IN THE NAME OF GOD

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

Food Microbiology

Master of Science (MSc)

Total Course Credits

- Core: 22
- Non-core (Electives): 5
- Thesis: 5

Program Description

Since the old times, man has investigated the etiology of food infections. This science contains knowledge about the etiological causes of infective diseases caused by microscopic organisms. These organisms belong to bacteria, fungi, viruses and protozoa. Once entering the human body, a challenge will begin between the host's immune system and these microorganisms. Therefore, it can be concluded that disease occurs due to the action by the pathogens and responses by the host's immune system. Host defense responses link to humeral and cellular immune mechanisms and the immunity caused by these mechanisms. Infective diseases can occur in various locations and times in endemics, epidemics or pandemics form. The infective agent is hidden in an infection source. The most important infection sources include patients, carriers, stray animals and those who shed infective agents in urine and feces or are in contact with foods. Infection transmission from the infection source to the host occurs directly or indirectly. For example, infections can be transmitted by insects. Since the last part of the 20th Century,microbial genetics has developed significantly. Since the Pasteur's era, valuable research has been carried out on genetic engineering of microorganisms which has answered many questions. However, there is still a long way in front and man tries to complete research on food microbiology to make earth a better and safer place to live. This is the first time that a food microbiology degree is available.

Non-integratedMaster of Science in Food Microbiology belongs to medical basic sciences. Qualified graduates in this field contribute at educational, research or service levels todevelopments in the areas of food preservation, contamination and spoilage, and associated microbial infections.Graduates are expected to be able to:

1. teach food microbiology at all educational levels.
2. work in the research institutions as principal or collaborate investigators.
3. provide food microbiology services for quality control means in food, pharmaceutical and cosmetic industries and for the prevention of food-borne infections.
4. contribute as food safety officers at the public level by doing tests and analyzing results and also targeting contaminated foods and their potential hazards in the society.

The Master of Science in Food Microbiology degree belongs to medical basic sciences and serves the community using laboratory routine techniques for the identification of pathogenic microorganisms in food under commonly accepted standards. Furthermore, this knowledge is included in national research schemes and academic educational programs.It is believed that healthy food keeps human body and soul healthy, and this results in the upgrade of health and development in the society. Our beliefs, regulations and values are mostly derived from Islam, which especially focuses on individual and common health and sanitation that assumes our bodies as precious gifts from our lord. Therefore, education formed based on these rules can represent these values in the society. Since food microbiology originally investigates etiology of infective diseases to treat and prevent them, it can be

concluded that those taught through this program clearly participate in health upgrade process in the society and play a critical role to achieve this goal. Hopefully, this food microbiology course (with other medical basic sciences courses) will upgrade the individual skills of the food microbiology qualified graduates who are involved in food industries, quality control laboratories, research centers and inspection units.

Admission Requirements

- Having a bachelor degree in microbiology, laboratory sciences, nutrition sciences, food sciences, biochemistry and biology, or a professional doctorate degree in one of the areas of medicine, pharmacy and veterinary medicine awarded by one of the national or foreign universities approved by the Ministry of Health and Medical Education.
- Succeeding in entrance examination
- Participating in the interview
- Offering a resume
- Presenting Recommendation letters
- Meeting admission criteria based on the regulations of universities
  *Important Note: These general conditions do not necessarily exclude specific conditions of each specific institute or university.

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:

- Work as professional technicians in food laboratories.
- Develop skills in molecular biology
- Work with professional equipment
- Act professionally in microbial diagnostics
- Interpret test results
- Conduct national research
- Get updated by self-education

Educational Strategies, Methods and Techniques

Student Assessment (Methods and Types)

- Formative (quizzes and midterm exam)
- Summative (final exam)
- Comprehensive exam
- Methods of assessment: oral, OSLE, written, observation, clinical competence assessments
- Portfolio assessment: Log book, test results, reports, articles, certificates, promotions, etc.

Ethical Considerations

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

Table of the Courses

Table 1. Compensatory Courses

Code of the Course	Title of the Course	Credits			Teaching Hours			Prerequisite or concurrent courses
		Theoretical	Practical	Total	Theoretical	Practical	Total	
01	General Immunology	2	-	2	34	-	34	-
02	General Genetics	2	-	2	34	-	34	-
03	General Bacteriology	2	-	2	34	-	34	-
04	Essentials of Nutrition	2	-	2	34	-	34	-
05	Food Biochemistry	2	-	2	34	-	34	-
06	Applied Biochemistry	-	2	2	-	68	68	-
07	Statistics	3	-	3	51	-	51	-
08	Research Methodology	2	-	2	34	-	34	-
09	Information Technology (IT)*	0.5	0.5	1	9	17	26	-
10	Laboratory Animals	1	1	2	17	34	51	-
11	Molecular Cell Biology	2	2	2	34	-	34	-
	Total	18.5	5.5					

* Completing this course is obligatory for all students.

Table 2. Core Courses

Code of the Course	Title of the Course	Credits			Teaching Hours			Prerequisite or concurrent courses
		Theoretical	Practical	Total	Theoretical	Practical	Total	
12	Food Bacteriology (1)	2	-	2	34	-	34	3
13	Practical Bacteriology (1)	1	-	1	-	34	34	-
14	Food Bacteriology (2)	2	-	2	34	-	34	12
15	Practical Bacteriology (2)	-	1	1	-	34	34	13
16	Food Virology	1	-	1	17	-	17	-
17	Food Parasitology and Mycology	2	1	3	34	34	68	-
18	Industrial Microbiology	2	1	3	34	34	68	3
19	Food Toxicology and Microbial Metabolites	2	-	2	34	-	34	-
20	Food Biotechnology	1	1	2	17	34	51	10
21	Advanced Food Microbiology	2	-	2	34	-	34	-
22	Food Quality Control Systems	1	-	1	17	-	17	-
23	Seminars	1	-	1	-	-	-	-
24	Project	-	1	1	-	34	34	-
25	Thesis	-	-	5	-	-	-	-
	Total	**17**	**5**	**27**				

Table 3. Non-Core Courses

Code of the Course	Title of the Course	Credits			Teaching Hours			Prerequisite or concurrent courses
		Theoretical	**Practical**	**Total**	**Theoretical**	**Practical**	**Total**	
26	Food Biosafety	2	-	2	34	-	34	-
27	Essentials of Food Preservation	2	-	2	34	-	34	-
28	Food-borne Diseases Epidemiology	1	-	1	17	-	17	-
29	Food Preservatives	1	-	1	17	-	17	-
30	Microbiology Standards in Foods	1	-	1	17	-	17	-
31	Food Microbiological Risk Assessment	1	-	1	17	-	17	-
32	Water Microbiology	1	1	2	17	34	51	-
33	Disinfections and Antiseptics	1	-	1	17	-	17	-
	Total	**10**	**1**	**11**				

Note: Students should choose 5 credits (Related to the thesis) as specified by the department.

Jamshid Hajati PhD
Secretariat of the Council for Education of Health and Basic Medical Sciences (Undergraduate and Postgraguate)

Seyed Mansour Razavi MD
Secretary of the Supreme Council for Medical Sciences Planning

Bagher Larijani MD
Deputy for Education
Ministry of Health and Medical Education