	lecturs/CBLs /PBLs.	



List of Clinical Demonstrations
Orthodontics
Final Year Clinical Rotation Orthodontics

Sr.#	Demonstration / Tutorial
1	Orientation to Orthodontic department and clinical area
2	History taking and Clinical examination
3	Impression taking and bite registration
4	Radiology techniques and interpretations
5	Case preparation (radiographic tracing, cast analysis, photographic evaluation)
6	Basic wire bending exercises
7	Appliance fabrication and insertion
8	Group discussion
9	Orientation with instruments and appliances



Learning resources

Topics	Resources
Introduction to the Orthodontics	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6 th Edition
Epidemiology	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6 th Edition
Growth and Development	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6 th Edition
Development of Dentition	<ol style="list-style-type: none"> 1. Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition 2. Handbook of Orthodontics. Cobourne MT, DiBiase AT .2nd Edition
Occlusion	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6 th Edition
Diagnostic aids in Orthodontics	<ol style="list-style-type: none"> 1. Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition 2. Introduction to radiographic cephalometry. Jacobson A, Caufield PW
Etiology of Malocclusion	<ol style="list-style-type: none"> 1. Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition 2. An introduction to Orthodontics. SJ Littlewood, L Mitchell
Treatment Modalities	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6 th Edition
Preventive and Interceptive Orthodontics	<ol style="list-style-type: none"> 1. Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition 2. Handbook of Orthodontics. Cobourne MT, DiBiase AT .2nd Edition
Biomechanics	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6 th Edition
Material instruments and techniques used in Orthodontics	<ol style="list-style-type: none"> 1. Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition 2. Handbook of Orthodontics. Cobourne MT, DiBiase AT .2nd Edition
Orthodontic Appliances	<ol style="list-style-type: none"> 1. Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition 2. Handbook of Orthodontics. Cobourne MT, DiBiase AT .2nd Edition
Anchorage	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6 th Edition



Bone Metabolism	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition
Cleft Lip and Palate	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition
Orthognathic Surgery	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition
Adjunctive and Multi-disciplinary Orthodontics	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition
Retention and Relapse	Contemporary Orthodontics. Proffit WR, Fields Jr HW, Sarver DM. 6th Edition
Dental Radiology	Essentials of dental radiography and radiology. Whaites E, Drage N. 3 rd Edition



OTHER LEARNING RESOURCES

<u>Hands- on Activities / Practical</u>	Students will be involved in Practical sessions and hands-on activities that link with the module to enhance the learning.
<u>Labs</u>	Utilize the lab provides the simulated learning to the specimens and models available.
<u>Skills Lab</u>	A skills lab provides the simulated learning experience to learn the basic skills and procedures.
<u>Videos</u>	Video familiarize the student with the procedures and protocols to assist patients.
<u>Computer Lab/CSs/DVDs/ Internet Resources</u>	To increase the knowledge, students should utilize the available internet resources and CDs/ DVDs. This will be an additional advantage to increase learning.
<u>Self-Learning</u>	Self-Learning is scheduled to search for information to solve cases, read through different resources and discuss among the peers and with the faculty to clarify the concepts.



Summative assessment methods and policies

Internal Assessment

- a. Weightage of internal assessment shall be 20 %, each for theory and practical, in BDS Professional Examination.
- b. The Internal Assessment shall comprise of monthly test/PBL/assignments/Clinical tests/Clinical vivas, etc.
- c. The Internal Assessment record shall be kept in the respective department of the College/Institute and after approval of Principal, a summary as per University registration number shall be furnished to the Controller of Examinations, at least two weeks before the commencement of final examination.
- d. The result of all the class tests/tools which contribute towards IA will be displayed to the students during an academic year.
- e. The same internal assessment shall be counted both for annual and supplementary examinations. The students who are relegated, however, can improve the internal assessment during subsequent year
- f. Internal assessment tools of any subject may be changed after the approval of respective FBS.

Annual Examination

- a. The weightage of Annual Examination shall be 80%, each for theory and practical, in BDS.
- b. The examination comprises of a theory paper and practical/clinical examinations as per PM&DC regulations and the Table of Specifications (TOS) of the University.
- c. The gap between two consecutive theory papers shall not be more than two days.
- d. The Theory Paper shall be of 3-hours duration, held under the arrangements of the university. It shall have two parts; MCQs (30%) and SAQs/SEQs (70 %). It may be changed after the approval of Academic Council.
- e. Allocated time for MCQs for shall be as under:

25 MCQs	-	30 Minutes
30 MCQs	-	40 Minutes
40 MCQs	-	50 Minutes
45 MCQs	-	60 Minutes
- f. Each MCQs shall have four distractors

Internal Examiner

He/she shall be Professor and Head of Department who has been involved in teaching of the class being examined. Second preference shall be Associate/Assistant Professor who is involved in teaching of the class and posted there for one year. Third preference shall be a recognized Professor of the subject.

External Examiner

He/she shall be a Professor/Associate Professor of a recognized Medical/Dental College or at least an Assistant Professor with three years teaching experience in the relevant subject.

Conflict of Interest

No person shall serve as an examiner whose close relative (wife, husband, son, daughter, adopted son, adopted daughter, grand-son, grand-daughter, brother, sister, niece/nephew, son and daughter-in-law



brother and sister- in-law, parental and maternal uncle and aunt etc) is appearing in the examination. All examiners likely to serve as an examiner shall render a certificate in compliance to this para.

Paper Setting

- a. Each College / Institute shall forward a set of two question papers as per TOS along with the key for each subject to the Controller of Examinations, at least three months in advance of the annual examination. The question paper as a whole / a question without a comprehensive key shall not be considered towards final paper setting.
- b. The set of question papers shall be prepared by the respective Head of Department (HoD) and furnished to Controller of Examinations through Head of Institution (HoI)
- c. The Controller of Examinations shall approve the faculty for the final paper setting having fair representation of each college / institute.

Paper Assessment

- a. The Controller of Examinations shall approve the faculty for the theory paper marking, to be undertaken in the manner as deemed appropriate.
- b. The Examination Directorate shall coordinate directly with the faculty, earmarked for the paper marking
- c. A student who scores 85% and above marks in any subject shall qualify for distinction in that particular subject.
- d. A fraction in aggregate marks of a subject shall be rounded off to whole number. If it is less than 0.5 then it will be rounded off to the previous whole number while 0.5 or more will be rounded off to the next whole number.

Practical / Clinical Examinations

- a. The Controller of Examiners shall approve the faculty to serve as the internal & external examiners.
- b. The number of external and internal examiners shall be equal.
- c. One external & internal examiner each shall be marked for a group of 100 students.
- d. Candidates may be divided into groups in the clinical and practical examinations and be standardized by incorporating clinical exam
- e. Practical/clinical examination shall be held after the theory examination of the subject but in special cases, it may be held before the theory examination with the approval of the Controller of Examinations. For the purpose of practical/clinical examination, the candidates may be divided into sub groups by the examiners.
- f. The assessment of the practical / clinical examination duly signed by internal & external examiner shall be furnished to the Controller of Examinations within one week of the conclusion of examination.

Pass Marks

- a. Pass marks for all subjects less Islamic / Pakistan Studies, shall be 50 % in theory and practical, separately.
- b. Pass marks for Islamic / Pakistan Studies shall be 33 % which, however shall not be counted towards final scoring of the professional examination.
- c. No grace marks shall be allowed to any student in any examination.



Declaration of Result

Every effort shall be made to declare the result of each examination within one month of the last practical examination or earlier.

Promotion.

No student shall be promoted to the higher classes unless he/she passes all the subjects of the previous class

Re-Totaling.

Any student may apply to the Controller of Examinations on a prescribed form along with the specified fee.

Supplementary Examination.

The interval between a supplementary examination and the previous professional examination shall not be more than two months. There shall be no special supplementary examination.



Table of specification for Annual Professional

Exam: Theory

Sr. No	Topic	No of MCQs (30) (01 marks each)	No. of SEQs (09)
1	Introduction to the Orthodontics	03	1
2	Growth and Development	03	1
3	Occlusion	06	1
4	Diagnostic aids in Orthodontics	04	1
5	Malocclusion	06	1
6	Protocols during mixed dentition	06	1
7	Orthodontic appliances and biomechanics	06	1
8	Metabolic Basis	04	1
9	Multi-disciplinary Orthodontics	04	1
10	Retention Protocol	03	1
Total		45 (45 marks)	09 (45 marks)
Grand Total		90 Marks	

Levels

MCOs

Recall

18

Application

27

Table of specifications for Annual Professional Exam: Practical

VIVA 90 marks		Practical / Clinical 90 marks				Total
Examiner 1	Examiner 2	Cast Analysis	Ceph and OPG Analysis	Wire bending	OSCE	180 Marks
45 Marks	45 Marks	15	30	15	30	



Internal Assessment Calculation (Theory)

A	B	C	D	E	F	G	H
Roll No.	Name	1 st Mid term	1 st term	2 nd Mid term	2 nd term	Pre-Annual Exam	Total Marks of internal assessment out of 10
							$(C+D+E+F+G) \div 360 \times 10$
		45 marks	90 marks	45 marks	90 marks	90 marks	10 marks

Internal assessment calculation (Practical)

A	B	C	D	E	F	G
Roll No.	Name	Cast analysis ALD Mixed Dentition Wire bending	Ceph Tracing	End of rotation score	Pre-annual (Practical)	Total Marks of internal assessment out of 10
						$(C+D+E+F) \div 400 \times 10$
		80 marks	80 marks	60 marks		20 Marks



Sample MCQs and SEQs

Multiple Choice Question (MCQs)

- A multiple choice question (MCQ) consist of a stem that states the question or problem followed by a set of possible answers that contain an option that is best answer to the question.
- After reading the questions students should select the appropriate option from the given possible answers.
- The correct answer carries one mark and incorrect carries zero. There is no negative marking.

Sample MCO

A malformation in the transverse plane is most likely to express itself as a:

- a) Downward and backward rotation of mandible
- b) Cross bite
- c) Forward rotation of the mandible
- d) Open bite

Key: b

Short essay question (SEQs)

- Short essay questions require students to present written answers that are used to assess basic knowledge of key facts and provide students with an opportunity to demonstrate reasoning and explain their understanding of the subject.

Sample SEO

- a) Define growth site and growth center. Give examples of each.
- b) What type of ossification occurs in the cranial base? Describe the growth of the cranial base.

Key:

- a) Growth site:

Growth site is the location where the growth occurs, e.g. sutures, condyle.

Growth center:

Growth center is the location where independent (genetically controlled) growth occurs, e.g. synchondroses.

- b) Endochondral ossification.

1. Centers of ossification appear early in the embryonic life in the chondrocranium.
2. As ossification proceeds bands of cartilage called synchondroses remain between centers of ossification.
3. The synchondrosis has an area of cellular hyperplasia in the center with bands of maturing cartilage extending in both directions, which will eventually be replaced by bone.

