

## In the Name of God

### Section I:

Title: Restorative Dentistry

Degree: Master of Science in Clinical Dentistry (M.Sc.)

### Introduction

Restorative dentistry is a clinical specialty in dentistry consisting of prevention, diagnosis of caries, restoration and performing esthetic procedures on teeth. Successful completion of academic courses leads to professional certification.

### 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 complication due to caries given to their prevalence, gradation of the quality of life and reduction of health care costs nationwide
- Correct treatment of dental caries and its importance in providing, maintaining and promoting public health
- The necessity of being informed of the latest scientific and technical achievements
- The necessity of conducting research and extending borders of science

### The Aim of the Course

The aim of the course is to train specialists in Restorative Dentistry that in terms of knowledge, practical skills and the belief are within national and international standards, are able to provide high quality therapeutic and preventive services and move in the direction of extending borders of science and research in this field.

### 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, companions and colleagues, and management and executive participation in the health team.

### Specific Competencies and Skills

#### Diagnosis of dental defects

- Skills for treatment planning and use of various methods of diagnosis, restoration of teeth
- Communication, coordination and services providence in conjunction with other related disciplines
- The ability to use information in new research
- The ability to conduct research in the field of Restorative Dentistry
- The ability to teach and appraise scientific resources

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

- a) In the area of altruism: preferring the patient's interests to their own, observance of justice while working with different patients, considering all physical, psychological, social and belief-related aspects of patients while treating them, spending enough time in all phases of patient care, paying attention to patients' demands and discomforts, observance of the patients' bill of rights.
- b) In the area of dutifulness and responsibility: have enough commitment to do their tasks, answer patients' questions, provide patients and their accompaniers with information regarding the patient's status in the most appropriate way, avoid unnecessary interferences with colleagues' work and interact with the health team members, ask patients' permission for examining and taking any diagnostic-therapeutic measures, and instructing patients properly regarding prevention, appearance of side effects, disease reoccurrence and improvement of life quality.
- c) In the area of honor and honesty: be truthful, honest and confidant and respect patient's privacy.
- d) In the area of respecting others: respect patients' conventions, traditions and habits, respect patient as a human being, respect patients' time and observe order and regularity, respect patients' accompaniers, colleagues and therapeutic team members, and have an appearance appropriate to professional prestige.
- e) In the area of professional career: accept critique, know their scientific limitations, ask for advice and help if needed, improve their knowledge and skills constantly, do diagnostic-therapeutic measures according to available facilities and scientific achievements, and observe the standards of completing medical record and reporting.

#### The Terms and Conditions of Admission to the Course

Applicant's documents, including his/her DDS/BDS degree, CV, Recommendation, etc will be reviewed by the faculty members of Restorative Dentistry 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 Restorative Dentistry Department. If he/she could successfully pass the interview/evaluation period, he/she will be accepted to continue as a MSc student.

#### Educational Strategies, Methods and Techniques

The following educational strategies are considered in Restorative Dentistry:

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

The educational system of the Restorative Dentistry MSs program is semestrial. Theoretical, practical and workshop courses are set in three areas of basic sciences, related sciences and specialty sciences.

#### Student Assessment

A variety of assessment methods including theoretical exam, DOPS, OSCE, Seminar presentation, portfolio, etc, depending on the course, is implemented.

#### Number and Type of Credits and Tables of the Courses

The Restorative Dentistry MSc program is a 3 year full time program in accordance with the regulations of the Council of Dental and Specialty Educations.

## Course structure

The course structure of the Restorative Dentistry MSc program consisting of common and specialized basic science, related science and specialty science courses is as follows:

### Basic science courses

These 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 MSc program.

Overall basic science courses consist of 13.5 units. 5 of them are optional and residents must select at least 2 units.

### 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.

These courses consist of 14 units in a joint program with different educational departments.

### Specialty science courses

Specialty science courses are aimed to enhance and deepen the level of knowledge, create belief and high quality skills in the field of the specialty of Restorative Dentistry and consists of 74 units in this field. These courses will be delivered and led by faculty members.

The total number of units in MSc program of Restorative Dentistry is 98.5 units.

A: Common Basic Sciences Schedule

Code	Course	Units				Hours				prerequisite
		Theoretical	Practical	Workshop	total	Theoretical	Practical	Workshop	total	
1	Medical Education(1)	-	-	1	1	-	-	51	51	-
2	Medical Education(2)	-	-	2	2	-	-	102	102	-
3	Dental equipment ++	-	-	1	1	-	-	51	51	-
4	Research methodology & EBD	-	-	2	2	-	-	102	102	-
5	Pharmacology	1	-	-	1	17			17	-
6	Clinical photography	-	-	1	1	-	-	51	51	-
7	Medical emergencies	-	-	0.5	0.5	-	-	24	24	-
8	Medical Regulation and Ethics++	-	-	1	1	-	-	51	51	-
9	Infection Control & Patient's Safety	-	-	1	1	-	-	51	51	-
10	Clinical Management and Governance	-	-	1	1	-	-	51	51	-
11	Tissue engineering	2	-	-	2	34	-	-	34	-
total		3	-	10.5	13.5	51	-	534	585	-

++These units are optional and at least 2 units must be select.

Related Sciences

Code	Course	Units				Hours				prerequisite
		Theoretical	Practical	Workshop	total	Theoretical	Practical	Workshop	total	
12	Orthodontics	1	-	-	1	17	-	-	17	-
13	Theoretical dental implants	1	-	-	1	17	-	-	17	16
14	Practical dental implants	-	1	-	1	-	34	-	34	16
15	Occlusion(1)	2	-	-	2	34	-	-	34	57
16	Occlusion(2)	1	-	-	1	17	-	-	17	15
17	Theoretical endodontics	1	-	-	1	17	-	-	17	-
18	Practical endodontics	-	1	-	1	-	34	-	34	-
19	Theoretical fixed prosthodontics	1	-	-	1	17	-	-	17	-
20	Practical fixed prosthodontics	-	1	-	1	-	34	-	34	-
21	Theoretical periodontics	1	-	-	1	17	-	-	17	-
22	Practical periodontics	-	1	-	1	-	34	-	34	-
23	Theoretical oral and maxillofacial radiology	1	-	-	1	17	-	-	17	-
24	Practical oral and maxillofacial radiology	-	1	-	1	-	34	-	34	-
total		9	5	-	14	153	170	-	323	

Specialty sciences

Code	Course	Units				Hours				prerequisite
		Theoretical	Practical	Workshop	total	Theoretical	Practical	Workshop	total	
25	Case presentation 1	2	-	-	2	34	-	-	34	
26	Case presentation 2	2	-	-	2	34	-	-	34	25
27	Evidence based case presentation	1	-	-	1	17	-	-	17	32
28	CAD/CAM	1	-	-	1	17	-	-	17	-
29	Laser in restorative dentistry	1	-	-	1	17	-	-	17	-
30	Journal Club1	1	-	-	1	17	-	-	17	42
31	Journal Club2	2	-	-	2	34	-	-	34	30
32	Journal Club3	3	-	-	3	51	-	-	51	31
33	Journal Club4	3	-	-	3	51	-	-	51	32
34	Thesis 1	-	-	2	2	-	-	102	102	-
35	Thesis2	-	-	2	2	-	-	102	102	34
36	Thesis3	-	2	-	2	-	68	-	68	35
37	Thesis4	-	-	2	2	-	-	102	102	36
38	Thesis5	-	-	2	2	-	-	102	102	37
39	Restorative dentistry preclinic (1)	-	3	-	3	-	102	-	102	-
40	Restorative dentistry preclinic (2)	-	2	-	2	-	68	-	68	39
41	Diagnosis and treatment planning in restorative dentistry	2	-	-	2	34	-	-	34	-
42	Theoretical Restorative	2	-	-	2	34	-	-	34	-

	dentistry (1)									
43	Theoretical Restorative dentistry (2)	2	-	-	2	34	-	-	34	42
44	Theoretical Restorative dentistry (3)	2	-	-	2	34	-	-	34	43
45	Practical Restorative dentistry (1)	-	2	-	2	-	68	-	68	39
46	Practical Restorative dentistry (2)	-	4	-	4	-	136	-	136	45
47	Practical Restorative dentistry (3)	-	4	-	4	-	136	-	136	46
48	Practical Restorative dentistry (4)	-	4	-	4	-	136	-	136	47
49	Practical Restorative dentistry (5)	-	3	-	3	-	102	-	102	48
50	Esthetics in dentistry (1)	2	-	-	2	34	-	-	34	-
51	Esthetics in dentistry (2)	2	-	-	2	34	-	-	34	50
52	Esthetics in dentistry (3)	2	-	-	2	34	-	-	34	51
53	Carries and microbes associated with it (1)	3	-	-	3	51	-	-	51	-
54	Carries and its article review(2)	2	-	-	2	34	-	-	34	53
55	Direct gold (adhesive)	1	-	-	1	17	-	-	17	-
56	Dental morphology	-	1	-	1	-	34	-	34	-
57	Basic dental materials (1)	1	-	-	1	17	-	-	17	-
58	Dental materials (2)	2	-	-	2	34	-	-	34	57

59	Dental materials (3)	2	-	-	2	34	-	-	34	58
Total		41	25	8	74	697	850	408	1955	



## Ethical issues

The graduates should,

- Observe the Patient's Bill of Rights<sup>1</sup> when working with the patients.
- Strictly observe Biosafety and Patient Safety Rules\* concerning the patients, personnel and workplace.
- Observe the Rulebook for Dress Code<sup>2</sup>.
- Strictly observe the Regulations of Working with the Laboratory Animals<sup>3</sup>.
- Carefully preserve resources and equipment.
- Truly respect faculty members, the staff, classmates and other students and work for creating 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: Medical Education (1)

Unit code: 1

Number and type of unit: 1 workshop unit

Educational hours within the course duration: 51h

Prerequisite: none

Aims:

The aim of the Medical Education (1) and (2) units is for the residents to obtain the necessary ability to take part in the education and evaluation of theoretical, workshop, preclinical and clinical courses in their specialty field.

Subtitles

1. The role of the faculty members in the field of education
2. Principles of teaching-learning
3. Types of learning
4. Skills regarding the process of teaching
5. Characteristics and duties of faculty
6. Lesson plan
7. Educational aims
8. Principles of preparing educational contents
9. Speech
10. The text of questions and answers
11. Small group education
12. Different methods of group training
13. Roll fulfillment and simulation
14. Clinical education
15. Educational aids
16. Smart boards
17. PowerPoint preparation

Unit title: Medical Education (2)

Unit code: 2

Number and type of unit: 2 workshop units

Educational hours within the course duration: 102h

Prerequisite: none

Aims:

The aim of the Medical Education (1) and (2) units is for the residents to obtain the necessary ability to take part in the education and evaluation of theoretical, workshop, preclinical and clinical courses in their specialty field.

Subtitles

1. Specific lesson plans
2. Student evaluation and its methods
3. Multiple-choice questions
4. Descriptive questions
5. Level classification of exam questions
6. Evaluation
7. Dops design
8. OSCE exams
9. Oral exam
10. Question analysis
11. Plan evaluation
12. Course planning
13. Log book
14. Port folio
15. Perspectives based on learning ability
16. Standard patent
17. Integration in education

Unit title: Dental equipment \*

Unit code: 3

Number and type of unit: 1 workshop unit

Educational hours within the course duration: 51h

Prerequisite: none

Aims:

Familiarity with dental equipment and their performance, common problems and how to troubleshoot them. Acquaintance with common musculoskeletal problems and their prevention.

Subtitles

	Content	Method of learning-teaching	Duration (sessions)
1	Dental units, compressors and their components	Workshop	1
2	Suctions and their components	Workshop	1
3	Dental chairs	Workshop	1
4	High speed hand pieces	Workshop	1
5	Air motors and micro motors	Workshop	1
6	Contra angles and hand pieces	Workshop	1
7	Apex finder, pulp tester, scaling devices and airflow	Workshop	1
8	Light cure device	Workshop	3
9	Intraoral and RVG radiographs, processing devices	Workshop	3
10	amalgamator	Workshop	1
11	Heat oven, autoclave, instrument irrigation devices, UV lights	Workshop	1
12	Bleaching devices	Workshop	1
13	Professional diseases in dentistry	Workshop	1
14	Exercise, appropriate movements for preventing musculoskeletal problems	Videos, discussion, role playing	1
15	Treatment of professional diseases in dentistry	Workshop	1
16	Proper setting of the office and equipment	Lecture	1
17	Dental office soft wares	Lecture	1

Faculty members can change the titles, method of teaching and duration based on necessity

\*This is an optional course

Unit title: Research methodology and EBD

Unit code: 4

Number and type of unit: 2 workshop units

Educational hours within the course duration: 102h

Prerequisite: none

Aims:

Acquisition of knowledge and familiarity with the methods of research in the field of education and skill acquirement in order to publish the results of research.

Subtitles

	Content	Method of learning-teaching	Duration (hours)
1	Principles of research and evidence-based dentistry and designing questions in evidence-based dentistry	Problem oriented lecture	3
2	A review of the scientific resources	Problem oriented lecture	3
3	Search engines and important and practical sites in dentistry	Workshop	6
4	Familiarity with resource management soft wares for all types of studies in dentistry	Practical	9
5	Types of studies in dentistry	Interactive lectures	3
6	Descriptive studies	Lecture, discussion in small groups	3
7	Indicators of health and disease measurement	Problem oriented lecture	3
8	Indicators of measuring correlation	Problem oriented lecture	3
9	Principles of analytical-observational studies	Lecture	3
10	Interventional studies	Problem oriented lecture	3
11	Review studies	Lecture	3
12	Evaluation of diagnostic tests	Problem oriented lecture	3
13	Errors and causation	Problem oriented lecture	3
14	Principles of descriptive statistics	Problem oriented lecture	6
15	Estimation and hypothesis testing	Problem oriented lecture	6
16	Critical evaluation	Lecture	3
17	Prioritization and topic selection and proposal	Lecture, discussion in small groups	3

18	Objectives, hypothesis and variables and research management and ethics	Lecture, discussion in small groups	3
19	Methods of data collection and questionnaires	Lecture, discussion in small groups	3
20	Sampling and sample size calculation	Lecture, discussion in small groups	3
21	Research Errors - Bias	Problem oriented lecture	3
22	Interactions and research errors - confounding	Problem oriented lecture	3
23	Special considerations in cohort studies and case-control studies	Lecture, discussion in small groups	3
24	Special considerations in interventional studies	Lecture, discussion in small groups	3
25	Special considerations in evaluating diagnostic tests	Lecture, discussion in small groups	3
26	Qualitative studies	Problem oriented lecture	3
27	Familiarity with statistical tests used in dentistry	Problem oriented lecture	6

Unit title: Pharmacology

Unit code: 5

Number and type of unit: 1 theoretical unit

Educational hours within the course duration: 17h

Prerequisite: none

Providing department: Pharmacology

Aims:

Familiarity with practical and common drugs in dentistry, their effects and interactions

#### Subtitles

1. General overview
  - Mechanisms of absorption, excretion and effects of drugs on the body
  - Side effects of drugs (toxic effects, idiosyncrasies, hypersensitivity...)
  - Drug interactions
  - Drug prescription during pregnancy and lactation
2. Principles of drug prescription
3. Analgesics and their pharmacology
4. Pharmacology of steroid and non-steroid anti-inflammatory drugs
5. Antibiotic classification and mechanism of action (antimicrobial, antifungal and antiviral)
6. Antihistamine
7. Local anesthetics
8. Drugs affecting the central and automatic nervous system
9. General anesthetics
10. Drugs affecting saliva
11. Drugs locally administered on skin and mucosa
12. Local effect of drugs in dentistry
13. Immunosuppressants for treatment of non-neoplastic diseases
14. Role of vitamins and minerals in oral diseases

Educational method: seminars, small group discussion

Evaluation method: M.C.Q, written exam

Unit title: Clinical photography

Unit code: 6

Number and type of unit: 1 workshop unit

Educational hours within the course duration: 51h

Prerequisite: none

Aims:

Familiarity with types of cameras and taking specialized photographs from dental patients and storing them.

Minimum skills expected:

The resident must be continuously proficient regarding the steps needed in emergencies and must apply them on standardized patient. For this purpose, a flowchart of emergency treatments must be displayed by residents.

Subtitles

	Content	Method of learning-teaching	Duration (session)
1	Familiarity with types of standard and proper cameras and learning how to use cameras and a fulcrum	Workshop	1
2	Familiarity with a types of retractors, mirrors and how to use them	Workshop	1
3	Portrait and profile photography	Workshop	1
4	Intra-oral and extra-oral photography	Workshop	1
5	Taking photographs from radiographs and casts	Workshop	1
6	Familiarity with 3 dimensional pictures and how to prepare them	Workshop	1
7	Familiarity with the resolution of possible problems established during the workshop and group photography	Workshop	1
8	Executing standard photographs and their analysis	Workshop	3
9	Taking 3 dimensional graphs and analyzing them	Workshop	3
10	Superimposing photographs and radiographs	Workshop	1
11	Familiarity with storage of images (two-dimensional and three-dimensional)	Workshop	1
12	Familiarity with soft wares related to photography and editing pictures	Workshop	1
13	Power point slide presentation	Workshop	1

Main reference:

Mastering Digital Dental Photography, 2006 Ed.



Unit title: Medical emergencies

Unit code: 7

Number and type of unit: 0.5 workshop unit

Educational hours within the course duration: 24h

Prerequisite: none

Aims:

Skill acquisition in the diagnosis and treatment of common medical emergencies in dental clinics in Skill Labs and learning on training models

Subtitles

1. How to obtain medical history and its role in the prevention and diagnosis of emergencies and examinations
  2. Equipment and facilities in emergencies
  3. Common emergencies and their management, including hypersensitivity reactions, respiratory problems and changes in the level of consciousness
  4. CPR
  5. Circulation – Airway- Breathing techniques
  6. Application of drugs in medical emergencies
  7. Practical skills in medical emergencies (injection, serum therapy ...)
  8. Familiarity with emergency materials and facilities in the department and shared facilities in the school
- It is recommended that sessions be held as 3h workshop sessions and this course be taught by Oral and Maxillofacial Surgeons (which can be organized in collaboration with the Department of Emergency Medicine)

Unit title: Medical Regulation and Ethics\*

Unit code: 8

Number and type of unit: 1 workshop unit

Educational hours within the course duration: 51h

Prerequisite: none

Aims:

Empowering residents in morality theories, their professional obligations towards the society and the legal rights of patients and colleagues. During this course the recognition skills of residents regarding ethical issues and their analysis is strengthened so that they can make the best decisions considering ethical and legal regulations in educational and research environments as faculty members and researchers and during service delivery as a therapist.

Subtitles

	Content	Method of learning-teaching	Duration (session)
1	General and practical ethics and professionalism	Workshop	1
2	Altruism, respect, job sublimity and justice	Workshop	1
3	Honor and honesty, conscientiousness	Workshop	1
4	History and moral philosophy, and the four principles of bioethics	Workshop	1
5	Ideologies and moral theories	Workshop	1
6	Diagnostic tools in ethical decision making	Workshop	1
7	Informed consent, acquittal and determination of substitute decision-making capacity	Workshop	1
8	Confidentiality and speaking the truth	Workshop	1
9	The relationship of dentist with other members of the health	Workshop	1
10	Principles of office management, medical documentation, communication of dentists with patients	Workshop	1
11	Familiarity with the medical council,	Workshop	1

	dental regulations, responsibility, medical malpractice and errors, atonement		
12	Understanding the implications of certification, and the rules of court proceedings	Workshop	1
13	Conflict of interest	Workshop	1
14	Ethics in educational environments	Workshop	1
15	Islamic jurisprudence traditions and its relation to ethics in dentistry	Workshop	1
16	Challenges in medical ethics	Workshop	1
17	Integrated case presentation	Case presentation and literature review	1

\*each session is equivalent to 3 educational hours.

References:

1. Clinical ethics: an overview of the application of ethics in treatment, compilation of William Dender
2. Professional ethics in health and therapeutic services, Mohamad Mahdi Esfehni, Office of research of Iran University of Medical Sciences,1372
3. Ethics in medical research, compilation of Treror Smith
4. Ethics for physicians, Dr Seyyed Ziaeddin Tabei, Isfehan University of Medical Sciences, 1380

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\*This is an optional course

Unit title: Infection Control & Patient's Safety\*

Unit code: 9

Number and type of unit: 1 workshop unit

Educational hours within the course duration: 51h

Prerequisite: none

Aims:

For residents to understand and perform methods and skills of patient safety in dental clinics and hospitals.

Subtitles

1. Patient safety
2. The importance of human factors in patient safety.
3. Understanding complex and effective systems in patient care and safety
4. Establishment and use of effective teams
5. Lessons from past mistakes to avoid future risks
6. Recognition and management of health risks
7. Ways to improve quality in order to improve safety
8. Increasing communications between patients, staff, and supervisors
9. Care, prevention and infection control
10. Immunity and safety in infectious diseases
11. Increase and improvement of drug safety
12. Microbiology of common infectious diseases in dentistry and their transmission
13. \* Participation in educational departments and implementing given trainings

In teamwork each resident discusses related issues.

\*This section is evaluated by faculty members in 5 integrated sessions during the resident's clinical interventions in the department while implementing given trainings. Additional clinical training is also presented. It is expected that the trained issues become institutionalized in residents and in future semesters faculty members monitor it and affect it in their evaluation.

Reference:

Patient Safety Curriculum Guide, Multi-professional Edition, World Health Organization Publications, available in the following website:

[http://whqlibdoc.who.int/publications/2011/9789241501958\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241501958_eng.pdf)

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\*This is an optional course

Unit title: Clinical Management and Governance

Unit code: 10

Number and type of unit: 1 workshop unit

Educational hours within the course duration: 51h

Prerequisite: none

Aims:

Understanding the models and tools of management of service quality, needs of service excellence, patient safety, management and evaluation exert, believing the need to improve the quality of oral health services through the establishment of models and tools for quality management including models of clinical service governance.

Minimum practical skills expected:

It is expected that in the end of this course residents demonstrate management of clinical services while providing oral health care and in higher semesters demonstrate it automatically.

Subtitles

	Content	Method of learning-teaching	Duration (hours)
1	Quality and methods for its improvement	Workshop	1
2	Management of the quality of oral health care	Workshop	1
3	Governance of clinical services and its prerequisites	Workshop	1
4	Models and tools of quality management	Workshop	1
5	Patient safety	Workshop	1
6	Clinical efficacy	Workshop	1
7	Concepts of clinical efficacy and evidence based dentistry and clinical audit	Workshop	1
8	Interaction with patients, concomitant and community	Workshop	1
9	Education, training and managing staff	Workshop	1
*10	Improvement of the quality of services of the specialty	Workshop	5
*11	Evaluating the substantiation and performance of clinical governance concepts in the specialty	Workshop	3

\*These items are during the service provision in the specialty field but in these sessions required trainings regarding clinical service governance are provided by faculty members.

Management of this course is up to the vice dean of post-graduate educations. Evaluation of this program is done by assessing it from the perspective of students and faculty and the rate of achievement of the specific aims, with should be performed by the head of the department and the results and suggestions and strategies regarding the improvement of the implementation of the program should be provided to the board of post-graduate educations.

Unit title: Tissue engineering

Unit code: 11

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Providing department: Department of tissue engineering

Aims:

Familiarity with basics in tissue engineering

Subtitles

1. Familiarity with materials used in tissue engineering

Definition and classification of biomaterials, history and advances in biomaterials, clinical applications of biomaterials, properties of polymers, analysis and selection of polymers with different applications, applications of polymers in tissue engineering, applications of biomaterials in medicine and dental implants.

2. Basics of tissue engineering

Behavior of cells during tissue repair, development of active tissues in vitro, development of active tissues in the body, tissue engineering models, general concepts in cell transplant and synthesized tissue products.

3. Cellular and molecular biology

Cell structure, the structure of DNA and chromosomes, the structure of RNA, replication, cell division, genetic codes, transcription, protein synthesis, cell apoptosis, mutation and DNA repair.

4. Cell culture

Methods of cell culturing, culture dishes, culture media, buffering of culture media, serum and serum-free environments, methods of expression and evaluation of cell lines, cell behavior in culture medias.

5. Biologic scaffolds

Bioceramics, bioactive glass and glass, ceramics, natural and synthetic polymers, hydrogels, metals- films- bioactive covers, biodegrading composites, methods of scaffold synthesis, surface properties of scaffolds, surface basics for scaffolds to bond with hard and soft tissues, biocompatibility and its evaluation, methods for sterilization and its clinical applications.

Educational method: seminars

Evaluation method: MCQ, written exam

Unit title: Orthodontics

Unit code: 12

Number and type of unit: 1 theoretical unit

Educational hours within the course duration: 17 h

Providing department: Department of Orthodontics

Aims:

Familiarity with orthodontic perspectives regarding restorative dentistry

Subtitles

1. Additional orthodontic and restorative treatments
  - Methods for up righting molars
  - Forced eruption
  - Tooth space management
  - Malformations
  - Missing
2. Smile design in orthodontics
  - Definition of a normal smile
  - Recognition of a normal smile from an abnormal one
  - Effective implements in an abnormal smile
  - Orthodontic methods for treatment of abnormalities

Educational method: seminars, small group discussions

Evaluation method: MCQ, written exam



Unit title: theoretical dental implants

Unit code: 13

Number and type of unit: 1 theoretical unit

Educational hours within the course duration: 17 h

Prerequisites: occlusion (2)

Providing department: Department of implants

Aims:

Familiarity with dental implants

#### Subtitles

1. Introduction to dental implants
2. Logic for the use of dental implants
3. Periodontal indexes in dental implants
4. Terminology in dental implants
5. Components and types of dental implants
6. Importance of the existing bone in implants
7. Single implant based prosthesis
8. Effect of occlusal stresses and forced on the treatment plan
9. Evaluation of the quality and condition of the implant

Educational method: seminars, small group discussions

Evaluation method: MCQ, written exam

Unit title: practical dental implants

Unit code: 14

Number and type of unit: 1 practical unit

Educational hours within the course duration: 34 h

Prerequisites: occlusion (2)

Providing department: Department of implants

Aims:

Familiarity with dental implants

#### Subtitles

1. Selection and evaluation of radiographs for single prosthesis treatment (3 cases)
2. Selecting the implant type
3. Impression
4. Checking
5. Prosthesis delivery to patient

Educational method: practical education on patients

Evaluation method: constant presence in the department, performing correct treatment, 360 degree evaluation

Unit title: occlusion (1)

Unit code: 15

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: dental morphology

Providing department: Department of restorative dentistry and prosthodontics

Aims:

Familiarity with alveolo-dental relations and the effect of occlusion regulations

Subtitles

1. The anatomy of TMJ and muscles that elevate and descend the jaw
2. Physiologic movements of the jaw in relation with TMJ
3. Physiologic movements of the jaw and evaluating them in different planes
4. Occlusal plane
5. V.D
6. C.R
7. Anterior guidance
8. Types of eccentric occlusion
9. Occlusion regulations and the relation between jaw movements and the surface morphology of teeth

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: occlusion (2)

Unit code: 16

Number and type of unit: 1 theoretical units

Educational hours within the course duration: 17 h

Prerequisites: occlusion (1)

Providing department: Department of prosthodontics

Aims:

Familiarity with articulators and jaw records and occlusal adjusting

Subtitles

1. Types of articulators
2. Recording
3. Cast transfer to the articulator and face bow
4. Functional wax up
5. Types of posterior teeth relations
6. Occlusal adjustment

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: theoretical endodontics

Unit code: 17

Number and type of unit: 1 theoretical units

Educational hours within the course duration: 17 h

Prerequisites: -

Providing department: Department of endodontics

Aims:

Familiarity with endodontic perspectives regarding root canal therapy and restorative dentistry

#### Subtitles

1. Endodontic considerations in the restoration of root canal treated teeth
2. Endodontic emergencies
3. Success and failure of restorative treatments
4. Diagnosis of teeth requiring endodontic treatments
5. Pulp capping according to endodontic perspectives
6. External and internal resorptions and the etiology
7. Etiology of perforations

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: practical endodontics

Unit code: 18

Number and type of unit: 1 practical unit

Educational hours within the course duration: 34 h

Prerequisites: -

Providing department: Department of endodontics

Aims:

Familiarity with endodontic perspectives regarding root canal therapy and restorative dentistry

Subtitles:

1. Uncomplicated root canal retreatment
2. Root canal therapy of single and multi-rooted teeth
3. Vital pulp therapy

Educational method: practical education on patients

Evaluation method: constant presence in the department, performing correct treatment, 360 degree evaluation

Unit title: theoretical fixed prosthodontics

Unit code: 19

Number and type of unit: 1 theoretical unit

Educational hours within the course duration: 17 h

Prerequisites: -

Providing department: Department of prosthodontics

Aims:

Familiarity with prosthodontics perspectives regarding fixed prosthodontics

Subtitles:

1. Diagnosis and treatment planning in fixed prosthodontics
2. Diagnosis and treatment planning in implant
3. Tooth preparation
4. Types of tooth preparation
5. Methods for gingival retraction
6. Provisional restoration
7. Pontic designing and its type and types of edentulous ridges
8. Post fabrication and its types
9. Root perforation
10. Crown contour
11. Splint and its applications
12. Adjusting occlusion
13. Forced eruption
14. Diastema closure and its principles

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: practical fixed prosthodontics

Unit code: 20

Number and type of unit: 1 practical unit

Educational hours within the course duration: 34 h

Prerequisites: -

Providing department: Department of prosthodontics

Aims:

Practical familiarity with prosthodontics perspectives regarding fixed prosthodontics

Subtitles:

1. Tooth preparation and all laboratory stages in the fabrication of crowns
2. Fabrication of casting posts
3. Fabrication of crowns
4. Fabrication of bridges

Educational method: practical education on patients

Evaluation method: constant presence in the department, performing correct treatment, 360 degree evaluation



Unit title: theoretical periodontics

Unit code: 21

Number and type of unit: 1 theoretical unit

Educational hours within the course duration: 17 h

Prerequisites: -

Providing department: Department of periodontics

Aims:

Familiarity with periodontics perspectives regarding restorative dentistry

Subtitles:

1. Classification of periodontal diseases
2. Pathology of periodontal diseases
3. Radiographic interpretation
4. Risk factors in periodontology
5. Prognosis
6. Treatment planning
7. Periodontal flaps
8. Crown lengthening surgery
9. Regenerative surgery
10. Dental implants
11. Importance of the soft tissues surrounding dental implants

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: practical periodontics

Unit code: 22

Number and type of unit: 1 practical unit

Educational hours within the course duration: 34 h

Prerequisites: -

Providing department: Department of periodontics

Aims:

Familiarity with periodontal treatments regarding common treatments

Subtitles:

1. Soft tissue management
2. Electro surgery

Educational method: practical education on patients

Evaluation method: constant presence in the department, aiding or performing correct treatment, 360 degree evaluation

Unit title: theoretical oral and maxillofacial radiology

Unit code: 23

Number and type of unit: 1 theoretical unit

Educational hours within the course duration: 17 h

Prerequisites: -

Providing department: Department of radiology

Aims:

Familiarity with modern intra and extra-oral radiographic techniques and differential diagnosis of oral and dental lesion by using radiographs

Subtitles:

1. Radiobiology and protection
2. Principles of diagnosis and radiographic interpretation
3. Radiologic considerations and dark room in dental offices and protection
4. Modern techniques in radiology
  - CBCT
  - CT
  - MRI
  - Digital imaging
  - Sonography
  - Nuclear medicine
5. Radiology for dental implants
6. Radiologic principles in traumatic patients
7. TMJ radiology

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: practical oral and maxillofacial radiology

Unit code: 24

Number and type of unit: 1 practical unit

Educational hours within the course duration: 34 h

Prerequisites: -

Providing department: Department of radiology

Aims:

Familiarity with practical intra-oral radiographic techniques and differential diagnosis of oral and dental lesion by using radiographs

Subtitles

1. Interpretation of carries
2. Intra-oral digital radiography
3. Practical education of intra-oral digital radiography

Educational method: practical education on patients

Evaluation method: correct radiographic imaging, 360 degree evaluation

Unit title: case presentation (1)                      Unit code: 25

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: -

Aims:

Acquiring skills for appraisal about diagnosis, treatment planning, treatments and prognosis and defending treatments done for each case

Subtitles

1. Presentation and discussion about treatments and complicated patients
2. Critical appraisal of treatments and procedures done, pre and post-operative radiographs, success and failure of treatments and their etiology (minimum of 3 cases)

Education method: case report

Evaluation method: performing correct treatment under the supervision of faculty

Unit title: case presentation (2)                      Unit code: 26

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: case presentation (1)

Aims:

Acquiring skills for appraisal about diagnosis, treatment planning, treatments and prognosis and defending treatments done for each case

Subtitles

1. Presentation and discussion about performed treatments in the presence of faculty members and residents (minimum of 3 cases)

Education method: case report

Evaluation method: performing correct treatment under the supervision of faculty

Unit title: evidence based case presentation

Unit code: 27

Number and type of unit: 1 theoretical units

Educational hours within the course duration: 17 h

Prerequisites: journal club (3)

Aims

Collection and critical appraisal of articles in restorative dentistry with similar content

Subtitles

Evidence based evaluation of articles in restorative dentistry

Educational methods: seminars, small group discussions

Evaluation methods: appraisal and correct understanding of presented articles and constant presence

Unit title: CAD/CAM

Unit code: 28

Number and type of unit: 1 theoretical units

Educational hours within the course duration: 17 h

Prerequisites: -

Aims

Familiarity with CAD/CAM

Subtitles

1. CAD/CAM system
2. Tooth preparation
3. Impression
4. Fabrication of provisional restorations
5. Methods of prosthesis fabrication ( inlay, onlay, veneer, full ceramic crowns) with machines
6. Checking and adjusting occlusion
7. Cementation
8. Polishing and finishing
9. Problems and fixing them

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam, questions and answers



Unit title: laser in restorative dentistry

Unit code: 29

Number and type of unit: 1 theoretical units

Educational hours within the course duration: 17 h

Prerequisites: -

Providing department: department of laser and restorative dentistry

Aims

Familiarity with the physics of light and the properties of laser, principles of laser devices, types of lasers in restorative dentistry, diagnosis of carries, cavity preparation, curing of materials, bleaching,...

Subtitles

1. Laser and physics of laser
2. Principles of laser devices
3. Types of lasers in dentistry
4. Important parameters in laser
5. Tissue reaction to laser
6. Principles of safety
7. Diagnosis of carries with laser (diagnodent)
8. Cavity preparation in teeth (Er:YAG, Er,Cr:YSGG)
9. Curing of materials- bleaching and anti-hypersensitivity by laser

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam, questions and answers

Unit title: journal club (1)

Unit code: 30

Number and type of unit: 1 theoretical units

Educational hours within the course duration: 17 h

Prerequisites: theoretical restorative dentistry (1)

Aims

Critical appraisal of valid domestic and foreign articles to acquire new information and research methodology of evaluating biological effects of restorative materials

Subtitles

1. Scientific writing
2. Evaluation and presentation of articles in English and Persian languages
3. Article appraisal and drawing appropriate conclusions from the appraised articles
4. Evaluation of articles regarding biological effects of restorative materials

Educational method: critical appraisal of articles

Evaluation method: correct critical appraisal of articles, constant presence

Unit title: journal club (2)

Unit code: 31

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: journal club (1)

Aims

Critical appraisal of valid domestic and foreign articles regarding amalgam bonding and composites

Subtitles

1. Appraisal of articles regarding amalgam
2. Appraisal of articles regarding bondings
3. Appraisal of articles regarding composites

Educational method: small group discussion

Evaluation method: correct critical appraisal of articles, constant presence

Unit title: journal club (3)

Unit code: 32

Number and type of unit: 3 theoretical units

Educational hours within the course duration: 51 h

Prerequisites: journal club (2)

Aims

Critical appraisal of valid domestic and foreign articles to acquire new information and research methodology regarding different treatment plans especially about esthetic treatments- dental materials and casting posts

Subtitles

1. Presentation of articles in English and Persian languages
2. Article appraisal and drawing appropriate conclusions from the appraised articles
3. Classification of scientific research and articles
  - Original article, case reports and case series
  - Clinical trials, meta analysis and review articles

Educational method: small group discussion

Evaluation method: correct critical appraisal of articles, constant presence

Unit title: journal club (4)

Unit code: 33

Number and type of unit: 3 theoretical units

Educational hours within the course duration: 51 h

Prerequisites: journal club (3)

Aims

Critical appraisal of valid domestic and foreign articles

Subtitles

Presentation and appraisal of domestic and foreign articles in English and Persian languages regarding restorative dentistry and dental materials

Educational method: small group discussion

Evaluation method: correct critical appraisal of articles, constant presence

Unit title: Thesis (1) to (5)

Unit code: 34-38

Number and type of unit: ten practical-workshop units

Educational hours within the course duration: 476 h

Thesis (1) - Aim: Selection of research subject with in the area of specialty.

This course is held in two work shop units and must be taken to account in the educational program. The research subject will be chosen with the assistance of the relevant supervisor throughout the work shop sessions. Field research must be done out of work shop time and the outcome of it must be presented during the work shop sessions. The resident must have gathered his/her documents to present the proposal by the end of the semester. The proposal must be preregistered in the research council and the evidence suggesting that the resident has passed the course by the dead line must be handed to postgraduate director.

Thesis (2)- Aim: Registration of research subject.

This course is held in two work shop units and the resident must participate in sessions held in collaboration with statistical consultant and/or statistic experts or epidemiologists. The resident must complete his/her proposal by the end of the semester and must register it in the relevant site. Meetings must also be held with the supervising professor during these sessions.

Thesis (3)- Aim: Performing the research.

This course is held in two practical and must be taken to account in the educational program. The time and manner of performance of this unit is up to the supervisor and can be organized in continuous or interrupted sessions. The supervisor must inform the postgraduate director of the department about the progress so that other educational programs can be coordinated. If the research requires more time than one semester, the measures that must be taken during that semester should be confirmed by the supervisor.

Thesis (4)- Aim : writing the thesis and relevant article.

It is a two unit work shop course must be taken to account in the educational program. The resident should statistically analyze data, extract the results and write the thesis under the supervision of the supervisor and statistical consultant. The resident is obliged to write and submit at least one paper to a valid journal. If the research is to be done in more than one semester, the resident must analyze and extract the primary results.

Thesis (5)- Aim: Defense of thesis

This is a two unit work shop course that should be considered in the educational program. The resident must complete the thesis, present his findings and defend the thesis.

Notice: It is apparent that all researches may not follow this sequence and timing and may require more time. It is possible to extend the performance to reschedule the dead line only with the confirmation of the vice dean of research.

Unit title: restorative dentistry preclinic (1)

Unit code: 39

Number and type of unit: 3 practical units

Educational hours within the course duration: 102 h

Prerequisites: -

Aims

Familiarity with devices used in restorative dentistry, correct cavity preparation and tooth restoration with amalgam and administration of pins in extended cavities and their restoration, preparation and restoration of cavities with composites

Subtitles

1. Cavity preparation of classic cavities for amalgam on den tics
2. Restoration of classic cavities with amalgam
3. Administration of intra dentin pins in extended cavities on den tics
4. Restoration of extended cavities with amalgam
5. Cavity preparation for composite restoration on den tics
6. Composite restoration of cavities

Educational method: seminars, practical education

Evaluation method: correct execution of cavity preparation and restoration

Unit title: restorative dentistry preclinic (2)  
Number and type of unit: 2 practical units  
Educational hours within the course duration: 68 h  
Prerequisites: restorative dentistry preclinic (1)  
Aims

Unit code: 40

Preparation for metal and non-metal inlay-onlays

#### Subtitles

1. Fabrication of metallic inlays and onlays
  - Tooth preparation
  - Impression
  - Dye preparation
  - Wax up
  - Casting
  - Checking
  - Finishing and polishing
  - Cementation
2. Fabrication of composite onlays
  - Tooth preparation
  - Impression
  - Dye preparation
  - Fabrication of composite onlays and polymerization (laboratory)
  - Checking
  - Finishing and polishing
  - Cementation
3. Fabrication of porcelain inlays and onlays
  - Tooth preparation
  - Impression
  - Dye preparation
  - Powder application
  - Checking
  - Finishing and polishing
  - Cementation

Educational method: seminars, practical education

Evaluation method: correct execution of procedures



Unit title: diagnosis and treatment planning

Unit code: 41

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: -

Aims

Clinical examination, diagnosis and correct treatment planning for prevention and ideal treatment

#### Subtitles

1. Effective factors in restorative treatments
2. Clinical examinations
3. Examination of soft oral tissues
4. Examination of teeth
5. Examination of the periodontium
6. Examination of the occlusion
7. Evaluation of old restorations and reasons for their replacement
8. Diseases regarding restorative dentistry ( general diseases, dental lesions, their management and treatment and evaluation for carries)
9. Radiographic view of oral lesions (teeth, bone,...)
10. Radiographic imaging techniques for diagnoses of different lesions
11. Para clinical tests, their indications and interpretation
12. Treatment planning and its considerations
13. Prioritizing treatments
14. Factors effecting final treatment planning ( experience, physical and financial limitations)
15. Importance of periodic recall examinations
16. Teaching oral health care by dietary educations- introduction of mechanical preventive methods)

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: theoretical restorative dentistry (1)

Unit code: 42

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: -

Aims

Methods of cavity preparation and restoration with amalgam and methods of restoration of teeth with extensive carries with the application of pins

Subtitles

1. Introduction of restorative dentistry
2. Hand devices in restorative dentistry
3. Classification and terminology of hand and rotary devices
4. Application of hand instruments
5. Burs and rotary instruments
6. Patient's position, dental aid for better outcome and access during treatment
7. Materials and instruments for pain control (local anesthetics, ...)
8. Classification of cavities
9. Objective and stages of cavity preparation
10. Restoration of different cavity types and procedural stages of using amalgam
11. Pins
12. Indications and contraindications of pins
13. Side effects of pins

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: theoretical restorative dentistry (2)

Unit code: 43

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: theoretical restorative dentistry (1)

Aims

Familiarity with tooth colored restorations for anterior and posterior teeth and their application

Subtitles

1. Biological facts in restorative dentistry
2. Rubber dam and its applications in restorative dentistry
3. Principle of pulp protection
4. Principles of bonding to enamel and dentin
5. Principles of class 1,2,3,4,5, cavity preparation for direct composites
6. Restoration of composite cavities
7. Types of matrixes for composite restorations
8. Placement of composites
9. Finishing and polishing of composites

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: theoretical restorative dentistry (3)

Unit code: 44

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: theoretical restorative dentistry (2)

Aims

Familiarity with indirect composites and fabrication of composite and metal inlays and onlays.  
Applications of pins in dentistry.

Subtitles

1. Indirect composites

- Cavity preparation
- Impression
- Dye fabrication
- Fabrication of composite inlays and onlays and their polymerization
- Checking
- Polishing
- Cementation

2. Metal inlays and onlays

- Cavity preparation
- Impression
- Dye fabrication
- Wax up
- Checking
- Finishing and polishing
- Cementation

3. Pins and retention

- Types on dentin pins
- Complicated amalgam restoration (amalgam pin, slots, ...)
- Amalgam restoration with the use of bondings
- Pin application inside the root canal (prefabricated posts)

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: practical restorative dentistry (1)

Unit code: 45

Number and type of unit: 2 practical units

Educational hours within the course duration: 68 h

Prerequisites: restorative dentistry preclinic (1)

Aims

Correct tooth restoration with amalgam

Subtitles

1. Classic amalgam restoration of carries ( 30 teeth)

2. Complex amalgam restoration of carries ( 30 teeth)

3. Restoration of root canal treated teeth with do not require posts (20 teeth)

Educational method: practical procedures on patients

Evaluation method: correct execution of procedures, 360 degree evaluation

Unit title: practical restorative dentistry (2)

Unit code: 46

Number and type of unit: 4 practical units

Educational hours within the course duration: 136 h

Prerequisites: practical restorative dentistry (1)

Aims

Restoration of root canal treated teeth by using prefabricated posts. Metal and non-metal inlays and onlays and complex composite restorations.

Subtitles

1. Restoration of root canal treated teeth by using prefabricated posts Classic amalgam restoration of carries ( 8 teeth)
2. Restoration of teeth by using dentin pins (20 teeth)
3. Complex amalgam restorations (amalgam pin, slots) (22 teeth)
4. Amalgam restorations with bondings (14 teeth)
5. Metal casting restorations (inlays and onlays) (6 teeth)
6. Indirect composite restorations (inlays and onlays) (12 teeth)
7. Complex composite restorations (16 teeth)

Educational method: practical procedures on patients

Evaluation method: constant presence, correct execution of procedures, 360 degree evaluation

Unit title: practical restorative dentistry (3)

Unit code: 47

Number and type of unit: 4 practical units

Educational hours within the course duration: 136 h

Prerequisites: practical restorative dentistry (2)

Aims

Complex esthetic restorations

Subtitles

1. Complex composite restorations (esthetics- diastema closure- veneers,...) (25 teeth)
2. Restoration of root canal treated teeth (15 teeth)
3. Vital and non-vital bleaching) (10 teeth)
4. Splint therapy (5 teeth)
5. Fabrication of casting posts (4teeth)
6. Crown fabrication (4teeth)

Educational method: practical procedures on patients

Evaluation method: constant presence, correct execution of procedures, 360 degree evaluation

Unit title: practical restorative dentistry (4)

Unit code: 48

Number and type of unit: 4 practical units

Educational hours within the course duration: 136 h

Prerequisites: practical restorative dentistry (3)

Aims

Advanced and esthetic restorations

Subtitles

1. Porcelain restoration (inlay, onlay) (6 teeth)
2. FRC posts (8 teeth)
3. FRC bridges (4 teeth )
4. Maryland bridge (4 teeth)
5. Conventional bridges (2 teeth)

Educational method: practical procedures on patients

Evaluation method: constant presence, correct execution of procedures, 360 degree evaluation



Unit title: practical restorative dentistry (5)

Unit code: 49

Number and type of unit: 3 practical units

Educational hours within the course duration: 102 h

Prerequisites: practical restorative dentistry (2)

Aims

Treatment planning and execution of all restorative treatments

Subtitles

Residents must be able to propose a comprehensive treatment plan and deliver all restorative treatment according to standards

Educational method: practical procedures on patients

Evaluation method: constant presence, correct execution of procedures, 360 degree evaluation

Unit title: esthetic dentistry (1)

Unit code: 50

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: -

Aims

Basics of esthetics and bondings in dentistry

Subtitles

1. Principles of esthetics in form and symmetry, position of teeth in the jaw, surface features of color, translucency
2. Histology of enamel and dentin
3. Physical principles of bondings
4. Enamel bondings
5. Dentin bondings
6. Factors effecting bonding
7. Mechanism of bonding t dentin and factors effecting it

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: esthetic dentistry (2)

Unit code: 51

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: esthetic dentistry (1)

Aims

Restoration of discolored teeth

Subtitles

1. Conservative corrections of the contour and tooth contact points
2. Etiology of discoloration and methods of bleaching
3. Micro abrasion and macro abrasion
4. Resin veneers
5. Indirect composite veneers
6. Posterior composites
7. Conservative bridges

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: esthetic dentistry (3)

Unit code: 52

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: esthetic dentistry (2)

Aims

Porcelain restorations and their indications and contraindications

Subtitles

1. Porcelain inlays and onlays
2. Indications and contraindications of porcelain inlays and onlays
3. Porcelain crowns
4. Indications and contraindications of porcelain crowns
5. Porcelain veneers
6. Indications and contraindications of porcelain veneers
7. Tooth preparation for porcelain veneers
  - Tooth preparation for porcelain inlays and onlays
  - Tooth preparation for porcelain crowns
8. Lab procedures for fabrication of porcelain restorations
9. Clinical procedures for porcelain restorations
10. Metal free bridges

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: carries and microbes associated with carries

Unit code: 53

Number and type of unit: 3 theoretical units

Educational hours within the course duration: 51 h

Prerequisites: -

Providing department: restorative dentistry and microbiology

Aims

Different theories regarding carries production and micro-organism associated with its production.

Evaluation methods, risks for carries and preventions

Subtitles

1. Definition of carries
2. Different theories regarding carries and its pathophysiology
3. Microbial flora of the mouth, microbial plaque and its formation
4. Micro-organisms associated with carries
5. Ecological principles of carries
6. Carries epidemiology and the role of carbohydrates in carries
7. Carries, their classification and new systems of classification
8. Histopathology of different zones of carries
9. Carries progression and defensive mechanisms of the mouth and teeth from carries (saliva and dentin)
10. Modern methods for carries detection
11. Diagnosis of carries by radiography
12. Carries risk assessment
13. Prevention of carries (hygiene, local and systemic fluoride- sealants and anti-bacterial material)

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: carries and evaluation of related articles (2)

Unit code: 54

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisites: carries and microbes associated with carries

Aims

Revision of valid regional and foreign articles regarding diagnosis, incidence and prevention of carries

Subtitles

1. Review of articles regarding new methods for carries detection
2. Review of articles regarding the incidence of carries and different social groups
3. Evidence based effect of preventive methods

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: direct gold (adhesive)

Unit code: 55

Number and type of unit: 1 theoretical unit

Educational hours within the course duration: 17 h

Prerequisites: -

Aim

Applications of direct gold (adhesive)

Subtitles

1. Types of adhesive gold
2. Indications and contraindications
3. Cavity preparation for class 1,2,5 cavities
4. Application of direct gold
5. Review of articles regarding direct gold

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: tooth morphology

Unit code: 56

Number and type of unit: 1 practical unit

Educational hours within the course duration: 34 h

Prerequisites: -

Aim

Carving the form of teeth in chalk or wax on an articulator

Subtitles

1. Carving maxillary and mandibular anterior teeth
2. Carving maxillary and mandibular premolars
3. Carving maxillary and mandibular molars
- 4.

Educational method: seminars, practical education

Evaluation method: correct performance and one final carving



Unit title: basic dental materials (1)                      Unit code: 57

Number and type of unit: 1 theoretical unit

Educational hours within the course duration: 17 h

Prerequisite: -

Providing department: department of dental materials and restorative dentistry

Aim:

Familiarity with properties of materials, color, polymers and its types, cements and its types

Subtitles

1. Physical mechanical- thermal and electrical properties of materials
2. Definition of color
3. Spectrophotometry
4. Cilab
5. Chroma-hue- value
6. Transparency
7. Polymers
8. Fabrication of polymers
9. Polymerization and its types
10. Biocompatibility of dental materials
11. Cements and their properties
12. Zinc silico-phosphate cements
13. Zinc phosphate cements
14. ZOE cements
15. Zinc poly-carboxylate cements
16. Glass ionomer cements
17. Cavity liners
18. Calcium hydroxide

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: dental materials (2)                      Unit code: 58

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisite: basic dental materials (1)

Providing department: department of dental materials and restorative dentistry

Aim:

Metals, dental amalgams, its structure and properties

Subtitles

1. Metals:

- General principles of metals, crystalline structure of metals, metal deformation, fracture of solids, natural alloys
- Classification of alloys, eutectic, intermetallic, solid solutions
- Diagrams: eutectic, intermetallic, solid solutions, triple diagrams, properties of metals, microscopic structure of metals and alloys, solidification of alloys, casting infrastructure, cold worked infrastructure, recrystallization and grain growth, strengthening techniques

2. History and physical, mechanical, thermal and electric properties of amalgam

3. Composition and the production of amalgam

4. Silver alloys and tin and methods of amalgamation

5. low and hi copper amalgam

6. microstructure of amalgam

7. corrosion and tarnish

8. manipulation of amalgam (selection, mixing and condensation)

9. burnishing, finishing and polishing of amalgam

10. Mercury toxicity and protection against it

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam

Unit title: dental materials (3)                      Unit code: 59

Number and type of unit: 2 theoretical units

Educational hours within the course duration: 34 h

Prerequisite: basic dental materials (2)

Providing department: department of dental materials and restorative dentistry

Aim:

Familiarity with the properties of composites, physical, mechanical and other properties and applications of ceramics in dentistry

Subtitles

1. Composites
  - Introduction of composites and its history
  - The structure and chemical composition of composites
  - Polymerization of composites
  - Physical properties of composites
  - Mechanical properties of composites
  - Biocompatibility of composites
  - Application of composites
2. Dental ceramics
  - Raw materials in the ceramic industry
  - The structure of dental ceramics
  - Porcelain
  - glass
  - glass ceramics
3. Types of dental ceramics
  - Feldspatic
  - Cast able
  - Press able
  - Zirconia
  - Machinable
4. Understanding the production of ceramics
5. Physical, mechanical, chemical, light and thermal properties of ceramics
6. Methods of ceramic fabrication
7. Application of different types of ceramics

Educational method: seminars, small group discussion

Evaluation method: MCQ, written exam