

**In the Name of God**



**Islamic Republic of Iran  
Ministry of Health and Medical Education  
Deputy for Education**

**Oral and Maxillofacial Radiology**  
Degree: Specialty equivalent to Master of Science (MSc)

**Revised year: 1392/2014**

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## **Total Course Credits**

- Common basic sciences: 9.5
- Specific basic sciences: 1
- Faculty-presented related sciences 6
- Hospital-presented related sciences 13
- Core courses 93

## **Program Description**

### **Definition**

Oral and maxillofacial radiology is one of the specialty courses in dentistry, which deals with the principles of physics and radiation protection, imaging techniques and interpretation of lesions. Graduates passing the specialty exams held by the authorities of the Ministry of Health, Treatment and Medical Education will be certified as oral and maxillofacial radiologists.

### **The General Aim**

The aim of the curriculum in the field of oral and maxillofacial radiology is to train specialists who have achieved the standards of knowledge, beliefs and opinions and practical skills up to national and global standards. In addition, the graduates should be able to provide high-quality diagnostic services and have an active role in expanding the boundaries of knowledge and research within the framework of their specialty field.

### **The Specific Aims**

The graduates of the oral and maxillofacial radiology specialty course should have acquired following skills:

- Complete mastery of the principles of the physics of imaging, radiobiology, radiation protection, and intraoral and extraoral imaging in the oral and maxillofacial region
- Complete mastery of the normal radiologic features and changes in disease conditions and interpretation of different radiographic images of the oral and maxillofacial region
- Active participation in educational and research affairs of the field

### **Admission Requirements**

- Holding an DDS or DMD degree
- Having passed the National Entrance Exam

## **Expected Competencies at the End of the Program**

### **General Competencies\***

#### **Specific Competencies and Skills**

At the end of the program learners will be competent in the following skills:

- Perform imaging procedures in oral and maxillofacial field
- Interpret dental and medical images in the field of face and related structures
- Manage an oral and maxillofacial radiology service
- Research in related fields
- Instruct in oral and maxillofacial field

## **Educational Strategies, Methods and Techniques\***

### **Student Assessment (Methods and Types)**

- Formative
- Summative
- Comprehensive exam

### **Ethical Considerations\***

\*Note: The related document(s) can be found at <http://hcmep.behdasht.gov.ir/>.

## Tables of the Courses

**Table 1. The common basic sciences courses in Oral and Maxillofacial Radiology MSc**

Code of the course	Course title	Units and the course types			Total hours of the courses			Total units
		Theoretical	Practical	Workshop	Theoretical	Practical	Workshop	
1	Medical education (1)	-	-	1	-	-	51	1
2	Medical education (2)	-	-	2	-	-	102	2
3	Research methods and EBD	-	-	2	-	-	102	2
4	Clinical photography*	-	-	1	-	-	51	1
5	Medical emergencies*	-	-	0.5	-	-	51	0.5
6	Medical laws and professional ethics*	-	-	1	-	-	51	1
7	Infection control and patient safety*	-	-	1	-	-	51	1
8	Clinical management and authority	-	-	1	-	-	51	1
<b>Total</b>		-	-	<b>9.5</b>	-	-	<b>510</b>	<b>9.5</b>

\*These courses are optional and the post-graduate students should select at least 1 unit.

**Table 2. The specific basic sciences courses in Oral and Maxillofacial Radiology MSc**

Code of the course	Course title	Units and the course types			Total hours of the courses			Total units
		Theoretical	Practical	Workshop	Theoretical	Practical	Workshop	
9	Head and neck anatomy	-	1	-	-	34	-	1
<b>Total</b>		-	<b>1</b>	-	-	<b>34</b>	-	<b>1</b>

**Table 3. The faculty-presented related sciences courses in Oral and Maxillofacial Radiology MSc**

Code of the course	Course title	Units and the course types			Total hours of the courses			Total units
		Theoretical	Practical	Workshop	Theoretical	Practical	Workshop	
10	Osteology	-	1	-	-	34	-	1
11	Oral and maxillofacial pathology	-	2	-	-	68	-	2
12	Principles of dental implants	-	1	-	-	34	-	1
13	Oral and maxillofacial diseases	-	2	-	-	68	-	1
<b>Total</b>		-	<b>6</b>	-	-	<b>204</b>	-	<b>6</b>

**Table 4. The hospital-presented related sciences courses in Oral and Maxillofacial Radiology MSc**

Code of the course	Course title	Units and the course types			Total hours of the courses			Total units	Prerequisite
		Theoretical	Practical	Workshop	Theoretical	Practical	Workshop		
14	Diseases of ear nose and throat	-	2	-	-	68	-	2	
15	Head and neck imaging (1)	-	3	-	-	102	-	3	
16	Head and neck imaging (2)	-	3	-	-	102	-	3	15
17	Head and neck imaging (3)	-	3	-	-	102	-	3	16
18	Oral and maxillofacial surgeries	-	2	-	-	68	-	2	
<b>Total</b>		-	<b>13</b>	-	-	<b>442</b>	-	<b>13</b>	-

**Table 5. The core courses in Oral and Maxillofacial Radiology MSc**

Code of the course	Course title	Units and the course types			Total hours of the courses			Total units	Prerequisite
		Theoretical	Practical	Workshop	Theoretical	Practical	Workshop		
19	Applied anatomy	1	-	-	17	-	-	1	
20	Case presentation (1)	-	2	-	-	68	-	2	
21	Case presentation (2)	-	2	-	-	68	-	2	20
22	Case presentation (3)	-	2	-	-	68	-	2	21
23	Case presentation (4)	-	2	-	-	68	-	2	22
24	Case presentation (5)	-	2	-	-	68	-	2	23
25	The principles of special imaging techniques (CT, MRI, ultrasound, MRI)	1	-	-	17	-	-	1	
26	Literature review (1)	1	-	-	17	-	-	1	
27	Literature review (2)	1	-	-	17	-	-	1	26
28	Literature review (3)	1	-	-	17	-	-	1	27
29	Literature review (4)	1	-	-	17	-	-	1	28
30	Literature review (5)	1	-	-	17	-	-	1	29
31	Literature review (6)	1	-	-	17	-	-	1	30
32	Thesis (1)	-	-	2	-	-	102	2	
33	Thesis (2)	-	-	2	-	-	102	2	31
34	Thesis (3)	-	2	-	-	68	-	2	32
35	Thesis (4)	-	-	2	-	-	102	2	33
36	Thesis (5)	-	-	2	-	-	102	2	34
37	Interpretation of lesions (1)	4	-	-	68	-	-	4	35
38	Interpretation of lesions (2)	4	-	-	68	-	-	4	
39	Interpretation of lesions (3)	4	-	-	68	-	-	4	
40	Interpretation of lesions (4)	4	-	-	68	-	-	4	
41	Interpretation of lesions (5)	4	-	-	68	-	-	4	
42	Interpretation of lesions (6)	4	-	-	68	-	-	4	
43	Interpretation of lesions (1)	-	2	-	-	68	-	2	
44	Interpretation of lesions (2)	-	2	-	-	68	-	2	
45	Interpretation of lesions (3)	-	2	-	-	68	-	2	
46	Interpretation of lesions (4)	-	2	-	-	68	-	2	
47	Interpretation of lesions (5)	-	2	-	-	68	-	2	
48	Interpretation of lesions (6)	-	2	-	-	68	-	2	

49	Radiobiology and radiation protection	2	-	-	34	-	-	2	
50	Intraoral radiography	1	-	-	17	-	-	1	
51	Intraoral radiography (1)	-	1	-	-	34	-	1	
52	Intraoral radiography (2)	-	1	-	-	34	-	1	51
53	Intraoral radiography (3)	-	1	-	-	34	-	1	52
54	Extraoral radiography	1	-	-	17	-	-	1	
55	Extraoral radiography (1)	-	1	-	-	34	-	1	
56	Extraoral radiography (2)	-	1	-	-	34	-	1	55
57	Extraoral radiography (3)	-	1	-	-	34	-	1	56
58	Extraoral radiography (4)	-	1	-	-	34	-	1	57
59	Extraoral radiography (5)	-	2	-	-	68	-	2	58
60	Intra-department seminar (1)	-	-	1	-	-	51	1	
61	Intra-department seminar (2)	-	-	1	-	-	51	1	60
62	Intra-department seminar (3)	-	-	1	-	-	51	1	61
63	Intra-department seminar (4)	-	-	1	-	-	51	1	62
64	Intra-department seminar (5)	-	-	1	-	-	51	1	63
65	Physical principles of imaging	3	-	-	51	-	-	3	
66	Participation in training students (1)	-	2	-	-	-	68	2	
67	Participation in training students (2)	-	2	-	-	-	68	2	66
68	Participation in training students (3)	-	2	-	-	-	68	2	67
69	Participation in training students (4)	-	2	-	-	-	68	2	68
<b>Total</b>		<b>39</b>	<b>41</b>	<b>13</b>	<b>663</b>	<b>1394</b>	<b>663</b>	<b>93</b>	<b>-</b>

## The core courses recommended ordering in oral and maxillofacial radiology MSc

First Semester			
No.	Course Title	No. of units	Course Type
1	Osteology	1	Practical
2	Oral and maxillofacial pathology	2	Practical
3	Medical education 1	1	Workshop
4	Literature review 1	1	Theoretical
5	Oral and maxillofacial disease	2	Practical
6	Practical interpretation of lesions 1	2	Practical
7	Theoretical interpretation of lesions 1	4	Theoretical
8	Intraoral radiography	1	Theoretical
9	Practical intraoral radiography 1	1	Practical
10	Research methodology and EBD	2	Workshop
11	Seminar in radiology department 1	1	Workshop
	Total	18	-

Second Semester			
No.	Course Title	No. of units	Course Type
12	Case presentation 1	2	Practical
13	Medical education 2	2	Workshop
14	Literature review 2	1	Theoretical
15	Thesis 1	2	Workshop
16	Head and neck anatomy	1	Practical
17	Practical interpretation of lesions 2	2	Practical
18	Theoretical interpretation of lesions 2	4	Theoretical
19	Radiobiology and radiation protection	2	Theoretical
20	Extraoral radiography	1	Theoretical
21	Practical extraoral radiography 1	1	Practical
22	Practical intraoral radiography 2	1	Practical
23	Seminar in radiology department 2	1	Workshop
24	Physical basics of imaging	1	Theoretical
	Total	23	-



<b>Third Semester</b>			
<b>No.</b>	<b>Course Title</b>	<b>No. of units</b>	<b>Course Type</b>
25	Case presentation 2	2	Practical
26	Principles of dental implants	1	Practical
27	Literature review 3	1	Theoretical
28	Ear, nose and throat diseases	2	Practical
29	Thesis 2	2	Workshop
30	Practical interpretation of lesions 3	2	Practical
31	Theoretical interpretation of lesions 3	4	Theoretical
32	Practical extraoral radiography 2	1	Practical
33	Practical intraoral radiography 3	1	Practical
34	Seminar in radiology department 3	1	Workshop
35	Clinical management and authority	1	Workshop
36	Participation in student training 1	2	Practical
	Total	20	-

<b>Fourth Semester</b>			
<b>No.</b>	<b>Course Title</b>	<b>No. of units</b>	<b>Course Type</b>
37	Case presentation 3	2	Practical
38	Principles of Specialized imaging techniques	1	Theoretical
39	Applied anatomy	1	Theoretical
40	Literature review 4	1	Theoretical
41	Thesis 3	2	Practical
42	Head and neck imaging 1	3	Practical
43	Practical interpretation of lesions 4	2	Practical
44	Theoretical interpretation of lesions 4	4	Theoretical
45	Oral and maxillofacial surgery	2	Practical
46	Practical extraoral radiography 3	1	Practical
47	Seminar in radiology department 4	1	Workshop
48	Participation in student training 2	2	Practical
	Total	22	-

Fifth Semester			
No.	Course Title	No. of units	Course Type
49	Case presentation 4	2	Practical
50	Literature review 5	1	Theoretical
51	Thesis 4	2	Workshop
52	Head and neck imaging 2	3	Practical
53	Practical interpretation of lesions 5	2	Practical
54	Theoretical interpretation of lesions 5	4	Theoretical
55	Practical extraoral radiography 4	1	Practical
56	Seminar in radiology department 5	1	Workshop
57	Participation in student training 3	2	Practical
	Total	18	-

Sixth Semester			
No.	Course Title	No. of units	Course Type
58	Case presentation 5	2	Practical
59	Literature review 6	1	Theoretical
60	Thesis 5	2	Workshop
61	Head and neck imaging 3	3	Practical
62	Practical interpretation of lesions 6	2	Practical
63	Theoretical interpretation of lesions 6	4	Theoretical
64	Practical extraoral radiography 5	2	Practical
65	Participation in student training 4	2	Practical
	Total	18	-

Optional Courses *				
No.	Course Title	No. of units	Course Type	Recommended Semester
66	Clinical photography	1	Workshop	2nd
67	Medical emergencies	0.5	Workshop	2nd
68	Professional ethics and forensic medicine	1	Workshop	3th
69	Principles of infection control and patients safety	1	Workshop	1st
	Total	3.5		-

\* Taking one of these courses is mandatory

**Course title:** Medical education 1      **Course No:** 1

**Type and unit of the course:** 1 workshop unit

**Training hours:** 51 hours

**Prerequisite and simultaneous courses:** None

**Main objectives:** The overall objectives of medical Education 1 and 2 is to train the assistant for participating in teaching and examinations of theoretical, workshop, Clinical and preclinical courses in their own expertise field

**Course topics (contents):**

1. The role of science committee member in teaching
2. The principles of teaching and learning
3. Type of learning
4. The teaching process skills.
5. Professor specifications and duties
6. Lesson plan
7. Teaching objectives
8. The principles of preparing the lesson contents
9. The speech text
10. Questions and answers text
11. Teaching in small groups
12. Different methods of group training
13. Role playing and simulations
14. Teaching in the clinic
15. Teaching aid tools
16. Smart boards
17. PowerPoint preparation

**Course Title:** Medical Education 2 **Course No:** 2

**Type and units of the course:** 2 workshop units

**Training hours:** 102 hours

**Prerequisite and Simultaneous course:** Medical education 1

**Main objectives:** The overall objectives of Medical Education 1 and 2 Is to train the assistant for participating in teaching and examination of theoretical, workshop, pre-clinical and clinical courses in their own expertise field.

**Course Topics (contents):**

1. Professional lesson plans
2. Student evaluations and its methods
3. Multiple-choice questions
4. Written question
5. Classification of exam question
6. In –action evaluation
7. Dops design
8. OSCE exams
9. Oral exam
10. Question analysis
11. Program evaluation
12. Course planning
13. Log book
14. Port folio
15. Learning competency-based approach
16. Standard patent
17. Integration in Education

**Course title:** Research methodology and EBD **Course No:** 3

**Type and units of the course:** 2 workshop units

**Training hours:** 102 hours

**Prerequisite and Simultaneous course:** None

**Main objectives:** Learning the academic research basics and research methods in training and learning the skills in publishing the research founding Content topics of research methodologies and EBD along with teaching-learning methods.

**Content topics of workshop research methodology and EBD course along with teaching-learning method:**

No.	Content topics	Teaching- learning method	Teaching hours
1	Research basics and evidence- based dentistry and the principles of question designing in evidence- based dentistry	Problem oriented lecture	3
2	Literature review	Problem oriented lecture	6
3	Search engines and practical and important websites in dentistry	Workshop	6
4	Introduction of scientific resources management softwares in various studies of dentistry researches	Practical	9
5	Different kinds of studies in dentistry researches	Interactive presentation	3
6	Descriptive studies	Oral presentation, small group discussion	3
7	Measurement indicators of health and disease	Problem oriented lecture	3
8	Measurement indicators of relationship	Problem oriented lecture	3
9	Principles of analytical-observational studies	Oral presentation	3
10	Interventional studies	Problem oriented lecture	3
11	Review studies	Oral presentation	3
12	Evaluation of diagnostic tests	Problem oriented lecture	3
13	Errors and reasoning	Problem oriented lecture	3
14	Basics of descriptive statistics	Problem oriented lecture	6
15	Estimation and testing of hypothesis	Problem oriented lecture	6
16	Critical evaluation	Oral presentation	3
17	Prioritization and subject selection and ....	Oral presentation, small group discussion	3
18	Objectives, hypothesis, variables, research management and ethics	Oral presentation, small group discussion	3
19	Surveys and data collecting methods	Oral presentation, small group discussion	3
20	Sampling and sample size calculation	Oral presentation, small group discussion	3
21	Research errors	Problem oriented lecture	3
22	Interaction and research errors	Problem oriented lecture	3
23	Special considerations of cohort studies and case- control studies	Oral presentation, small group discussion	3
24	Special considerations of interventional studies	Oral presentation, small group discussion	3
25	Special considerations of diagnostic tests evaluation	Oral presentation, small group discussion	3
26	Qualitative studies	Problem oriented lecture	3
27	Introduction of statistical test application in dentistry	Problem oriented lecture	6

**Course title:** Clinical photography \* **Course No:** 4

**Type and units of the course:** 1 workshop unit

**Training hours:** 51 hours

**Prerequisite and Simultaneous course:** None

**Main objectives:** Introduction of different photography cameras, taking and saving professional photographs of dental patients.

**Content topics of workshop clinical photography course along with teaching-learning method:**

No.	Content topics	Teaching- learning method	No. of sessions
1	Introduction of different convenient and standard cameras, their applications and using a support	Workshop	1
2	Introduction of different retractors, mirrors and their application	Workshop	1
3	Profile and portrait photography	Workshop	1
4	Extra and intra-oral photography	Workshop	1
5	Making photographs from x-rays and casts	Workshop	1
6	Introduction of 3-D images and making them	Workshop	1
7	Introduction of fixing probable problems during photography in groups and workshop	Workshop	1
8	Performing standard photographs in special fields, preparing and analyzing the photographs (teaching by the related professors)	Workshop	3
9	Performing 3-D images and their analysis (teaching by the related professors)	Workshop	3
10	Superimposition tactics of photographs and radiographs	Workshop	1
11	Introduction of image saving (2-D and 3-D)	Workshop	1
12	Introduction of photography and editing softwares	Workshop	1
13	Slide presentation by PowerPoint	Workshop	1

Resource:

Mastering digital dental photography, 2006

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\* This course is optional.

**Course title:** Medical emergencies \*    **Course No:** 5

**Type and unit of the course:** 0.5 workshop unit

**Training hours:** 24 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Emergencies in dental clinics in skill lab with training on case studies.

**Minimum expected practical skills:** Residents must be fully dominant of actions in case of emergencies and can perform on a standardized patient. To achieve this, a medical emergency treatment flowchart must be exposed on the wall

**Content topics:**

1. Getting the patient's history, medical histories and their role in prevention and diagnosis of emergency actions and exams.
2. Equipments and instruments in emergencies
3. Common emergencies and their treatment methods: including severe allergic reactions, breathing difficulties, changes in levels of consciousness.
4. Heart resuscitation (CPR)
5. Immediate techniques used in circulations-airway breathing
6. Medicine applications in medical emergencies.
7. Applied skills in medical emergencies ( Injections, serum therapy)
8. Introduction of equipments and material available in the section or mutual facilities available in the university.

\* It is recommended that this course is taught by oral and maxillofacial surgery professors in 3-hour workshop classes. (Participation of emergency medicine group members would be helpful.)

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\* This course is optional

**Course title:** Professional ethics and forensic medicine \* **Course No:** 6

**Type and units of the courses:** 1 workshop unit

**Training hours:** 51 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Residents will be trained in basic theory of ethics, Professional commitment toward society and legal rights of patients and colleagues. In this course the attendances will be trained to gain skills in understanding and analyzing ethical issues when happen to be able to make the best decisions either as a therapist or as a professor considering all legal and ethical rules and charters.

**Content topics of professional ethics and forensic medicine along with teaching- learning method:**

No.	Content topics	Teaching- learning method	No. of sessions
1	Applied general ethics and general professionalism	Workshop	1
2	Altruism and respect, career excellence and justice	Workshop	1
3	Integrity, honesty and loyalty	Workshop	1
4	History and philosophy of ethics, four principles of bioethics	Workshop	1
5	Schools and theories of ethics	Workshop	1
6	Diagnostic tools in moral decisions	Workshop	1
7	Informed consent, innocence and determine the capacity of decision alternatives	Workshop	1
8	Confidentiality and honesty	Workshop	1
9	Dentist relationship with other members of health staff	Workshop	1
10	Principles of clinic management, submitting medical records, dentist relationship with patient and entourage	Workshop	1
11	Introduction to medical council, forensic dentistry, responsibility, medical errors and faults, wergild limits	Workshop	1
12	Understanding the implications of certification issuance and the court rules and trial procedures	Workshop	1
13	Conflict of interest	Workshop	1
14	Ethics in training environments	Workshop	1
15	Islamic jurisprudence, traditions and its relationship with ethics in dentistry	Workshop	1
16	Medical ethics challenges	Workshop	1
17	Integrated case presentation	Case presentation and literature review	1

\* Each session is equal to 3 hours of training.

Resources:

1. Clinical ethics: An invitation to healing professionals, William Depender.
2. Professional ethics in health treatment services, Mohammad Mahdi Esfahani.
3. Ethics in medical research, Trevor Smith.
4. Tabibaneh Baray-e Tabiban, Zia-addin Taeie.

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\* This course is optional



**Course title:** Principles of infection control and patient safety \* **Course No:** 7

**Type and units of the courses:** 1 workshop unit

**Training hours:** 51 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Attendances must learn the skills and methods of providing patient safety in dental clinics and hospitals and to be able to perform it in real situations.

**Content topics:**

1. Patient safety
2. Importance of human factors in patient safety
3. Introduction of effective and complicated systems used for patient safety and care
4. Creating and using effective groups
5. Learning from past mistakes to prevent future dangers
6. Introduction and management of medical dangers
7. Quality improvement methods to improve safety
8. More patients contacts with personnel and supervisors
9. Care, prevention and infection control
10. Safety toward infectious diseases
11. Improve drug safety
12. Microbiology of common infectious diseases in dentistry and transmission ways
13. Attending in departments and implement learnt skills \*

In team works each resident works on own department's approaches and discuss about them.

\* This section is taught in 5 integrated sessions simultaneous with clinical performance of resident in department and further evaluation and additional training will be performed by professors. It is expected that with these practices, the important points is fully learnt by residents and are considered in their evaluation in upcoming semesters.

Resource:

Patient safety curriculum guide, Multi professional edition published by the World Health Organization which is available in  
[http://whqlibdoc.who.int/publications/2011/9789241501958\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241501958_eng.pdf)

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\* This course is optional.

**Course title:** Clinical management and authority    **Course No:** 8

**Type and units of the courses:** 1 workshop unit

**Training hours:** 51 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** The attendances will study the models and instruments of service quality management, service sublimation, needs, patient safety, applying management and they must believe in oral health service improvement necessity by implementing models and quality management instruments specially clinical service authority and this must be shown in their performance.

**Minimum expected practical skills:** This is expected from a resident that after this course, who can perform clinical management actions during performing oral health services.

**Content topics of clinical management and authority course along with teaching- learning method:**

No.	Content topics	Teaching- learning method	No. of sessions
1	Quality and their improvement systems	Workshop	1
2	Service quality management of oral health	Workshop	1
3	Authority of clinical services and prerequisites	Workshop	1
4	Quality management tools and models	Workshop	1
5	Patient safety	Workshop	1
6	Clinical efficiency	Workshop	1
7	Concepts of clinical dentistry efficiency based on clinical evidence and audits	Workshop	1
8	Interaction with patients, entourage and society	Workshop	1
9	Education, Training and management of staff	Workshop	1
10*	Improvement in professional service quality	Workshop	5
11*	Evaluation of the realization and implementation of the principles of clinical authority in professional fields	Workshop	3

\* This part is during the clinical service in professional field with this difference that these training classes is held by department professors.

**Course title:** Head and neck anatomy    **Course No:** 9

**Type and units of the courses:** 1 practical unit

**Training hours:** 34 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Noting and deepen the regional anatomy and applied anatomy of the head and neck

**Content topics:**

Introduction of applied regional anatomy of:

- Oral cavity
- Muscles and their connections in the oral cavity and oral it
- Submandibular region
- Sublingual area
- Pharynx
- Nose
- Maxillary and paranasal sinuses
- Salivary glands
- Skin and shaping muscles of the face
- Major and minor masticator muscles
- Temporomandibular joint
- Oral cavity
- Lymph nodes and lymphatic drainages
- Oral and maxillofacial sensory and motor nerves
- Oral and maxillofacial main blood vessels
- Facial spaces
- Maxillofacial bones
- Teeth and alveolar bone

**Course title:** Osteology    **Course No:** 10

**Type and units of the courses:** 1 practical unit

**Training hours:** 34 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Practical training of head and neck bones to present oral and maxillofacial radiologic interpretation.

**Content topics:**

1. Practical study of skull osteology
2. Practical study of cranial bones
3. Practical study of anatomic landmarks
4. Practical study of radiographic findings of skull bones.

**Course title:** Oral and maxillofacial pathology    **Course No:** 11

**Type and units of the courses:** 2 practical units

**Training hours:** 68 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Understanding oral and maxillofacial microscopic and histopathologic bone defects, understanding the local oral and maxillofacial pathologic changes or related to systemic diseases which have radiologic appearance.

**Content topics:**

1. Introduction to histology of bones and jaws
2. Identifying oral cysts (soft and hard tissue)
3. Recognition of odontogenic tumors of the jaws
4. Recognition of non- odontogenic tumors of the jaws
5. Introduction to inflammatory lesions of the jaws
6. Introduction to metabolic and genetic diseases
7. Introduction to salivary glands diseases
8. Identification of lymph node lesions
9. Introduction to oral cancers
- 10 Practical study of histopathologic slides of important jaw lesions as following:
  - Normal Bone
  - Osteosarcoma
  - Chondrosarcoma
  - Calcifying epithelial odontogenic tumor
  - Aneurysmal bone cyst
  - Central giant cell granuloma
  - Burkitt's lymphoma
  - Fibrous dysplasia
  - Paget's disease
  - Osteomyelitis
  - Dental granuloma
  - Odontogenic cysts
  - Adenomatoid odontogenic tumor
  - Odontoma
  - Squamous cell carcinoma
  - Eosinophilic granuloma
  - Juvenile ossifying fibroma
  - Cementoblastoma
  - Odontogenic keratocyst
  - Multiple myeloma

**Course title:** Principles of dental implants    **Course No:** 12

**Type and units of the courses:** 1 practical unit

**Training hours:** 34 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Introduction to surgery procedures and prosthesis preparation in dental implants.

**Content topics:**

1. Introduction to patient selection
2. Learn how to use radiologic images, interaction between surgeons and radiologists
3. Introduction to implant surgery steps
4. Introduction to steps of prosthesis preparation for dental implants
5. Introduction to applications of imaging in prosthesis preparation
6. Introduction to imaging application in post treatment control of dental implants

**Course title:** Oral and maxillofacial diseases    **Course No:** 13

**Type and units of the courses:** 2 practical units

**Training hours:** 68 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Application of diagnostic methods and examination of different oral and maxillofacial regions to help lesions interpretation

**Content topics:**

1. Introduction to preparation and registration of medical history
2. Recognition of laboratory tests
3. Understanding the principles of clinical differential diagnosis of diseases
4. Understanding the pathology of blood disease
5. Identification of systemic disease
6. Practical record the history of patients with special considerations (pregnant women, children, disables, old patients, ...)
  - Intraoral and extraoral lesions examinations
  - Temporomandibular joint examination
  - Facial muscle examination
  - Salivary glands and lymph nodes examination
7. Doing the aspiration

**Course title:** Ear, nose and throat diseases    **Course No:** 14

**Type and units of the courses:** 2 practical units

**Training hours:** 68 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Practical study of treatment and diagnosis methods of ear, nose and throat diseases in oral and maxillofacial radiology.

**Content topics:**

1. Examination and diagnosis of throat diseases
2. Examination and diagnosis of paranasal sinuses diseases
3. Examination and diagnosis of salivary glands diseases



**Course title:** Head and neck imaging 1    **Course No:** 15

**Type and units of the courses:** 3 practical units

**Training hours:** 102 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Practical study of common head and neck imaging methods and their applications in diagnosis and interpretation of oral and maxillofacial lesions.

**Content topics:**

1. Introduction to skull imaging methods and interpretation
2. Introduction to paranasal sinuses imaging methods and interpretation
3. Introduction to temporomandibular joint imaging methods and interpretation
4. Introduction to sialography method and interpretation
5. Introduction to imaging with contrast media (sialography, arthrography, ....) and interpretation
6. Introduction to hospital imaging equipments
7. Observation of radiologic features of jaw lesions including:
  - Tumors
  - Cyst
  - Fractures
  - Congenital lesions

**Course title:** Head and neck imaging 2    **Course No:** 16

**Type and units of the courses:** 3 practical units

**Training hours:** 102 hours

**Prerequisite and simultaneous course:** Head and neck imaging 1

**Main objectives:** Introduction to advanced head and neck imaging methods and their applications in diagnosis and interpretation of oral and maxillofacial lesions.

**Content topics:**

1. Practical introduction to computed tomography (CT) and its applications in oral and maxillofacial imaging and interpretation
2. Practical introduction to tomography technique
3. Practical introductions to MRI and its application in dentistry and interpretation
4. Practical introductions to ultrasonography and sintigraphy and interpretation

**Course title:** Head and neck imaging 3    **Course No:** 17

**Type and units of the courses:** 3 practical units

**Training hours:** 102 hours

**Prerequisite and simultaneous course:** Head and neck imaging 2

**Main objectives:** Introduction to specific head and neck imaging methods and their applications in diagnosis and interpretation of oral and maxillofacial lesions.

**Content topics:**

1. Practical introduction and application of ultrasonography and Doppler sonography in oral and maxillofacial region
2. Practical introduction to nuclear medicine: Jaws and salivary glands scan and interpretation
3. Practical introduction to new imaging equipments PET, SPECT ( In case of availability)
4. Interventional radiology

**Course title:** Oral and maxillofacial surgery    **Course No:** 18

**Type and units of the courses:** 2 practical units

**Training hours:** 68 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Recognition of oral and maxillofacial lesions and practical introduction to diagnosis and treatment methods in mutual field of maxillofacial radiology and surgery.

**Content topics:**

1. Practical introduction to principles of patients examinations
2. Practical introduction to examination and treatment principles of oral and maxillofacial cysts and tumors
3. Practical introduction to examination and treatment principles of oral and maxillofacial malignancies
4. Practical introduction to examination and treatment principles of oral and maxillofacial trauma and fractures
5. Practical introduction to congenital anomalies and facial reconstruction and orthognatic surgery
6. Practical introduction to systemic diseases and their oral and maxillofacial appearances
7. Practical introduction to biopsy of lesions
8. Practical introduction to treatments of temporomandibular joint disorders
9. Practical introduction to treatments of salivary stones
10. Practical introduction to implant planning
11. Practical introduction to treatments of infections
12. Participation in morning report

**Course title:** Applied anatomy    **Course No:** 19

**Type and units of the courses:** 1 theoretical unit

**Training hours:** 17 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Empowerment to identify anatomic landmarks of common and new imaging modalities ( CT, MRI)

**Content topics:**

1. Study the anatomic regions by conventional hard tissue imaging methods (Panoramic, Lateral cephalometry, TMJ tomography) and soft tissue imaging method (Sialography)
2. Study the anatomic regions of maxillofacial hard tissues (Paranasal sinuses, Maxilla, Mandible, TMJ, ... ) by CT
3. Study the anatomic regions of maxillofacial soft tissues (Masticatory muscles, Salivary glands, Articular disc of TMJ, ... ) by CT
4. Study the anatomic regions of maxillofacial and TMJ (Masticatory muscles, Salivary glands, Articular disc of TMJ and reterodiscal tissues) by MRI

**Course title:** Case presentation 1 to 5    **Course No:** 20-24

**Type and units of the courses:** 10 practical units (2 units each semester)

**Training hours:** 680 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Presentation and interpretation of oral and maxillofacial lesions

**Content topics:**

1. Pathologic case presentation (minimum 30 cases)
2. Maxillofacial case presentation (minimum 30 cases)
3. Maxillofacial congenital disorders case presentation (minimum 30 cases)
4. Implant failure case presentation (minimum 30 cases)

**Course title:** Principles of specialized imaging techniques (CBCT, CT, Sonography, MRI)

**Course No:** 25

**Type and units of the courses:** 1 theoretical unit

**Training hours:** 17 hours

**Prerequisite and simultaneous course:** None

**Content topics:**

1. Introduction to principles of CBCT, CT, sonography and MRI techniques
2. Introduction to applications of mentioned techniques.

**Course title:** Literature review 1 to 6    **Course No:** 26-31

**Type and units of the courses:** 6 theoretical units (1 unit each semester)

**Training hours:** 102 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Review and evaluation of reliable national and international papers in oral and maxillofacial field to obtain new information and research methods in accordance with radiobiology, protection, physics of radiation, imaging modalities and interpretation of lesions.

**Content topics:**

1. Introduction to scientific paper writing
2. Introduction to Persian and English paper review and presentation
3. Introduction to paper evaluation methods and convenient concluding of evaluated papers
4. Introduction to paper classification



**Course title:** Thesis 1 to 5    **Course No:** 32-36

**Type and units of the courses:** 10 practical- workshop units

**Training hours:** 476 hours

**Prerequisite and simultaneous course:** None

**Thesis 1- Objective:** Research topic selection in specialty field

This course is 2 workshop units and it has considered in training program. In this course resident will determine the thesis subject with the help of supervisor tutor in workshop classes. Collecting papers, related researches and searching about the subject should be done after the class time and the conclusions must be presented in class session. Primary submission of the subject in research vice-chancellor department indicates this course has been passed.

**Thesis 2- Objective:** Submitting the research proposal

This course is 2 workshop units and resident must participate in classes with guidance of statistical consultant or epidemiologist. Resident must complete the research proposal by the end of term and submit it on related website (Pajoooheshyar).

**Thesis 3- Objective:** Doing the research

This course is 2 practical units and must be considered in the training program. The time and method of presenting this course is completely up to the supervisor tutor. If the research takes more than one semester, then if the supervisor approves the work which should have been done, is considerably done in this semester, then taking this course once is sufficient.

**Thesis 4- Objective:** Thesis and paper writing

This course is 2 workshop units. Resident must pay his time to statistical analysis, providing conclusions and writing the thesis under tutor supervision. He must at least write one scientific paper out of his thesis and submit it in a approved journal.

**Thesis 5- Objective:** Thesis presentation

This course is 2 workshop units. In this course resident will complete the thesis and prepare it for presenting.

Note: It is obvious that all the thesis cannot follow the discussed process and according to the time period of research it can be postponed for another semester and with research vice-chancellor department its schedule can be fixed.

**Course title:** Interpretation of lesions (theoretical) 1 to 6      **Course No:** 37-42

**Type and units of the courses:** 24 theoretical units (4 units each semester)

**Training hours:** 408 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Study the basics of oral and maxillofacial radiologic interpretation and methods of differential diagnosis of lesions.

**Content topics:**

1. Introduction to basics of radiologic interpretation
2. Study of anatomic landmarks: Radiopaque, Radiolucent
3. Introduction to appearances of trauma to teeth and jaws.
4. Study the dental anomalies
5. Introduction to dental caries appearance
6. Introduction to periodontal lesions
7. Study the contacting teeth lesions
8. Study the not contacting teeth lesion
9. Study the radiographic appearances of systemic diseases
10. Study the developmental congenital disorders
11. Study the maxillofacial traumatic lesions
12. Study the salivary glands lesions
13. Study the temporomandibular joint disorders
14. Introduction to radiographic basics of dental implants complications

**Course title:** Interpretation of lesions (practical) 1 to 6    **Course No:** 43-48

**Type and units of the courses:** 12 practical units (2 units each semester)

**Training hours:** 408 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Practical study of oral and maxillofacial radiologic interpretation and methods of differential diagnosis of lesions.

**Content topics:**

Presentation of at least 500 case reports of patients referred to oral and maxillofacial radiology department.

**Course title:** Radiobiology and radiation protection    **Course No:** 49

**Type and units of the courses:** 2 theoretical units

**Training hours:** 34 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Study the biologic effects of ionizing radiations on human body and protection methods against them

**Content topics:**

1. Understanding the effects of radiation:

- Effects of radiation on molecules
- Lesions which are created due to radiation in cells
- Relations between wave length and biologic effects
- Radiation effects on varieties of cells
- Radiation effects on genome, chromosome and mutations
- Lesions due to radiations to tissues
- Goal- setting theory
- Radiation effects on organs and tissue sensitivity
- Early and late effects of radiation
- Carcinogenicity
- Acute radiation syndrome
- Radiation effects on embryo
- Effective factors on radiation side effects
- Radiation effects on oral tissues and jaws

2. Radiation protection:

- Rules and guidelines of institutes and international committees
- Radiation sources
- Determining factors the radiation amounts in the workplace
- Radiation protection methods in patients
- Radiation protection methods in operators
- Monitoring and control of people, tools and workplace
- Protection for patients with special needs ( Pregnant women, patients being treated with radiation)

**Course title:** Intraoral radiography    **Course No:** 50

**Type and units of the courses:** 1 theoretical unit

**Training hours:** 17 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Study of different intraoral radiography methods

**Content topics:**

1. Principles of intraoral radiography
2. Introduction to periapical radiography methods:
  - Bisecting- angle method
  - Paralleling method
3. Bite wing radiography
4. Occlusal radiography
5. Study the technical errors
6. Study the localization techniques
7. Study the advanced intraoral techniques
8. Study the modified intraoral techniques for patients with special needs (Pregnant women, kids, disabled and old people, ...)

**Course title:** Practical intraoral radiography    **Course No:** 51-53

**Type and units of the courses:** 3 practical units

**Training hours:** 102 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Applications of different intraoral radiography methods and earning sufficient skill

**Content topics:**

1. Performing at least 300 bisecting- angle intraoral radiographs
2. Performing at least 150 bite wing radiographs
3. Performing at least 600 paralleling intraoral radiographs
4. Performing 20 occlusal radiographs
5. Performing at least 20 localization radiographs if needed
6. Performing at least 300 digital intraoral radiographs
7. Performing at least 150 intraoral radiographs for kids

**Course title:** Extraoral radiography **Course No:** 54

**Type and units of the courses:** 1 theoretical unit

**Training hours:** 17 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** study of different extraoral radiography methods and their applications

**Content topics:**

1. Study the principles of extraoral techniques
2. Study the anatomic landmarks in extraoral radiographs
3. Study the different extraoral techniques:
  - Panoramic
  - Cephalometry
  - Skull radiography
  - Radiography of jaws
  - Radiography of facial bones
  - Radiography of salivary glands with different contrast medias
  - Nasopharynx radiography
  - Tempromandibular joint radiography

**Course title:** Practical extraoral radiography    **Course No:** 55-59

**Type and units of the courses:** 6 practical units (course 1-4 is 1 unit and course 5 is 2 practical units)

**Training hours:** 204 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Applications of different extraoral radiography methods and earning sufficient skill

**Content topics:**

1. Performing at least 600 panoramic radiography
2. Performing at least 200 cephalometry radiography
3. Performing at least 20 skull and face radiography
4. Performing radiography of salivary gland (sialography if possible)
5. Performing at least 100 CBCT and its related interpretations



**Course title:** Seminar in radiology department 1- 5    **Course No:** 60-64

**Type and units of the courses:** 5 workshop units (1 unit each semester)

**Training hours:** 225 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Introduction to methods of collection and integration of data and present related seminars on physical basics of imaging and protection radiobiology, interpretation and samples of dental lesions.

**Content topics:**

1. Subject selection
2. Correct data collection
3. Translation and integration of data
4. Present seminar over the chosen subject

**Course title:** Physical basics of imaging    **Course No:** 65

**Type and units of the course:** 3 theoretical units

**Training hours:**51 hours

**Prerequisite and simultaneous course:** None

**Main objectives:** Study the physical basics of radiology ,image formation and effective factors to create a radiography

**Content topics:**

1. Knowledge of radiation and radiation spectrum
  - The nature of radiation and radiation spectrum
  - Electromagnetic waves, x-ray production, x-ray effect
  - Generators, structure and their accessories
  - Transformers, rectifier and timer
  - Controlling factors of x-ray and x-ray interference with a material
  - Dosimetry and measurement unit
  - Tomography
2. Physical principles of image formation
  - Geometric and visual characteristics of image and their controlling factors
  - Photo developing and darkroom
  - Films, amplifier pages and network
  - Image receivers
  - Fluoroscopy
3. Study the physical basic of ultrasound (Sonography)
4. Study of physical basic of MRI
5. Study the physical basics of radionuclide device (nuclear medicine)
6. Study the physical basic of computer tomography
7. Study the physical basic of PET,SPECT
8. Study the principles of oral radiotherapy
9. Study the basics of digital imaging
10. Study the physical basics of cone beam CT scan
11. Study the principle basics of CT scan
12. Study the difference of physical basics of cone beam CT scan and CT scan

**Course title:** Participation in students training 1-4 **Course No:** 66-69

**Type and units of the course:** 8 practical units (2 practical units each semester)

**Training hours:** 272 hours

**Prerequisite and simultaneous course:** None

**Main objective:** Practical skill earn in the teaching-learning process

**Content topics:**

Resident participation in practical and theoretical trainings (preclinical and clinical) and other trainings.

Resident participation in training attending in Dentistry DDs is under the professor supervision and the evaluation and feedback will be presented by the supervisor. Completing this course, the residents are expected to be fully dominant of modern training evaluations and can perform without errors.

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**Education (Undergraduate and Postgraduate)**

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**Deputy for Education**  
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