

Biostatistics

Master of Science (MSc)

Total Course Credits

- Core: 20
- Non-core (Elective): 6
- Thesis: 6

Program Description

Biostatistics is one of the main branches of basic medical sciences with an emphasis on its applied aspects in the fields of medical health and life sciences. Biostatistics focuses on the development and use of statistical methods to solve problems and answer questions in the fields of medicine, health, genetics and biology.

Graduates of the master's degree in biostatistics, in addition to being familiar with advanced methods of statistical analysis, should be able to provide consulting services to other researchers in addition to conducting research in this field.

Admission Requirements

- Bachelor's degree in all medical sciences majors
- Bachelor's degree in Statistics, Mathematics, Computer Science, Electrical Engineering, Industrial Engineering, Mechanical Engineering, and Computer Engineering, Environmental Health Engineering, Occupational Health and Safety Engineering, Medical Engineering,
- Doctorate in General Medicine, Dentistry, and Pharmacy, and Professional Doctorate in Veterinary Medicine

Expected Competencies at the End of the Program

General Competencies*

- Communication-Interaction Skills
- Education
- Research and writing scientific articles Critical thinking and problem-solving skills
- Evidence-based management skills (policy-making, planning, organizing, monitoring, supervision and control, evaluation) Familiarity with the concepts of social responsibility
- Ability to identify the country's needs in the field of health and provide suggestions to address them

Educational Strategies, Methods and Techniques*

- The following teaching methods and techniques will be mainly used in this course: Lecture, Lecture-based group discussion, Small groups, Question and answer, Exploratory problem solving, Intra-departmental conferences and seminars
- Discussion in small groups - Workshops - Journal club and book reading - Case presentation
- Use of learning systems (LMS) for blended teaching

- Use of simulation and distance learning techniques according to the possibilities

Student Assessment (Types and Methods)

As will be discussed in each lesson, learners will be assessed using a combination of the following methods:

- Written, Oral, Project Assessment, Computer-based Interactive Test, 360-degree test, Portfolio Assessment and Log Book Assessment

Assessment Frequency

- Intra-group tests are available to the teaching team. Typically, there will be two mid-term and end-of-term assessments in each lesson. Continuous assessment is also recommended in practical units.

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	Title	Theoretical		Practical		Internship		Total		Prerequisite or Concurrent Courses
		Credit	Teaching hours	Credit	Teaching hours	Credit	Teaching hours	Credit	Teaching hours	
01	Biostatistics Methods 1	2	34	-	-	-	-	2	34	-
02	Generalities of medicine	2	34	-	-	-	-	2	34	-
03	Principles and methods of epidemiology	1.5	26	0.5	18	-	-	2	44	-
04	Statistical calculations with computers	1.5	26	0.5	18	-	-	2	44	-
05	Medical information systems**	0.2	9	0.5	18	-	-	1	27	-
06	Principles and foundations of disaster risk management**	1	17	1	34	-	-	2	51	-

*The student is required to take all or some of the deficiency or compensatory courses (Table 1) as determined by the relevant educational department and approved by the University's Graduate Education Council.

**Taking these courses is mandatory for all students who have not previously taken them.

Table 2. Core Courses

Code	Title	Theoretical		Practical		Internship		Total		Prerequisite or Concurrent Courses
		Credit	Teaching hours	Credit	Teaching hours	Credit	Teaching hours	Credit	Teaching hours	
07	Statistical inference	3	51	-	-	-	-	3	51	-
08	Biostatistics Methods 2 (Linear and Nonlinear Models)	3	51	-	-	-	-	3	51	01
09	Biostatistics Methods 3 (Correlated Data Analysis)	3	51	-	-	-	-	3	51	07, 08
10	Survival data analysis in medical research	3	51	-	-	-	-	3	51	07, 08
11	Methods of designing and implementing biological studies	1	17	1	34	-	-	2	51	01, 03
12	Design and Analysis of Clinical Trials	3	51	-	-	-	-	3	51	08
13	Applied multivariate analysis	3	51	-	-	-	-	3	51	07, 08
14	Thesis	6								

Table 3. Optional/Elective Courses*

Code	Title	Theoretical		Practical		Internship		Total		Prerequisite or Concurrent Courses
		Credit	Teaching hours	Credit	Teaching hours	Credit	Teaching hours	Credit	Teaching hours	
15	Data mining principles and methods	2	34	-	-	-	-	-	-	04
16	Categorical data analysis	2	34	-	-	-	-	-	-	07, 09
17	Computational and Bayesian Statistics in the Life Sciences	2	34	-	-	-	-	-	-	07
18	Statistical simulation	2	34	-	-	-	-	-	-	07
19	Statistical methods in epidemiology	2	34	-	-	-	-	-	-	03
20	Nonparametric statistics	2	34	-	-	-	-	-	-	01
21	Principles of medical demography	2	34	-	-	-	-	-	-	01

*The student must take 5 credits from the courses in the table above, appropriate to the topic of the thesis, after approval from the supervisor.