In the Name of God

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

Medicinal Chemistry
Degree: Doctorate of Philosophy (PhD)

Total Course Credits
Core: 20
Non-core: 8 out of 10
Thesis: 22
Total: 50

Program Description
The field of Medicinal Chemistry is a branch of pharmaceutical sciences in which PhD students advance their studies in the areas of medicinal chemistry, organic chemistry and instrumental analysis in order to be qualified to design, synthesize and analyze medicines and bioactive agents.
The graduates will be able to have the theoretical and practical experience of the various aspects of the field, advance the frontiers of pharmaceutical knowledge by adding to the research literature as well as making innovations in the areas of drug design and synthesis and finally paving the way for advancement of pharmaceutical industry.

Aims and Objectives
The aim is to provide the graduate students with an integrated training in the areas of design, synthesis, and analysis of new chemical entities to pave the way for drug discovery and development of novel pharmaceutical products.

Admission Requirements
Candidates having Doctorate of Pharmacy (PharmD) or Master of Science degree (MSc) in one of the fields of medicinal, analytical or organic chemistry awarded by one of the domestic or overseas universities approved by the Ministry of Health and Medical Education are considered eligible to sit for the written entrance examination. Candidates must pass both written and oral entrance exam. They should also demonstrate proficiency in verbal and written English. Successful candidates will enter the program according to the PhD educational rules and regulations.*
*Important note: These general conditions do not necessarily exclude specific conditions of each 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:
- Design and synthesis of medicines.
- Analysis of medicines using different instrumental analysis methods.

Educational Strategies, Methods and Techniques*
Student Assessment (Methods and Types)
Methods of Assessment
PhD candidates will be evaluated by the following methods:
Written; Verbal; Logbook-based assessment.

Types of Assessment
Periodic, Comprehensive (final); Monitoring the progress and completion of the thesis.
Comprehensive exam
Students will take part in a comprehensive exam after passing their theoretical courses. The comprehensive exam consists of both written and oral evaluations.

Ethical Considerations*

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

Tables of the Courses

Table 1. Compensatory courses

Code of the Course	Title of the Course	Number of Credits			Hours			Prerequisite or Concurrent Courses
		Theoretical	Practical	Total	Theoretical	Practical	Total	
01	Medical Informatics Systems	0.5	0.5	1	9	17	26	-
02	General Pharmacology	3	-	3	51	-	51	-
03	Theoretical and Practical Instrumental Analysis	3	1	4	51	34	85	-
04	Professional Ethics	2	-	2	34	-	34	-
05	Research Methods and Advanced Statistics	2.5	0.5	3	43	17	60	-
Total		13						

*Student will be asked to pass all or part of compensatory courses (Table 1). The composition of these courses will be determined by the department in which the student is admitted according to student's background.

Table 2. Core courses

Code of the Course	Title of the Course	Credits			Hours			Prerequisite or Concurrent Courses
		Theoretical	Practical	Total	Theoretical	Practical	Total	
06	Advanced Biochemistry (Theoretical)	3	-	3	51	-	51	-
07	Advanced Pharmacology	2	-	2	34	-	34	General Pharmacology (02)
08	Advanced Organic Chemistry and Synthesis	3	-	3	51	-	51	-
09	Advanced Medicinal Chemistry 1 (Theoretical)	3	-	3	51	-	51	Advanced Biochemistry (06)
10	Advanced Medicinal Chemistry (Practical)	-	1	1	-	34	34	Advanced Medicinal Chemistry 1 (09)
11	Advanced Medicinal Chemistry 2	2	-	2	34	-	34	Advanced Medicinal Chemistry 1 (09)
12	Advanced Instrumental	2	-	2	34	-	34	Theoretical and Practical

	Analysis (Theoretical)							Instrumental Analysis (03)
13	**Heterocyclic Chemistry**	2	-	2	34	-	34	Advanced Organic Chemistry and Synthesis (08)
14	**Seminar 1**	1		1	-	-	34	Advanced Pharmacology (07) and Advanced Medicinal Chemistry 1 (09)
15	**Seminar 2**	1	-	1	-	-	34	Advanced Pharmacology (07) and Advanced Medicinal Chemistry 1 (09)
16	**Thesis**			22				
Total		**42**						

Table 3. Non- Core Courses (Electives)

Code of the Course	**Title of the Course**	**Number of Credits**			**Hours**			**Prerequisite or Concurrent Courses**
		Theoretical	**Practical**	**Total**	**Theoretical**	**Practical**	**Total**	
17	**Pharmaceutical Materials Synthesis (Practical)**	-	1	1	-	34	34	Advanced Organic Chemistry and Synthesis (08)
18	**Advanced Mathematics**	2	-	2	34	-	34	-
19	**Physical Chemistry**	4	-	4	68	-	68	-
20	**Computational Chemistry & Drug Design**	2	--	2	34	-	34	-
21	**Advanced Instrumental Analysis (Practical)**	-	1	1	-	34	34	Advanced Instrumental Analysis (Theoretical) (12)
Total		**10**						

Students must pass 8 out of 10 non-core courses on the basis of her/his background and thesis and decision of the department.

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