In the Name of God
Islamic Republic of Iran
Ministry of Health and Medical Education
Deputy Ministry of Education

Bachelor of Science in Environmental Health Engineering

Total Course Credits

- Core: 30.5 credits
- Non-core (Elective): 3 credits
- General: 9 credits
- Basic: 14.5 credits
- Internship: 8 credits
- Total: 65 credits
- Compensatory: 37 credits

Program Description

Environmental health engineering is a broad and complex subject area that, at its core, seeks to understand the interactions of environmental factors with biological systems. Thus, exploration of environmental health necessitates concerted multidisciplinary approaches to understanding and addressing environmentally influenced health outcomes. Graduates can control the harmful impacts of pollutants or prevent their release into the environment by identifying the risk factors of environmental pollutants. Likewise, graduates must maintain and improve the level of health and hygiene of the society and solve the problems. So, environmental health aims to train students to solve problems in the following contexts:

- Supplying healthy food and water
- Analyzing mechanisms of environmentally transmitted diseases and how to prevent and control
- Treating and disposing sewage
- Treating and disposing solid and toxic waste
- Decreasing air, water, soil, food, and noise pollution
- Providing healthy housing environment and public places

Admission Requirements

Applicants must have been successfully graduated from associate degree of one of the following majors:

Occupational health

Public health

Public health – diseases control

Environmental health

Environmental protection technician

Environmental health assistant

Environmental technologies

Laboratory medicine

Applicants must have successfully completed one semester for language courses such as Persian or English language.

Table 1. Expected Competencies at the End of the Program

Competence	Description of professional tasks	Course code
Communication and interaction skills	Active participation in intra- and inter-department programs	15, 52
Management skills	Identification and study of environmental pollutants, sources of pollution and related diseases	18,19, 25, 28, 29, 30
	Data analysis and use of them in environmental health programs	51,10,04
	Determination of appropriate pollution control methods	28, 29, 30, 33, 25,49
	Planning for conducting environmental health programs	52, 40, 31, 15
Educating, consulting, and designing	Environmental health education for public and also in the executive areas such as guilds training	36, 37, 39,52, 38,15, 12
	Consulting in control of carriers e.g. insects and rodents, and application of pesticides	34, 40, 52
	Participation in consulting programs for health control of public places	40, 52, 34
	Participation in the design of water transmission lines, water distribution system, municipal and industrial wastewater collection system, and their operation and maintenance	52,38,36
	Participation in the design of air pollution control system	52,30, 20
	Participation in designing of collection, treatment, and disposal systems related to municipal, hazardous, industrial, medical, and nuclear solid waste	29, 52

	Participation in the preparation of reports regarding environmental assessment; health assessment and health risk assessment in national and international projects	42, 50
	Participation and consulting about the design and siting of environmental health units in health centers (radiography centers)	33, 41, 52
	Participation in siting of power plants, industries, waste landfills, and issues related to the sustainable development	50, 52, 29
	Participation in environmental health control of hospitals and infection control	52, 41, 34
Research	Cooperation in implementation of research projects related to environmental health (water, wastewater, air, and solid waste) according to the regional, country, provincial and local needs	44, 43, 30, 29, 25, 27
Environmental Health statues	Control of health status in public places such as schools and educational centers, restaurants and food preparation centers, stadiums, parks, swimming pools, laboratories and health centers, offices, hospitals, mosques, prisons, etc.	52, 41, 38, 37, 36, 34
	Control of foodstuffs hygiene status, sampling of suspicious foodstuffs, sending the samples to the laboratory and disposal of rotten foods according to the relevant instructions	37, 52
	Examination and control of wastewater and wastes, air pollutants, etc. along with planning to eliminate them	29, 30, 52, 27, 25
	Quantitative and qualitative monitoring and supervision of laboratories for measuring the quality and pollution of water, wastewater, air, and solid waste	18, 19, 29, 30
	Supervision and action in the field of health and protection issues of ionizing radiation sector, such as radiological medical centers	33
	Planning for reuse of water emanated from the treatment of municipal and industrial wastewater	27, 28, 25
	Investigation and health monitoring of municipal, hazardous, industrial, hospital, and nuclear solid wastes in all stages, including collection, separation, transfer, temporary storage, recycling, composting, disposal, etc.	29, 52
	Environmental monitoring of crisis and disaster management in emergencies	35
	Overseeing the execution of all environmental health laws and guidelines in the country	42
Providing services regarding the control and	Conduction projects in different contexts of environmental health	44, 52
	Implementation of article (13) of the law on food, beverage, cosmetics and hygiene products along with obtaining permission	37, 52

securement of environmental health	from the health center for closure of places and centers	
	Conducting experiments related to air pollution, water and wastewater, radiation hygiene, solid waste, and other necessary tests in the specialized laboratories of environmental health	18, 19, 29, 30, 33
	Implementation of all laws and guidlines related to environmental health	52, 42
Entrepreneurship	Design and providing technical and consulting services, executive affairs, and services for monitoring and controlling environmental pollutants, such as establishing trusted environmental laboratories in the field of identifying and analyzing urban environmental pollutants (urban, medical, industrial, agricultural, hazardous, , and nuclear) and providing the routine laboratory services through contracts for experiments.	52

Table 2. Expected procedural skills for graduated students

Course code	**Skill**	**Minimum number of times required to do the activity to achieve mastery of the skill**			
		Observation	Contribution	Done Independently	Total
30	• Sampling and calibration of air pollution monitoring devices • Measuring the concentration of air pollutants and flue gases	2	2	2	6
40	• Working with various instruments of insects catching • Conducting multiple methods for keeping, assemblage and transferring of insects • Illustration of important disease carriers samples via slides and identifying by laboratory slide • Working with various spraying pumps such as Hudson 10-liter spray	2	2	2	6

	pump Application of standard insecticide spraying methods, especially those against mosquitoes				
18,19	• Sampling from various water resources for testing of physical, chemical and microbial characteristics, • Wastewater sampling • Effluent sampling • Preparation of microbial growth culture, conducting the microbial tests on water and wastewater samples •	2	2	2	6
19	• Performing tests to assess the quality as well as physical and chemical characteristics of water and wastewater	2	2	2	6
26	• Collection of information, documents, and maps used in the design of water transmission and distribution networks • Preparation and design of the structure of water transmission and distribution networks • Working with the relevant software	2	2	2	6
24	• Preparation of wastewater collection plan and use of relevant software	2	2	2	6
09	• Cartography, surveying, and working with related software such as AutoCAD •	2	2	2	6
29	• Determination of physical	2	2	2	6

	and chemical characteristics of solid waste • Determination of solid waste collection routes • Microbial tests on solid waste, biogas sludge, and compost • Conducting tests to determine the characteristics and quality of compost				
37	• Foodstuffs sampling, contamination diagnosis tests and measurements of food additives Food quality control and microbial contaminants tests.	2	2	2	6
22	• Operating a variety of pumps and turbines related to water transmission and distribution as well as wastewater collection systems	1	1	1	3
33	• Inspecting of important centers related to atomic energy research reactors • Visiting nuclear medicine departments of educational and research University hospitals to control the environmental health	1	1	1	3
52,36, 41	• Sanitary inspection of public places, including hospitals, hotels, restaurants, laboratories and health centers, parks, stadiums, terminals, mosques and holy places, swimming pools, camps,	1	1	1	3

	prisons, slaughterhouses for livestock and poultry, gas stations, etc. (to fill the legal checklists of environmental health controls)				
37, 52	• Sanitary inspection of food preparation and distribution places (to fill the legal checklists of environmental health controls)	1	1	1	3
43, 44, 52	• Drafting proposal, citing and journals searching	1	1	1	3
38, 52	• Sanitary inspection of schools and educational institutions (to fill the legal checklists of environmental health controls)	1	1	1	3

Educational Methods and Techniques:

In this course, various educational methods and techniques are used:

- Task-based education
- Simultaneous student and teacher-based education
- Problem-oriented education
- Community-oriented education
- Subject-based education
- Evidence-based education
- Lab-based education

Student Assessment (Methods and Types)

All students will be assessed by project-based assessment, computer-based assessment, oral assessments, and written exams.

Ethical Considerations

Learners are expected to:

- Comply with the bill of rights of stakeholders
- Follow the safety regulations of staff and work environment

- Comply with dress code
- Strictly observe the ethical rules if working with animals
- Follow professionalism
- Protect resources and equipment to work under any circumstances
- Respect teachers, staff, peers, and other learners, and try to provide a friendly atmosphere in the workplace
- Observe social and professional ethical considerations in the critique of programs
- Observe ethical points of research in performing field-related studies

Tables of the Courses

Table 3. General Courses

Course code	Title of the Course	Hours			Total Credits
		Theory	Practical	Total	
1	Theoretical foundations of Islam	68	-	68	2
2	Islamic revolution	34	-	34	2
3	Islamic history and civilization courses	34	-	34	2
4	Introduction to Islamic sources	34	-	34	2
5	Exercise and physical Education (2)	1	-	34	1
6	Family and population knowledge	34	-	34	2
7	History of culture and civilization of Islam and Iran	34	-	34	2
	Total	13			

Table 4. Compensatory Courses

Course code	Title of the Course	Credits			Teaching Hours		
		Theory	Practical	Total	Theory	Practical	Total
1	General mathematics (1)	3	-	3	51	-	51
2	Computer and its application	1.5	0.5	2	26	25	51
3	General physics	2	1	3	24	51	85
4	General chemistry	2	1	3	34	34	68
5	General microbiology	1	1	2	17	34	51
6	Surveying and cartography	-	2	2	-	102	102
7	Biostatistics (1)	1	-	1	26	17	43
8	Environmental ecology	2	-	2	34	-	34
9	Health education and promotion	1	-	1	17	-	17

10	Principles of health service management	1	-	1	17	-	17
11	Environmental microbiology	1	1	2	17	34	51
12	Environmental chemistry	1	1	2	17	34	51
13	Fluids mechanic	2	-	2	34	-	34
14	Principals of water resources treatment and sanitation	1	-	1	17	-	17
15	Wastewater disposal in small communities	1	-	1	17	-	17
16	Workshops for civil infrastructure (water and wastewater piping and pumping)	2	-	2	-	102	102
17	Air quality	1	-	1	17	-	17
18	Principals of solid waste (1)	1	-	1	17	-	17
19	Application of disinfectants and sanitizers in environmental health	1.5	0.5	2	26	17	43
20	Sanitation in schools and educational institutions	1	-	1	17	-	17
21	Environment health in hospitals and control of infection	2	-	2	34	-	34
	Total	37					

Table 5. Basic Courses

Course code	Title of the Course	Credits			Teaching Hours		
		Theory	Practical	Total	Theory	Practical	Total
22	Static and strength of materials	2	-	2			
23	General mathematics (2)	3	-	3	51	-	51
24	Differential equations	3	-	3	51	-	51
25	Surface and groundwater hydrology	2	-	2	34	-	34
26	Principles of thermodynamics and heat transfer	2	-	2	34	-	34
27	Biostatistics (2)	1	0.5	1.5	9	26	35

28	Medical information systems	0.5	0.5	1	9	17	26
	Total	14.5					

Table 6. Core Courses

Course Code	Course Title	Credits			Teaching Hours		
		Theory	Practical	Total	Theory	Practical	Total
29	Processes and operations in environmental health	2	-	2	34	-	34
30	Hydraulic lab	-	1	1	-	51	51
31	Water transmission and distribution system	1.5	0.5	2	26	25	51
32	Runoff and wastewater collection	1.5	0.5	2	26	25	51
33	Water treatment	2	-	2	34	-	34
34	Wastewater treatment	3	-	3	51	-	51
35	Water quality management (causes, effects, and control)	2	-	2	34	-	34
36	Air pollution (causes, effects, monitoring and control)	1	1	2	17	34	51
37	Principles of solid waste (2)	1	1	2	17	51	68
38	English for the students of environmental health	2	-	2	34	-	34
39	Radiation health and protection	1.5	0.5	2	26	26	52
40	Engineering economics	2	-	2	34	-	34
41	Occupational health and safety	2	-	2	34	-	34
42	Environmental health management and vector control	1.5	-	1.5	26	-	26
43	Principles of research methodology	0.5	0.5	1	9	17	26
44	project	-	2	2	-	102	102
	total	30.5					

Table 7. Non-core Courses

Course Code	Title of the Course	Credits			Teaching Hours		
		Theory	Practical	Total	Theory	Practical	Total
45	Biotechnology in environmental health	1	-	1	17	-	17
46	Noise pollution	1	-	1	17	-	17
47	Principles of environmental assessment	1	-	1	17	-	17
48	Fundamentals and concepts of modeling in environmental health	1.5	0.5	2	26	17	43
49	Water safety plan for drinking water supply systems	2	-	2	34	-	34
	Total	7					

Table 8. Internship in the field of environmental health engineering

No	Title of the Course	Credits			Teaching Hours		
		Theory	Practical	Total	Theory	Practical	Total
1	Internship in environmental health	-	8	8	-	408	408