In the Name of God

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

Anatomical Sciences

Degree: Master of Science (M.Sc.)

Total Course Credits

- Core: 23
- Non-core (Electives): 3
- Thesis (M.Sc.): 6
  Total: 32

Program Description

The field of Anatomical Sciences (AS) is one of the most important branches of Basic Medical Sciences (BMS), focusing on the study of the macroscopic, microscopic, and developmental structures of the human body. In the Anatomical Sciences MSc curriculum, students delve into the intricacies of human anatomy, including studying cells, tissues, organs, and systems. Through cadaveric dissections, imaging techniques, and advanced technologies, students gain a comprehensive knowledge of the human body's organization. In recent years, the boundaries of anatomical sciences have expanded into practical areas, such as Stem Cells, Cell Therapy, Regenerative Medicine, Tissue Engineering, Reproductive Biology, and Neurosciences. The program equips students with the skills to contribute to medical advancements through a deep understanding of anatomical sciences.

Definition

The field of AS is a branch of BMS in which M.Sc. graduates become experts in the human body structure in 4 fields of Macroscopic or Gross Anatomy, Developmental Anatomy or Embryology, Microscopic Anatomy or Histology, and Cell Biology. Graduates contribute to the growth of the field by disseminating its theoretical and practical aspects, advancing knowledge through research and innovation, and promoting public health by developing high-level, informatics-based solutions.

Vision

To inspire a deep understanding and appreciation of the human body through innovative, engaging, and comprehensive anatomical education, our program aims to empower students to become skilled and compassionate healthcare professionals who are well-equipped to contribute to the advancement of medical science.

Mission

The mission of this program is to train competent and responsible graduates who, while acquiring specialized scientific and practical skills, can, after familiarization with teaching and research methods and techniques in the field of AS and understanding the features of the human body from Macroscopic,

Microscopic, and Developmental perspectives, use macro- and micro-anatomical methods in education and research. Considering modern educational and research methods, graduates of this field will be able to apply their expertise to meet societal needs and improve public health. Also, the curriculum fosters critical thinking and problem-solving skills in the field of Anatomical Sciences. Through hands-on learning experiences, cutting-edge technology, and interdisciplinary collaboration, we aim to cultivate a community of lifelong learners who are dedicated to the pursuit of knowledge and excellence in the AS.

Aims

The aims of this field include:

- Familiarity with basic concepts, methods, techniques of teaching, research, and service provision in the health system within the field of AS
- Understanding and describing the characteristics of the human body's structure from macro, micro, and developmental perspectives
- Understanding and applying Macroanatomy and Microanatomy methods in teaching and research
- Conducting research projects to generate knowledge, promote understanding, and develop skills
- Familiarity with the University's technology ecosystem
- Knowledge transfer, commercialization, and entrepreneurship in the field of anatomical sciences
- Familiarity with social responsibility, teamwork, managerial skills, professional behavior, and continuous education

Admission Requirements

Passing the entrance exam in accordance with the regulations and guidelines of the Ministry of Health and Medical Education

• Holding a Bachelor's degree in one of the following fields: Anatomical Sciences, Anatomy, Histology, Biology (all disciplines), Physiotherapy, Orthotics and Prosthetics (artificial limbs and assistive devices) or Orthopedic Technology, Occupational Therapy, Audiology, Optometry, Speech Therapy, Nursing, Midwifery, Anesthesia, Operating Room Technology, Laboratory Sciences, Radiation Therapy Technology, Radiology Technology, Nutrition Sciences, Public Health, Pre-hospital Emergency Medicine (Medical Emergencies), Biomedical Engineering, Physical Education, and Sports Sciences (all disciplines)

General expected competencies

Graduates of the Department of Anatomical Sciences will be capable of playing a leading role regionally and internationally within the next ten years by utilizing modern and practical training, advanced teaching and research techniques, and technology. Additionally, by integrating fundamental and clinical research with purpose, they will enhance the field of AS.

The general competencies expected for graduates of this level include skills in:

• Communication and interaction
• Teaching
• Research and scientific article writing
• Problem-solving and critical thinking
• Evidence-based management
• Professionalism
• Ethical behavior

Specific Competencies and Skills (Special Qualifications)

1. Advanced knowledge of human anatomy: Students are expected to have a detailed

understanding of the structure and function of the human body and embryo at a microscopic and macroscopic level. Proficiency in anatomical terminology and advanced dissection techniques are also important.

2. Research skills: Competencies in research design, methodology, data collection, analysis, and interpretation are essential for conducting meaningful research in anatomical sciences.

3. Digital anatomy: Proficiency in using digital tools and software for anatomical visualization, such as virtual dissection programs and anatomical modeling software.

4. Histology: Competencies in histological techniques, including tissue processing, staining, and microscopy, and histological analysis are important for studying the cellular structure of tissues.

5. Imaging modalities: Understanding and interpretation of various imaging techniques used in anatomical sciences, such as MRI, CT scans, ultrasound, and radiography.

6. Professional development: Skills related to networking, collaboration, and ethics in anatomical research and practice.

7. Interdisciplinary approach: Connect anatomical concepts with other disciplines such as physiology, pathology, biomechanics, and genetics to show the interrelated nature of the human body.

Educational Strategies, Methods, and Techniques

This program is based on the following strategies:

- Task-based education
- Evidence-based education
- Lab-based education
- Problem-based learning
- Software, tools, and simulation-based education

Assessment (Methods and Types)

Comprehensive assessment (Student assessment):

Evaluation methods: Students will be assessed using the following methods:

- Written exams
- Oral exams
- Evaluation of reports and results of assigned team tasks
- Assessment based on OSLE (Objective Structured Learning Experience) and OSPE (Objective Structured Practical Examination)
- Portfolio assessment, including logbook, articles, encouragements and reminders, certificates of completed work, and similar documents.

Ethical Considerations

Laboratory educational and research activities should:

- Avoid contaminating themselves, others, the laboratory, and especially the environment. (These regulations are prepared by the relevant educational group)

• Respect health and safety issues related to human subjects and seriously consider maintaining their dignity, honor, and confidentiality of such samples, ensuring strict compliance.

• Comply with regulations related to the implementation procedures, dress code, and professional ethics of students in laboratory-clinical environments.

• Strictly observe the related ethical regulations in case of working with animals.

• When performing autopsies, adhere precisely to legal, ethical, and religious standards.

• Observe professionalism in behavior.

• Protect the resources and equipment used in their work.

• Adhere to ethical principles in interactions with professors, staff, peers, and learners, and contribute to creating a sincere and respectful work environment.

• When evaluating programs, uphold principles of fairness, transparency, and professionalism.

• Follow research ethics when conducting studies related to the field.

Table of Courses

Table A. Compensatory Courses (Non-Core) in the Master's Degree in Anatomical Sciences

Code	Course Title	Credits			Hours			Prerequisite or concurrent
		Theoretical	Practical	Total	Theoretical	Practical	Total	
01	General Physiology	1.5	_	1.5	26	-	26	
02	General Pathology	1.5	0.5	2	26	17	43	
03	Biochemistry	1	-	1	17	-	17	
04	English for Specific Purposes	2	-	2	34	-	34	
05	General Anatomy	1.5	0.5	2	26	17	43	
06	Medical Informatics Systems	0.5	0.5	1	9	17	26	
07	Research Methods and Biostatistics	1	-	1	17	-	17	Medical Informatics Systems
Total		9	1.5	10.5				

Note: In addition to the course units, students are required, upon the recommendation of the academic group and approval of the Graduate Studies Council, to pass all or some of the compensatory courses listed in Schedule A. Passing these courses is mandatory for all students who have not previously completed them.

**Medical informatics systems are mandatory*

Table B: Mandatory Specialized Courses (Core) of the Master's Degree in Anatomical Sciences

Code	Course Title	Credits			Hours			Prerequisite or concurrent
		Theoretical	Practical	Total	Theoretical	Practical	Total	
01	Trunk Anatomy	3	1	4	51	34	85	
02	Limb Anatomy	1.5	1	2.5	26	34	60	
03	Head and Neck Anatomy	1.5	1	2.5	26	34	60	
04	Neuroanatomy	1.5	.5	2	26	17	43	
05	Macro- and Microanatomy Techniques	.5	1	1.5	9	34	43	
06	Cell and Molecular Biology	1	-	1	17	-	17	
07	General Histology	1	.5	1.5	17	17	34	
08	Specific Histology	1.5	.5	2	26	17	43	
09	General Embryology	1	.5	1.5	17	17	43	
10	Specific Embryology	1	.5	1.5	17	17	43	
11	Clerkship 1	-	1	1	-	51	51	
12	Clerkship 2	-	1	1	-	51	51	
13	Principles of Anthropology	.5	.5	1	9	17	26	
14	Thesis	6		6				
Total				29				

Table C. Elective Specialized Courses (Non-core) of the Master's Degree in Anatomical Sciences

Code	Course Title	Credits			Hours			Prerequisite or concurrent
		Theoretical	Practical	Total	Theoretical	Practical	Total	
01	Advanced Techniques in Anatomy Sciences	.5	.5	1	9	17	26	Macro-and Microanatomy Techniques
02	Teaching Methods in Anatomy Sciences	1	-	1	17	-	17	
03	Basic Stem Cell Biology	.5	.5	1	9	17	26	Macro- and Micro-anatomy Techniques
04	Cell Culture	.5	.5	1	9	17	26	
05	Artificial Intelligence	1	-	1	17	-	17	Medical Informatics Systems, Nervous System Anatomy
06	Anatomical Models	.5	.5	1	9	17	26	Limb Anatomy, Neck and Head Anatomy, Nervous System Anatomy, Specific Histology, Specific Embryology, all simultaneously
07	Anatomy Education Technology	1	-	1	17	-	17	Trunk Anatomy, Limb, Head and Neck Anatomy Medical Informatics Systems
Total		5	2	7				

Students must pass 3 units from the above courses, appropriate to their thesis topic, with the approval of their supervisor, the academic group, and the confirmation of the Graduate Studies Council of the Faculty.