In the Name of God

School of Pharmacy
Tehran University of Medical Sciences
Nutraceuticals and Food Supplements

Master of Science (MSc)

Total Course Credits:

General Courses: 7
Core Courses: 13
Elective Courses: 4 out of 9
Thesis: 4
Total: 28

Program Description:

The Master's program in Nutraceuticals and Food Supplements is a fundamental and applied science program in nutraceuticals and food supplements processing and analysis to health and wellness. This postgraduate program offers students the opportunity to develop in-depth theoretical knowledge and extensive laboratory skills in nutraceuticals and food supplements. In this course, students will not only learn about the types of bioactives and categories of different food supplements, but also become familiar with formulation techniques, analyzing methods and principles of quality control of nutraceuticals and food supplements. Additionally, students will learn about the principles of good manufacturing practices for production of dietary supplements.

Introduction:

Quality control of nutraceutical products requires professional employees with robust knowledge of both non-instrumental and instrumental techniques. It is obvious that there is a crucial demand for standardization procedures according to hyphenated instrumental techniques and principles to confirm the reliable quality of the nutraceutical products. The main challenge in achieving this goal is the lack of qualified expertise in the national laboratories and manufacturing quality control laboratories. This gap needs to be addressed diligently, and the proposed program is a step in that direction.

Course duration:

In order to obtain a Master's degree in Nutraceuticals and Food Supplements, students must acquire a total of 28 credits, equivalent to four semesters' of full-time study. Postgraduate students receive scientific training through courses, literature-based reports, final exams, a 10-

day practice in nutraceutical and supplement industries and completion of a researchbased master's thesis.

The Aims of the Course:

The purpose of this program is to train experts in the production, quality control and analysis of nutraceutical products. Graduates will be able to effectively handle challenges in nutraceutical industries, regulatory bodies and quality control laboratories.

Admission Requirements:

Applicants must adhere to Tehran University of Medical Sciences entrance policy for postgraduate students. To be eligible, applicants must:

1. Hold a bachelor's degree in biomedical science, biochemistry, human nutrition, human biology, food science, food and nutrition, physiology, pharmacy, pharmacology or other appropriate science field from a recognized institution.
2. Demonstrate proficiency in written and spoken English, an IELTS score of 6.0 or a TOEFL score of 550 (for applicants whose first language is not English).

Expected Competencies at the End of the Program:

General Competencies[1]:

- Communication skills
- Scientific writing
- Problem-solving and decision-making

Specific Competencies and Skills:

- Understand and articulate the principles and theories related to Nutraceuticals and Functional Foods
- Possess the ability to implement and keep abreast of the knowledge in the Nutraceuticals and Functional Foods field
- Recognize and select methods for processing, analyzing, and searching information related to Nutraceuticals and Functional Foods
- Develop experiments/research projects, discuss and summarize finding outcomes, generate new knowledge or products in Nutraceuticals and Functional Foods
- Committed to individual and group tasks, work collaboratively as a team, provide diverse creative perspectives. manage time efficiently, promote personal growth and that of colleagues, and exchange knowledge and experiences

1. General competencies expected of the graduates such as communication skills, critical thinking & problem-solving skills, professionalism ….

- Utilize cutting-edge technology for information retrieval, data collection, analysis, and interpretation using scientific principles and tools accurately. Communicate, convey, and present results proficiently through scientific articles, lectures, and international-level discussions
- Reference information sources, and conduct Nutraceuticals and Food supplements production with integrity and fairness

Educational Strategies, Methods and Techniques

Educational Strategies:

Different educational models based on the nature of the courses will be used in this program. These strategies include:

- A hybrid of Student-Based Learning and Teacher-Based Learning
- Task-Based Learning
- Problem-Based Learning (PBL)
- Evidence-Based Learning (EBL)
- Lab-based Learning
- Self-education, and self-study

Student Assessment (Types and Methods)

Formative Assessment[1]:

During the course, students are evaluated through monitoring their activities, whether performed independently or with the guidance of the instructor. This includes:

- Number of absents
- Number of ethical errors
- Completion of various projects
- Periodic written tests, midterm exams, and class quizzes

Summative Assessment[2]:

- Students should participate in final exams at the end of each semester for each course individually.
- Assessment based on Logbooks
- Completion of a dissertation

1. During the course, the residents are evaluated by monitoring their activities and how all the activities are carried out, reviewing the residents' reports, including the number of absences and leave days, medical and ethical errors, assessing by workplace-based assessment methods such as Mini-CEX, Direct Observation of Procedural Skills (DOPS), etc.
2. Residents should take part in the final exam at the end of the course. Summative assessment is conducted using multiple methods like clinical reasoning tests including key feature exam, script concordance test, performance-based

assessments can include a variety of objective structured tests such as OSCE (Objective Structured Clinical Examination), workplace-based assessments by the means such as Portfolio, Logbook, Global Rating Form (GRF), Multi Source Feedback (MSF), etc.

Ethical Considerations

The learners should,

- Strictly adhere to the patient bill of rights
- Strictly observe health and biosafety rules concerning patients, personnel and the workplace
- Strictly comply with the dress code
- Strictly observe the regulations of working with laboratory animals
- Carefully preserve resources and equipment
- Truly respect faculty members, staff, classmates and other students and strive to create an intimate and respectful atmosphere
- Observe social and professional ethical considerations in criticism

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

The overall structure of the course:

General Courses (7 Credits)

Code	1st semester Title of the Course	Number of Credits			Total hours of the course			Prerequisite or Concurrent Courses
		Theoretical	Practical	Total	Theoretical	Practical	Total	
01	**Bioactive compounds**	2	-	2	34	-	34	-
02	**Nutraceuticals and food Supplements**	2	-	2	34	-	34	-
03	**Research Methodology and Scientific Writing**	1	-	1	17	-	17	-
04	**Biostatistics**	1	1	2	17	34	51	-
Total		6	1	7				

Core Courses (13 Credits)

Code	Title of the Course	Number of Credits			Total hours of the course			Prerequisite or Concurrent Courses
		Theoretical	Practical	Total	Theoretical	Practical	Total	
05	Advanced analysis techniques of nutraceutical products	2	1	3	34	34	68	-
06	Application of biotechnology for nutraceuticals and functional foods	1	-	1	17	-	17	
07	Microbiology and microbiological quality of nutraceuticals	1	1	2	17	34	51	
08	Developing new nutraceutical products and food supplements	1	-	1	17	-	17	
09	Quality assurance and regulatory affairs in the Industries of Nutraceuticals and Functional Foods	1	-	1	17	-	17	05
10	Nutraceutical processing and packaging technologies	1	-	1	17	-	17	
11	Marketing of Nutraceutical products: label claims, consumer acceptance, future prospects	1	-	1	17	-	17	
12	Stability and physiochemical control of nutraceutical Products	1	-	1	17	-	17	09
13	Analytical method development and Validation	1	-	1	17	-	17	
14	Sensory Evaluation methods	1	-	1	17	-	17	
15	Thesis	-	4	4	-	-	-	
17	Practice in nutraceutical Industry (10 working days)	-	-	-				
Total		11	6	17				

Elective Courses (4 Credits)

Code	Title of the Course	Number of Credits			Total hours of the course			Prerequisite or Concurrent Courses
		Theoretical	Practical	Total	Theoretical	Practical	Total	
18	**Food safety and food integrity**	**1**	**-**	**1**	**17**	**-**	**17**	
19	**Design of Experiments (DoE)**	**1**	**1**	**2**	**17**	**34**	**51**	
20	**Nutraceuticals and functional foods for**	**1**	**-**	**1**	**17**	**-**	**17**	
	health and disease prevention							
21	**Chemometrics and Multivariate Analysis**	**1**	**1**	**2**	**17**	**34**	**51**	
22	**Food fortification and fermentation**	**1**	**-**	**1**	**17**	**-**	**17**	
23	**Physical properties of foods**	**1**	**-**	**1**	**17**	**-**	**17**	
24	**Food chemistry**	**1**	**-**	**1**	**17**	**-**	**17**	
Total		**7**	**2**	**9**	**-**	**-**	**-**	