

In the Name of God

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

**Dental Biomaterials
Degree: Doctor of Philosophy (PhD)**

Total Course Credits

- Compensatory: 4
- Core: 30

Program Description

Dental Materials is a basic science which deals with the composition, modification in composition, fabrication, characterization and evaluation of dental biomaterials' properties. There are different types of dental materials due to their intended purposes e.g. restorative materials, endodontic materials, impression materials, orthodontic materials, dental implants and etc.

Furthermore, it includes the application of the analytical techniques of materials science to the characterization and mechanical testing of dental materials. The biological tests are also performed on these materials to consider their biocompatibility.

We are concerned with the education of dentists who wish to advance their knowledge and research skills in the field of dental materials to the highest qualification standards. Professional excellence and integrity in education is considered with the highest professional ethical consideration.

The mission of this program is to provide education and training candidates in this field. Ultimately, it may lead to improve oral care and human health. The graduates will be qualified to teach in the dental faculties. Also, they develop their research skills based on national or international priorities.

Duration of the course

In the four-year full time Ph.D program in dental materials, students will be trained both in education and research skills. According to this program, the students have a challenge in managing course work while designing and starting a thesis research project. The first two years consists of taught courses based on core and non-core courses. At the end of second year, a final examination will be held and those pass the final exam will be upgraded to complete their thesis research projects. In final stage, they will satisfy the requirements of the Ph.D program. Upon completion of the Ph.D program in dental materials science, all students are required to complete their research dissertation as well as the acceptance of at least 2 articles in the ISI indexed journals based on the students' original research work. The dissertation consists of 20 units. The strategic of research is based on regenerative dentistry. This dynamic research is collaborative multidisciplinary with current research including tissue engineering, nano-materials. Also, the main concern will be on the creation, analysis, and testing the novel synthetic materials.

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:

- Knowledge on the dental materials' composition and properties
- Characterization and testing of dental materials
- Designing research projects based on priorities and clinical demands.
- Development of new dental materials
- Collaboration with industry in order to test and improve manufactured products
- Innovation in the field of dental materials, tissue engineering and "regenerative dentistry"

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/>.

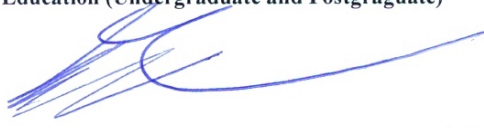
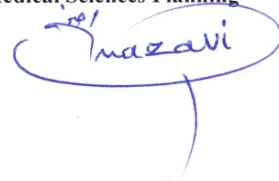
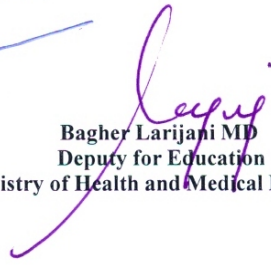
Tables of the Courses

Table 1: Core courses

| Code of the course | Course Title | Units and course types | | | Total hours of the course | | | Total units |
|--------------------|--|------------------------|-----------|----------|---------------------------|-----------|----------|-------------|
| | | Theoretical | Practical | Workshop | Theoretical | Practical | Workshop | |
| 3 | Applied chemistry | 2 | | | 34 | | | 2 |
| 4 | Applied physics | 2 | | | 34 | | | 2 |
| 5 | Applied mechanics-biomechanics | 2 | | | 34 | | | 2 |
| 6 | Materials sciences | 2 | | | 34 | | | 2 |
| 7 | Polymer and impression Materials | 3 | | | 51 | | | 3 |
| 8 | Metals and Dental Alloys | 3 | | | 51 | | | 3 |
| 9 | Non-restorative materials | 2 | | | 34 | | | 2 |
| 10 | Casting and investment materials | 1 | 1 | | 17 | 34 | | 2 |
| 11 | Direct esthetic restorative materials and dental cements | 3 | | | 51 | | | 3 |
| 12 | Dental ceramics | 2 | | | 34 | | | 2 |
| 13 | Biocompatibility | 1 | 1 | | 17 | 34 | | 2 |
| 14 | Practical dental materials | | 2 | | | 68 | | 2 |
| 15 | Testing of dental materials properties | | 1 | | | 34 | | 1 |
| 16 | Applied experimental equipments | | 2 | | | 68 | | 2 |

Table 2: Compensated Courses

| Code of the course | Course Title | Units and course types | | | Total hours | | | Total units |
|--------------------|-------------------|------------------------|-----------|----------|-------------|-----------|----------|-------------|
| | | Theoretical | Practical | Workshop | Theoretical | Practical | Workshop | |
| 1 | Statistics | 1 | 1 | | 17 | 34 | | 2 |
| 2 | Medical Education | 1 | 1 | | 17 | 34 | | 2 |

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| <p>Saeed Asgary DDS Secretariat of the Council for Dental Education (Undergraduate and Postgraduate)</p>  | <p>Seyed Mansour Razavi MD Secretary of the Supreme Council for Medical Sciences Planning</p>  |
|  <p>Bagher Larijani MD Deputy for Education Ministry of Health and Medical Education</p> | |