In the Name of God

Islamic Republic of Iran
Ministry of Health, Treatment and Medical Education
Tabriz University of Medical Sciences

Curriculum of Orthodontics Postgraduate (MSc) Program

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Section I

Title: Orthodontics

Degree: Master of Science in Clinical Dentistry (MSc)

Introduction

Orthodontics is one of the dental specialty majorsencompassing prevention, diagnosis and treatment of dentoalveolar disorders; graduation from the course will lead to the MSc degree.

Definition

The main subjects and services provided by the graduates of the program consist of:

- Playing a role in health care as a key factor in sustainable development of the society
- Prevention of complications due to dentoalveolar disorders given their prevalence, gradation of the quality of life and reduction of health care costs nationwide
- Correct treatment of dentoalveolar disorders with regard to their importance in providing, maintaining and promoting public health
- Being informed of the latest scientific and technical achievements
- Conducting research and extending borders of science

The Aim of the Course

The aim of this educational program is training orthodontists who are at global level from the aspects of knowledge and science and practical skills. In addition, they will be able to provide preventive and therapeutic services with standard quality in their field besides being capable of providing educational service and playing an active role in advancing and expanding science and research limits.

General Competencies

Effective communication with patients, accurate examinations, proper application of paraclinical tests, familiarity with modern science and technology, accurate diagnosis and appropriate treatment planning, proposing appropriate preventive

and therapeutic strategies, conducting research with the aim of solving existing problems, educating patients and colleagues, and management of and participation in the health team.

Professionalism and ethical expectations from the graduates: It is expected that the graduates:

a) **In the area of altruism:**will prefer the patient's interests to their own, observe justice while working with different patients, consider all the physical, psychological, social and belief-related aspects of patients while treating them, spend enough time in all the phases of patient care, pay attention to patients' demands and discomforts, observe the patients' bill of rights.
b) **In the area of dutifulness and responsibility:**will have enough commitment to fulfill their tasks, answer patients' questions, provide patients and their parents or guardians with information regarding the patient's status in the most appropriate way, avoid unnecessary interference in colleagues' work and interact with the health team members, ask patients' permission for examining and taking any diagnostic-therapeutic measures, and instruct patients properly regarding prevention, appearance of side effects, disease remission and improvement of life quality.
c) **In the area of honor and honesty:** willbe truthful, honest and confident and respect patient's privacy.
d) **In the area of respecting others:**will respect patients' conventions, traditions and habits, respect patients as human beings, respect patients' time and observe order and regularity, respect patients' parents and guardians, colleagues and therapeutic team members, and have an appearance appropriate to professional prestige.
e) **In the area of professional career:**will accept criticism, know their scientific limitations, ask for advice and help if needed, improve their knowledge and skills constantly, adopt diagnostic-therapeutic measures according to available facilities and scientific achievements, and observe the standards of completing medical records and reporting.

Specific Competencies and Skills **(Special Qualifications)**

Orthodontic postgraduates ought to achieve these capabilities:

1. Complete identification and diagnosis of dentofacial disorders and evaluation of multifactorial nature of such disorders in relation to dentoalveolar disorders.

2. Establish a deep concept of biologic knowledge and its relation to clinical orthodontics.
3. Acquire the necessary knowledge and skill in the treatment plan procedure and apply various therapeutic methods for prevention and correction of dentoalveolar disorders.
4. Acquire the necessary knowledge and skill in forming relationships, coordination and presenting services in relation toother specialties.
5. Evaluate capabilities and use new research data in clinical treatments.
6. Acquire sufficient knowledge and capability in the field of research methodology and present research projects in orthodontics.

The Terms and Conditions of Admission to the Course

Each applicant's documents, including his/her DDS/BDS degree, CV, recommendations, etc. will be reviewed by the faculty members of Orthodontics Department. Based on the documents, the applicant will be accepted for either an interview or a three-month evaluation period to be an observer in Orthodontics Department. If he/she could successfully pass the interview/evaluation period, he/she will be accepted to continue as an MSc student.

Educational Strategies, Methods and Techniques

The following educational strategies are considered in orthodontics:

Learner-centered education, learning based on problem solving, integration of basic and clinical sciences, evidence-based learning, lifelong community-oriented education and systematic education.

Theeducational system of the orthodontics MSs program is semestrial. Courses are theoretical, practical and theoretical-practical and are presented in basic, related and special science courses forms.

Student Assessment

A variety of assessment methods, including theoretical exams, DOPS, OSCE, seminar presentations, portfolios, etc., depending on the course, are implemented.

Number and Type of educational units and Tables of the Courses (including compulsory and optional [elective] courses)

The orthodontics MSc program is a 3-year full-time program in accordance with the regulations of theCouncil ofDental and Specialty Educations.

Course Structure

Orthodontics postgraduate course structure includes basic, related and special science courses:

1. Basic courses are considered to be the infrastructure of related science and specialty science courses and their aim is to remind, update, expand and deepen the topics that are presented in this specialty program.

Basic science courses which consist of 374h of postgraduate program are taught in two forms:

A. Common basic science courses are taught (255 h) by basic science specialists to allthe residents.

B. Special basic science courses are taught (119 h) by Orthodontics Department under thesupervision of the professors.

2. Related science courses: These courses discuss the scientific relationship with other specialty fields of dentistry and teach knowledge, creativity and making correct decisions to residents so that they can participate in team work attempts to provide comprehensive care for patients by recognizing abilities, priorities, limitations and new developments in science. Related science courses consist of 102 h of postgraduate program, which are presented in common with related education departments.

3. Special science courses: These courses which are the main postgraduate program content are taught with the goal of knowledge and science promotion and skill acquisition in orthodontics.

Specialty science courses consist of 2269 h of the postgraduate program, which will be taught by the related education department faculty members.

Total education hours of postgraduate orthodontics are2745 h.

1: Common Basic Science Schedule

Course code	Course	Credit hours			
		Workshop	Theoretical	Practical	Total
1	Research methodology1	2			102
2	Research methodology2	2			102
3	Scientific writing	1			51
Total		5			**255**

2.Special Basic Science Schedule

Course code	Course	Credit hours			
		Workshop	Theoretical	Practical	Total
4	Oral physiology and biology		1		17
5	Craniofacial genetics		1		17
6	Clinical photography	1			51
7	Practice management		2		34
Total		1	4		**119**

3. Related Courses

Course code	Course	Credit hours			Prerequisite courses
		Theoretical	Practical	Total	
8	Prosthodontics	1		17	
9	Periodontology	1		17	
10	Oral and maxillofacial surgery	1		17	
11	Oral and maxillofacial surgery		1	34	
12	Oral and maxillofacial radiology	1		17	
Total				**102**	

4. Special Science Courses

Course code	Course	Credit hours			Prerequisite courses
		Theoretical	Practical	Total	
13	Literature review 1	1		17	
14	Literature review 2	1		17	13
15	Biomechanics	2		34	
16	Biology of tooth movement and tissue response	1		17	15
17	Diagnostic imaging	2		34	
18	Principles of diagnosis and treatment planning	2		34	
19	Removable preclinic		1	34	
20	Fixed preclinic		1	34	
21	TypoDont		4	136	
22	Fixed technique 1	1		68	
23	Fixed technique 2	2		25	22
24	Principles of removable appliances	2		34	
25	Treatment 1	2		34	
26	Treatment 2	2		34	17, 18, 25
27	Treatment 3	1		17	25, 26
28	Orthosurgery	2		34	25, 26
29	Occlusion development	1		17	
30	Growth and development	1		17	
31	Retention and relapse	1		17	
32	Syndromes and lip and palate clefts	2		34	
33	Biomaterials	1		34	
34	Occlusion and TMJ disorders	1		17	
35	Patient presentation (treatment planning) 1		1	34	
36	Patient presentation (treatment planning) 2		1	34	35
37	Patient presentation (result assessment) 1		1	34	36
38	Patient presentation (result assessment)2		1	34	37
39	Clinical treatment 1		4	136	
40	Clinical treatment 2		5	170	
41	Clinical treatment 3		8	272	
42	Clinical treatment 4		7	238	
43	Clinical treatment 5		8	272	
44	Thesis 1		2	34	
45	Thesis 2		2	34	
46	Thesis 3		2	34	
47	Thesis 4		6	204	
Total		**28**	**56**	**2269**	

Ethical Issues

The graduates should

- observe the Patient's Bill of Rights[1] when working with the patients.
- strictly observe Biosafety and Patient Safety Rules* concerning the patients, personnel and workplace.
- observe the Rulebook for Dress Code[2].
- strictly observe the Regulations of Working with the Laboratory Animals[3].
- carefully preserve resources and equipment.
- truly respect faculty members, the staff, classmates and other students and try to create an intimate and respectful atmosphere.
- observe social and professional ethical considerations in criticism.

1, 2 and 3 are contained in the Enclosures.

* Biosafety and Patient Safety Rules will be set out by the Educational Departments and will be available to the students.

Section II

Unit title: Research methodology 1

Unit code: 1

The number of units: 2 units (workshop)

Unit type: Common basic science

Aims: Familiarity with principles of various research methods, familiarity with and acquiring skills about types of epidemiological studies and proper codification of a research project with subsequent questionnaire and sample volume

Evaluation: Presenting a proposal according to the subtitles taught as a project or portfolio

Subtitles

1. Acquiring skill in searching scientific references and Iranian national digital library
2. Familiarity with research basics and epidemiological studies cycle
3. Health and disease measuring scales
4. Subject selection and statement of problem
5. Goals, hypotheses and research variables
6. Familiarity with different types of epidemiological studies
7. Preparation of research questionnaire
8. Sampling and sample volume
9. Ethics in research
10. Study management

Unit title: Research methodology 2

Unit code: 2

The number of units: 2 units (workshop)

Unit type: Common basic science

Aims: Familiarity with different kinds of descriptive studies, observational experimental analysis based on evidence and systematic review studies

Evaluation: Presenting a proposal according to the subtitles taught as a project or portfolio

Subtitles

1. Descriptive and ecological studies and subsequent statistical analyses
2. Types and principles of analytical-observational studies and subsequent statistical analyses
3. Experimental studies and subsequent statistical analyses
4. Errors and reasons
5. Diagnostic methods' evaluation studies
6. Principles and methods of evidence-based dentistry
7. Familiarity with systematic review studies

Unit title: Scientific writing

Unit code: 3

The number of units: 1 unit (workshop)

Unit type: Common basic science

Aims: Familiarity with different kinds of articles and their writing methods and the relevant software programs, article submission and follow-up

Evaluation: Presenting an article and its modification with software according to the subtitles taught as a project or portfolio

Subtitles

1. Different kinds of scientific articles
2. Familiarity with the structure of original research articles
3. Scientific writing instructions
4. Familiarity with Endnote software
5. Critical appraisal
6. Article submission andfollow-up
7. Plagiarism

Unit title: Oral physiology and biology
Unit code: 4
The number of units: 1 unit(theoretical)
Unit type: Special basic science
Aims: Familiarity with pain physiology and oral cavity functions
Evaluation: Written exam

Subtitles

1. Respiratory physiology and mechanisms
   -Effect of respiratory disorders on the jaw, face and dental system
2. Chewing and swallowing physiology and mechanisms
   - Effect of swallowing disorders on the jaw, face and dental system
3. Speech physiology and mechanisms
   - Effect of speech disorders on the jaw, face and dental system
4. Pain physiology and control
5. Neuromuscular system physiology
   - Effect of neuromuscular disorders on the jaw, face and dental system

Unit title: Craniofacial genetics

Unit code: 5

The number of units: 1 unit(theoretical)

Unit type: Specialized basic science

Aims: Familiarity with general principles of inheritance and hereditary diseases and diagnosis of modern genetic disorders

Evaluation: Written exam

Subtitles

1. Definition of principles of genetics
2. Types of genetic disorders and their inheritance
3. Role of genetics in dental development
4. Effect of genetics and environment on facial symmetry
5. Genetics and external root resorption
6. Genetic research into skeletodental disorders
7. Genetic assessments in different responses to treatment
8. Familiarity with modern prenatal diagnostic techniques of genetic disorders
9. Principles of genetic engineering techniques and recombinant DNA

Unit title: Clinical photography

Unit code: 6

The number of units: 1 unit (workshop)

Unit type: Specialized basic science

Aims: Familiarity with different types of cameras and taking photographs of orthodontic patients and 2- and 3-dimensional analysis

Evaluation: Presenting a photograph according to the subtitlestaught as a project

Subtitles

1. Familiarity with conventional and digital cameras
2. Familiarity with application of camera and using an appropriate rest
3. Familiarity with kinds of retractors, mirrors and their application
4. Acquiring knowledge about standard orthodontic photographs and their process
5. Familiarity with 3D photographs
6. Photograph analysis
7. 3D photographs analysis
8. Superimposition of photographs and radiographs
9. Familiarity with restoration of 2- and 3-dimensional photographs

Unit title: Treatment management

Unit code: 7

The number of units: 2 units (theoretical)

Unit type: Special basic science

Aims: Familiarity with infection control principles and orthodontic patients' hygiene, documentation of patientsand document filing management, rules, medical ethics and treatment economy

Evaluation: Written exam for the field of cognition and portfolio for the field of attitude

Subtitles

1. Principles of infection control in the orthodontic clinic
2. Hygiene for patients during orthodontic treatment
3. Principles of admission system management and documentation in the office
   -Admission
   -Documentation
   -Dental casts and photographs and paraclinical records
   -Restoration
   -Recording the treatment progress
4. Familiarity with office management software
5. Patient management in orthodontics
6. Familiarity with thenecessary rules in professional performance and patient contact
7. Medical ethics
   -Definitions
   -Physician and patient contact
   -Treatment type and patient satisfaction
8. Familiarity with scientific associations' regulations
9. Familiarity with principles of treatment economics in orthodontics

Unit title: Dental prosthesis

Unit code: 8

The number of units: 1 unit (theoretical)

Unit type: Special related science

Aims: Familiarity with treatment method in additional orthodontic and prosthetic treatments.

Evaluation: Seminar presentation or essay

Subtitles

1. Simultaneous orthodontic and prosthetic treatments in congenitally missing and extracted teeth
2. Simultaneous orthodontic and prosthetic treatments in tooth axis correction and molar uprighting
3. Simultaneous orthodontic and prosthetic treatments in forced eruption
4. Familiarity with malocclusion camouflage limitations from prosthodontic aspect in 3 dimensions
5. Orthodontic and prosthodontic considerations in implants
6. Preprostheticorthosurgery treatments' sequence
7. Orthodontic and prosthodontic considerations in cleft patients

Unit title: Periodontics

Unit code: 9

The number of units: 1 unit (theoretical)

Unit type: Special related science

Aims: Familiarity of orthodontic residents with cooperation with periodontists about periodontal considerations in orthodontic treatment

Evaluation: Seminar presentation or essay

Subtitles

1. Normal periodontium characteristics and new classification of periodontal diseases
2. Familiarity with periodontal hygiene care before and during orthodontic treatments
3. Priorities of orthodontic and periodontal treatments
4. Periodontium management in patients undergoing orthodontic treatment:

-Decrease in attached gingiva

-Bone resorption, bone regeneration and socket preservation

-Impacted and malaligned teeth

-High frenal attachment

-Implant candidates

-Extrusion and crown lengthening candidates

Unit title: Oral and Maxillofacial Surgery

Unit code: 10

The number of units: 1 unit (theoretical)

Unit type: Special related science

Aims: Familiarity with types of lower and upper jaw surgeries and methods of jaw fixation and different surgeries in syndromic patients

Evaluation: Seminar presentation or essay

Subtitles

1. Principles of surgical treatments in patients withdentofacial deformities
   -Anesthetic considerations
   -Blood supply and its control
   -Patient management in surgery
   - The immediate postsurgical period
   -Familiarity with fixation methods and their application
   -Postsurgical patient management
2. Familiarity with upper jaw surgeries
3. Familiarity with lower jaw surgeries
4. Familiarity with bimaxillary surgeries
5. Familiarity with segmental surgeries
6. Familiarity with TMJ surgeries
7. Familiarity with chin surgeries
8. Familiarity with adjunctive (nose, cheeks, lips etc.) surgeries
9. Familiarity with surgical methods in cleft lip and palate patients and common craniofacial syndromes
10. Prevention and control of orthognathic surgery side effects
11. Familiarity with new methods of orthognathic surgery
12. Familiarity with distraction osteogenesis technique

Unit title: Oral and Maxillofacial Surgery

Unit code: 11

The number of units: 1 unit (practical)

Unit type: Special related science

Aims: Practical familiarity with observation, diagnosis and treatment planning and therapeutic methods in common orthodontic and surgical patients

Evaluation: Seminar presentation or essay

Subtitles

1. Cooperation with surgeons in preparation of orthosurgery patients, including diagnosis, surgical models and splint preparation, cephalometric prediction; familiarity with systemic considerations and complications
2. Presence in the operating room and familiarity with surgical techniques in at least 3 orthosurgery patients
3. Postsurgical patient management (postoperative contribution in patient management)

Unit title: Oral and maxillofacial radiology

Unit code: 12

The number of units: 1 unit (theoretical-practical)

Unit type: Special related science

Aims: Familiarity with common and modern intra- and extra-oral radiologic techniques and subsequent differential diagnosis of oral and dental lesions

Evaluation: Seminar presentation or essay

Subtitles

1. Acquiring knowledge about cephalometric and panoramic radiographs with digital and analogue techniques
2. Familiarity with radiologic techniques for TMJ assessment and their interpretation
   -MRI
   -Arthrography
   -CT Scan
   -Tomography
3. Familiarity with CBCT principles, applications and interpretation
4. 3D radiographic methods, applications and interpretations
5. Familiarity with new radiographic techniques and their application in orthodontics
6. Acquiring knowledge aboutmodern standards of radiation safety in new radiologic techniques

Unit title: Literature review 1, 2

Unit code: 13, 14

The number of units: 2 units (theoretical)

Unit type: Special science

Aims: Assessing and criticizing reliable national and international articles in order to acquire new knowledge and research techniques related to orthodontics for the purpose of practical application of articles

Evaluation: Presenting and criticizing articles in essay or live form

Subtitles

1. Familiarity with important journals in the field of orthodontics
2. Familiarity with the level of evidence and evidence-based orthodontics
3. Practical assessing of important articles in journal clubs(new and old)

Unit title: Biomechanics

Unit code: 15

The number of units: 2 units (theoretical)

Unit type: Special science

Aims: Familiarity with the mechanical and biomechanical principles of tooth movement

Evaluation: Written exam or essay

Subtitles

1. Familiarity with principles and implication of biomechanics and analyzing the forces
2. Familiarity with biomechanics of tooth movement in various tooth movements and forces
3. Familiarity with mechanical characteristics of orthodontic equipment
4. Familiarity with biomechanical principles of segmented and continuous techniques
5. Anchorage and its biomechanics
6. Biomechanics of inter- and intra-maxillary elastics
7. Biomechanics of orthopedic tools
8. Analyzing the forces in peripheral techniques such as V-bend, tip-back, reverse curve ,utility arch, T-loop, L-loop, box loop, extrusion and other springs
9. Biomechanics of mini-screws and implants

Unit title: Biology of tooth movement and tissue response

Unit code: 16

The number of units: 1 unit (theoretical)

Unit type: Special science

Aims: Familiarity with physiology of bone and adjacent tissues, types of tooth movement and tissue response

Evaluation: Written exam or essay

Subtitles

1. Bone physiology against forces
2. Methods of bone and periodontium modification assessment subsequent to forces
3. Tissues adjacent to teeth
4. Tooth movements in orthodontics and the response of adjacent tissues
5. Types of forces and movements in orthodontics and their effects ontissuesadjacent to teeth
6. Tissue response following orthodontic and orthopedic forces
7. TMJ tissue response following orthodontic and orthopedic forces
8. Tooth and adjacent tissue response in orthodontics

Unit title: Diagnostic imaging
Unit code: 17
The number of units: 2 units (theoretical)
Unit type: Special science
Aims: Familiarity with cephalometry and its various analyses in orthodontics
Evaluation: Written exam or essay

Subtitles

1. Familiarity with application of cephalometry software
2. 3D cephalometry
3. History of cephalometry
4. Radiographic principles of cephalometry
5. Cephalometric landmarks and their tracing
6. Hard tissue analysis such as Down's, Steiner, McNamara, template, Mesh Diagram, Wits, Ricketts, cervical vertebral analysis(Baccetti)
7. Posterior-anterior cephalogram analysis
8. Soft tissue analysis

Unit title: Principles of diagnosis and treatment plan

Unit code: 18

The number of units: 2 units (theoretical)

Unit type: Special science

Aims: Familiarity with development and health assessment methods from different aspects and diagnosis and evaluation of records in orthodontics, classification and triage of orthodontic disorders

Evaluation: Written exam or Essay

Subtitles

1. Medical and dental history
2. Physical development assessment
3. Socio-mental development assessment
4. Oral health assessment
5. Occlusion and jaw function assessment
6. Smile, face and tooth appearance assessment
7. Assessment of diagnostic casts
   -Mixed dentition
   -Permanent dentition
   -Total space analysis
8. Classification and characteristics of malocclusion
9. Treatment needs and demands
10. Soft tissue paradigm
11. Orthodontic triage

Unit title: Removable preclinic

Unit code: 19

The number of units: 1unit (practical)

Unit type: Specialized science

Aims: Practical familiarity with various removable and functional appliances in orthodontics

Evaluation: Practical final exam at "shows how" level

Subtitles

1. Practical familiarity with impression making and impression modification
2. Wire bending
3. Fabrication of various springs
4. Fabrication of labial arches
5. Fabrication of various clasps
6. Fabrication of various removable expansion appliances
7. Fabrication of various functional appliances
   -Bionator
   -Franckel
   -Farmand
   -Twin block
8. Fabrication of occlusal split appliance for TMD patients
9. Application method of chin caps, facemasks and oral screen appliances
10. Fabrication of clear plastic retainers
11. Familiarity with "diagnostic set-up" method and its implementation

Unit title: Fixed preclinic

Unit code: 20

The number of units: 1unit (practical)

Unit type: Specialized science

Aims: Practical familiarity with components of various fixed orthodontic and orthopedic appliances and fabrication of appliances, springs and arches and indirect bonding and orthodontic implants

Evaluation: Practical final exam at "shows how" level

Subtitles

1. Welding and soldering of:
   -A cube with sides measuring 3cm with a wiremeasuring 1mm in diameter
   -Welding and soldering on them
2. Fabrication of loops and multi-loops
   -Fabrication of arch wires with 016 SS wire in the upper and lower jaw in multi-loop shape with these loops
   *Vertical loop
   *Box loop
   *Boot loop
   *T loop
   *Stoner Drag loop
3. Fabrication and formation of bands and welding attachments
   -Fabrication of bands on molars and premolars on both sides
   -Implementation of lingual sheets on maxillary molars
4. Fabrication of ideal arch wires with round and rectangular wires
5. Fabrication of these appliances
   -Maxillary palatal bars and their soldering
   -Mandibular lingual arches and their soldering
   -Maxillary Quad Helix
   -Sliding Jig
   -Pendulum
   -Hyrax on casts

-Nance on casts
-Fix habit breakers on casts

6. Fabrication of these springs and arches:
   -Canine retraction spring with vertical and T loops
   -Burstonetourqing spring
   -Closing loop spring with vertical, delta, T, opus, mushroom loops
   -Burstone intrusion arch
   -Utility arch
   -Auxiliary Ar springs
   -Beggupprighting springs
7. Familiarity with indirect bonding and its implementation
8. Familiarity with implementation of mini-screws on models

Unit title: TypoDont

Unit code: 21

The number of units: 4units (practical)

Unit type: Specialized science

Aims: Practical familiarity with fixed orthodontic workflow in the treatment of different orthodontic disorders on TypoDont

Evaluation: Practical final exam at "shows how" level

Subtitles

1. Implementation of prefabricated bands on upper and lower molars in TypoDont
2. Implementation of brackets on upper and lower plaster casts with sticky wax
   -With edge-wise standard technique
   -With straight wire technique
3. Familiarity with self- ligating brackets
4. Implementation of treatment on models with malocclusion type I, moderate crowding with 4mm of overbite by moderate anchorage and extraction of 4 first premolars

   A. alignment:
   -Lower arch: 1) 0175 Twist
   2) 016 SS
   -Upper arch: 1) 014 Multi-loop
   2) 016 SS
   -Other choice: 016 A-NiTi

   B. Leveling by extrusion:
   - 1) 016 SS Reverse curve of Spee
   - 1) 018 SS (if needed)
   - Other choices: 016 or 018 M-NiTi

   C. Space closing:
   -Lower arch: Delta closing loop 16*22 SS
   -Upper arch: Tear-drop closing loop 16*22 SS
   - Other choice: *Opus closing loop

   * Tclosing loop 16*22 SS or TMA

D. Finishing: 1) 016 SS ideal arch wire
2) 16*22 SS ideal arch wire

5. Implementation of treatment on models with class I malocclusion and severe crowding with first left upper molar rotation by :
-Maximum anchorage
-Extraction of four first premolars
-Segmental upper canine retraction
-Sliding of lower canines
-Banding of upper second molars
-With palatal arch:
A. Alignment:
-lower arch: 1) 0175 Twist
2) 016 SS
-upper arch: 1) 014 Multi-loop
2) 016 SS
-Other choice: 016 A-NiTi
B. Leveling by extrusion:
- 1) 016 SS Reverse curve of Spee
- 1) 018 SS (if needed)
- Other choices: 016 or 018 M-NiTi
C. Space closing:
-Lower arch: Delta closing loop 16*22 SS
-Upper arch: Tear-drop closing loop 16*22 SS
- Other choice: *Opus closing loop
* T closing loop 16*22 SS or TMA
D. Finishing: 1) 016 SS ideal arch wire
2) 16*22 SS ideal arch wire
6. Implementation of treatment on models with group 1 class II malocclusion, moderate crowding, normal bite, class II molar and canine relation and maxillary arch tightness by :
-Upper molar bonding
-Upper first premolar extraction
-Palatal arch:
A. Alignment
1) 0175 Twist

2) 0.9 mm max overlay for expansion
3) 016 SS
4) Removable overlay→ transpalatal arch
5) Extraction of the first Premolar
Other choices: 016 A) NiTi→ 016 SS

B. Leveling: 1) 016→ 018 (if needed)

C. En mass retraction
1) Opus 70 closing loop

D. Finishing

7. Implementation of treatment on group 2 class II malocclusions with lingualized lower second premolars, severs Spee curve and severe deep bite by:
- Extraction of upper first premolars
- Second molar banding
- Upper jaw maximum anchorage
- non-ext lower jaw

A. Alignment

Lower arch: 1) 0175 Twist
2) 016 ss
3) 16*22 Segmental

Upper arch : 1) 0175 Twist
2) 014 SS→ 016 SS→ 16*22
3) Palatal bar 09
4) Intrusion of central incisor by BIA
5) Aligning incisor 0175, 016

B. Leveling

Lower arch: 1) Utility intrusion arch 18*25
Lingual arch 09mm
Post segment: 16*22
Ant segment: 16*22
2) 0175 Twist
3) 016ss→ 018ss

Upper arch: Burstone intrusion arch 18*25
Intrude canine

C. Space closing

1) T loop closing loop 16*22

Other Choice: Delta, Opus 70, tear-drop closing loop

D. Finishing

Upper:

1. Auxiliary ant root torque spring 17*25 SS
2. Base arch 16*22 SS
3. Ideal arch wire 16*22 SS

Lower:

Ideal arch wire 16*22 SS

8. Implementation of treatment on group 1 class II malocclusion with moderate crowding and moderate deep bite by straight wire and extraction of first premolars:

A. Alignment and leveling

1) Lower arch: 014 NiTi or Hant with lace back

2) Upper arch: 016 NiTi of Hant with lace back

B. Space closing

1) Lower arch: Active tie-back with O-ring

2) Upper arch: Active tie-back with NiTi spring and cl II E

Other choices: H. G+ATB in the lower arch with cl III E & ATB in the upper arch with cl II E

C.Finishing

Lower arch: 014 Hant

Upper arch: 014 sectional with elastic for setting

Unit title: Fixed technique 1
Unit code: 22
The number of units: 1unit (theoretical)
Unit type: Specialized science
Aims: Familiarity with various fixed therapeutic orthodontic techniques
Evaluation: Written exam or essay

Subtitles

1. Familiarity with fixed orthodontic appliances
2. Familiarity with standard edgewise technique
3. Familiarity with modern Begg technique
4. Familiarity with Burstone segmented technique

Unit title: Fixed technique 2
Unit code: 23
The number of units: 2units (theoretical)
Unit type: Specialized science
Aims: Familiarity with new various fixed therapeutic orthodontic techniques
Evaluation: Written exam or essay

Subtitles

1. Familiarity with lingual orthodontics technique
2. Familiarity with Tweed Merrifield technique
3. Familiarity with self-ligation technique
   -Speed
   -Inovation
   -Damon
4. Familiarity with straight wire appliance technique
   -Andrews
   -Roth
   -MBT

Unit title: Principles of removable appliances

Unit code: 24

The number of units: 2units (theoretical)

Unit type: Specialized science

Aims: Familiarity with principles and techniques of removable appliances in orthodontics

Evaluation: Written exam or essay

Subtitles

1. Familiarity with removable orthodontic appliances (principles, mechanisms, types)
2. Familiarity with functional appliances (principles, mechanisms, functions, types)
   -Bionator and Activator
   -Franckel
   -Twin block
   -Farmand
3. Familiarity with headgear appliances (principles, mechanisms, types)
   -High pull
   -Low pull
   -Occipital
   -Reverse pull
4. Familiarity with integrated functional and headgear appliances
5. Familiarity with Facemask and chincup appliances
6. Familiarity with fix functional appliances

Unit title: Treatment theoretical 1

Unit code: 25

The number of units: 2units (theoretical)

Unit type: Specialized science

Aims: Familiarity with principles of preventive, interstitial and growth modification treatment planning

Evaluation: Written exam

Subtitles

1. Preventive orthodontic
   -Oral habits
   -Occlusal equilibration
   -Space maintenance
2. Interceptive orthodontics
   -Guidance of occlusion (serial extraction)
   -Space regaining
   -Correction of developing cross bite
3. Growth modification
   A. Class II malocclusion:
      -Headgears
      -Functional appliances
   B. Class III malocclusion
      -Facemask
      -Functional appliances
      -Orthopedic chin cup
4. Class I malocclusion treatment
   A. Non-extraction
      -Various maxillary expansion
      -Mandible expansion appliances
   B. Extraction

Unit title: Treatment theoretical 2

Unit code: 26

The number of units: 2units (theoretical)

Unit type: Specialized science

Aims: Familiarity with various orthodontic disorders in sagittal, transverse and vertical dimensions

Evaluation: Written exam or essay

Subtitles

1. Sagittal disorders treatment
   A. Class II malocclusion
      -Dental
      -Skeletal
      -Treatment with fixed appliances with or without extraction (camouflage treatment)
      -Surgical treatment
   B. Class III malocclusion
      -Dental
      -Skeletal
      -Mendacious
      -Surgical treatment
2. Treatment of transverse disorders
      -Dental
      -Skeletal
      -Lingual crossbite
      -Buccal crossbite
3. Treatment of vertical disorders
   A. Deep overbite
      -Dental
      -Skeletal
      -Collapsed bite
   B. Open bite
      -Dental
      -Skeletal

Unit title: Treatment theoretical 3

Unit code: 27

The number of units: 1 unit (theoretical)

Unit type: Specialized science

Aims: Familiarity with various adjunctive orthodontic treatments of adult patients and skeletal anchorage techniques

Evaluation: Written exam or essay

Subtitles

1. Adjunctive treatments
   -Uprighting posterior teeth
   -Crossbite correction
   -Forced eruption
   -Alignment of anterior teeth
2. Adult interdisciplinary therapy
   -Goals
   -Diagnosis
   -Treatment process
      -Skeletal assessment
      -Periodontal preparation
      -Restorative considerations
      -Retention of the results
   -Treatment and clinical management
   -Behavioral management
   -Establishing contact with other members of the treatment team
3. Modern treatment techniques by temporary anchorage devices (TAD)
   -Biological considerations
   -Diagnosis and treatment planning
   -Principles and biomechanical considerations
   -Clinical indications
   -Skeletal anchorage

Unit title: Orthosurgery

Unit code: 28

The number of units: 2 units (theoretical)

Unit type: Specialized science

Aims: Familiarity with various orthodontic treatments in patients requiring concomitant orthodontic and surgical treatments

Evaluation: Written exam or essay

Subtitles

1. Psychosocial considerations in orthosurgery patients
2. Treatment planning
3. Special considerations in orthosurgery treatment from beginning to end
4. Pre-surgical cephalometric prediction
5. Orthosurgery treatment in skeletodental disorders
   -Anteroposterior
   -Vertical
   -Transverse
   -Asymmetries
6. Distraction osteogenesis
7. Adjunctive (aesthetic facial procedure)
8. Postsurgical orthodontic management of orthognathic patients

Unit title: Occlusion development
Unit code: 29
The number of units: 1 unit (theoretical)
Unit type: Specialized science
Aims: Familiarity with the development of dental arch occlusion in human beings
Evaluation: Written exam or essay

Subtitles

1. Occlusion form and function development in man
2. Postnatal development
3. Modifications in deciduous, mixed and permanent teeth
4. Correlation between craniofacial growth and occlusion development
5. Tooth eruption sequence and mechanisms and natural modifications in this process
6. Teeth, dental arch, growth and development and their patterns and effective factors
7. Ideal occlusion and factors affecting this development

Unit title: Growth and development

Unit code: 30

The number of units: 1 unit (theoretical)

Unit type: Specialized science

Aims: Familiarity with embryological principles of head and face bone and soft tissue growth steps and types of growth assessment

Evaluation: Written exam or essay

Subtitles

1. Familiarity with organogenesis
   -Cephalic region modifications
   -Visceral region modifications (primary mouth, oro-nasal cavity process modifications)
   -Growth and development of neuromuscular system
   -Fetogenesis
   -Bone and cartilage
2. Familiarity with growth theories
3. A review of craniofacial growth and development
4. Familiarity with basic principles of growth
5. Cognition of developmental sequence
6. Familiarity with growth of the lower jaw
7. Familiarity with nasomaxillary complex
8. Familiarity with neurocranium
9. Familiarity with the form and pattern of the face
10. Familiarity with human face pattern and its natural modifications and basis of malocclusions
11. Familiarity with racial differences of face form
12. Familiarity with face growth control techniques

Unit title: Retention and Relapse

Unit code: 31

The number of units: 1 unit (theoretical)

Unit type: Specialized science

Aims: Familiarity with types of retainers and its indications and relapse reasons in orthodontics

Evaluation: Written exam or essay

Subtitles

1. History and etiology
-Occlusion theory
-Apical based theory
-Mandibular incisor theory
-Musculature theory
2. Basic theories related to retention and relapse
-Intention to relapse
-Habit elimination
-Over-correction
-Tissue reorganization
-Soft tissue
-PDL
-Arch form preservation
-Apical based theory
-Growth pattern and treatment time
3. Factors affecting retention and relapse
-Tooth size discrepancy
-Relation of third molars
-Growth factors
-Sexual differences
4. Various retentionsrequired for special malocclusions
5. Retention appliances
6. Retention with clear plastic appliances

Unit title: Syndromes and lip and palate clefts

Unit code: 32

The number of units: 2 units (theoretical)

Unit type: Specialized science

Aims: Familiarity with common syndromes and cleft lip and palate and their orthodontic treatments

Evaluation: Written exam or essay

Subtitles

1. Familiarity with common facial and cranial syndromes such as: Craniofacial synostosis, craniomandibularsynostosis, craniofacial microstomia, Pierre Robin syndrome/sequence
2. Orthodontic management of craniofacial syndromes
3. Diagnosis
   -Prenatal diagnosis of cleft lip and palate
   -Diagnosis of orofacial clefts
4. Team approach
5. Orthodontist's role in:
   -Neonatal and infant period (birth to 2 years of age)
   -Primary dentition period (2−6 years of age)
   -Mixed dentition period(7−12 years of age)
   -Permanent dentition period
6. Orthognathic surgeries and the role of orthodontists
7. Nasoalveolar molding
8. Ear disorders in children with cleft palate
9. Speech in children with cleft palate
10. Facial growth in children with cleft palate
11. Types of clefts

Unit title: Biomaterials

Unit code: 33

The number of units: 1 unit (theoretical)

Unit type: Specialized science

Aims: Familiarity with structure of materials and alloys used in orthodontics

Evaluation: Written exam or essay

Subtitles

1. Physical and chemical characteristics of materials
   -Atoms
   -Molecules
   -Crystals
   -Grains
   -Lattices
   -Lattice deformation
   -Polymorphism
   -Twining
   -Transitions
   -Phases
   -Affinity
   -Chemical bonding
2. Metals
   -Stainless steels
   -Titanium and its alloys (NiTi)
   -Brazing alloys
   -Orthodontic implants
3. Organic polymers
   -Acrylic resin
   -Polyurethane
4. Inorganic polymers (ceramics)
   -Oxides
   -Glasses
5. Composites and blends
   -Resin composites
   -Glass-ionomers

-Compomers
-Composite brackets

6. Familiarity with elastomeric materials in orthodontics
7. Familiarity with nanomaterials in orthodontics

Unit title: Occlusion and TMJ disorders

Unit code: 34

The number of units: 1 unit (theoretical)

Unit type: Specialized science

Aims: Familiarity with occlusion theories and its goal in orthodontics and diagnosis and management of TMJ disorders related to orthodontic treatments

Subtitles

1. A review to occlusion theories in man and its types (group function, cuspid rise, etc.)
2. Familiarity with static and functional occlusion theories
3. Occlusion goals in contemporary orthodontics
4. Orthopedic stability principles
5. Finding a musculoskeletally stable position
6. Evaluation of the patient from TMD viewpoint
   -Screen history
   -Clinical examination
7. Treatment planning and management of orthodontic and TMJ disorders
8. Facial pain differential diagnosis
9. Management of temporomandibular symptoms occurring during orthodontic treatment
10. Familiarity with TMJ disorders related to malocclusions

Unit title: Patient presentation (Treatment planning and result assessment)

Unit code: 35, 36, 37, 38

The number of units: 4 units (practical)

Unit type: Specialized science

Aims: Presentation of patients in case presentation sessions in the presence of all theprofessors and residents for the purpose of treatment planning and result assessment

Evaluation: Direct observation of case presentation and assessment with the use of a checklist

Subtitles

Presentation of at least 4 patients in every semester at case presentation sessions regarding evidence-based dentistry methods (Performance method is determined by the university departments)

Unit title: Clinical treatment

Unit code: 39, 40, 41, 42, 43

The number of units: 43 units (practical)

Unit type: Specialized science

Aims: Acquiring skill in admission, diagnosis and treatment of patients with various orthodontic disorders by residents

Evaluation: Assessment of students' performance at "Show how" level with subsequent means such as OSCE or at "Does" level with suitable tools (such as DOPS, MiniCEx)

Subtitles

1. Starting at least 30 cases of fixed and 5 cases of removable orthodontic treatment and 5 cases of orthosurgery
2. Treating at least 20 transferred and 10 recall patients
3. Every resident should terminate at least 50% equal to 20 new patients and at least 70% transferred patients
4. Classification of malocclusion for residents:
   -Class I malocclusion: 10 cases (including extraction and non-extraction)
   -Class II malocclusion: 10 cases (including Cl II div 1, Cl II div 2, long face, short face, ext and non-ext)
   -Class III malocclusion: 5 cases (surgical and nonsurgical)
   -Vertical problems: 5 cases
   -Transverse problems: 5 cases
   - Other specialized cases: 5 cases (including dental impactions, cleft patients, etc.)
   -Distribution of each casedepends on the facilities of each department

Unit title: Thesis

Unit code: 44, 45, 46, 47

The number of units: 12 units (practical)

Unit type: Specialized science

Aims: Registration of postgraduate thesis subject at the end of the first year, conducting the approved research project under the professor's supervision, termination of the approved research project and preparing the thesis under the professor'ssupervision and defending it

Evaluation: Dissertation

Subtitles

1. Subject selection under the professor'ssupervision
2. Proposal writing under the professor'ssupervision
3. Getting the subject and proposal approved by the department and faculty research council
4. Registration of the approved subject in the Office of Educational Affairs
5. Conducting the research according to the approved methods and materials under the professor'ssupervision
6. Presenting the progress report to the professor and postgraduate officer of the department and the faculty
7. Terminating the research according to the approved methods and materials under the professor'ssupervision
8. Writing the thesis under the professor'ssupervision
9. Writing at least 1 article based on the conducted research under the professor'ssupervision
10. Publication or submission of the article in reliable scientific journals
11. Defending the thesis