

BACHELOR OF SCIENCE IN MEDICINAL CHEMISTRY

Medicinal chemistry is a specialized area of chemistry with an emphasis on a study of drug design, drug synthesis, and pharmaceutical and biomedical analysis. The program will provide students with a strong background in traditional chemistry areas as well as a fundamental understanding of chemistry and biological and pharmacological actions of pharmaceuticals and biomedical products. Students will learn to apply biological, chemical, and data science to computer-aided design, synthesis, evaluation, and analysis of structurally diverse drugs for the detection, treatment, and cure of human diseases. The program will prepare students with the technical skills to develop a career in biomedical science, bioanalytical science, biotechnology, medicine, and pharmaceutical science.

Required Courses

Code	Title	Credit Hours
Medicinal Chemistry Requirements		(51)
CHEM 100	Introduction to the Profession	2
CHEM 124	Principles of Chemistry I with Laboratory	4
CHEM 125	Principles of Chemistry II with Laboratory	4
CHEM 237	Organic Chemistry I	4
CHEM 239	Organic Chemistry II	3
CHEM 240	Organic Chemistry Laboratory	2
CHEM 247	Analytical Chemistry	3
CHEM 321	Instrumental Analysis	4
CHEM 343	Physical Chemistry I	3
CHEM 344	Physical Chemistry II	4
CHEM 415	Inorganic Chemistry	3
CHEM 434	Spectroscopic Methods in Identification and Analysis	4
CHEM 456	Computational Biochemistry and Drug Design	3
CHEM 463	Analytical Method Development Laboratory	3
CHEM 467	Medicinal Chemistry	3
CHEM 485	Chemistry Colloquium	1
CHEM 495	Seminar in Special Topics	1
Medicinal Chemistry Electives		(6)
Select two courses from the following:		6
CHEM 416	Advanced Chemistry Laboratory	3
CHEM 452	Cheminformatics	3
CHEM 455	Advanced Organic Chemistry	3
CHEM 460	Bioanalytical Chemistry	3
CHEM 461	Bioanalytical Chemistry Laboratory	3
CHEM 473	Environmental Analytical Chemistry	3
CHEM 476	Forensic Chemistry Laboratory	3
CHEM 513	Statistics for Analytical Chemists	3
CHEM 538	Physical Biochemistry	3
Biology Requirements		(6-7)
BIOL 107 or BIOL 115	General Biology Lectures Human Biology	3
BIOL 401 or BIOL 403	Introductory Biochemistry Biochemistry	3-4
Mathematics Requirements		(18)
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4
Physics Requirements		(8)
PHYS 123	General Physics I: Mechanics	4

PHYS 221	General Physics II: Electricity and Magnetism	4
Computer Science Requirement		(2)
CS 105	Introduction to Computer Programming	2
or CS 110	Computing Principles	
Humanities and Social Sciences Requirements		(21)
See Illinois Tech Core Curriculum, sections B and C		21
Interprofessional Projects (IPRO)		(6)
See Illinois Tech Core Curriculum, section E		6
Free Electives		(9)
Select nine credit hours ¹		9
Total Credit Hours		127-128

¹ Suggested electives include: BIOL 210, BIOL 445, BIOL 514, BIOL 527, BIOL 550, ITMD 521, ITMD 525, and ITMD 527.

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		Year 1	
Semester 1	Credit Hours	Semester 2	Credit Hours
CHEM 124	4	CHEM 100	2
CS 105 or 110	2	CHEM 125	4
MATH 151	5	MATH 152	5
Humanities 200-level Course	3	PHYS 123	4
		Social Sciences Elective	3
14		18	
		Year 2	
Semester 1	Credit Hours	Semester 2	Credit Hours
CHEM 237	4	CHEM 239	3
BIOL 107 or 115	3	CHEM 240	2
MATH 251	4	CHEM 247	3
PHYS 221	4	MATH 252	4
Humanities or Social Sciences Elective	3	Humanities Elective (300+)	3
18		15	
		Year 3	
Semester 1	Credit Hours	Semester 2	Credit Hours
CHEM 321	4	CHEM 344	4
CHEM 343	3	CHEM 434	4
I PRO Elective I	3	CHEM 467	3
Social Sciences Elective (300+)	3	CHEM 485	1
Free Elective ¹	3	Humanities Elective (300+)	3
16		15	
		Year 4	
Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 401 or 403	3-4	CHEM 495	1
CHEM 415	3	Medicinal Chemistry Elective ²	3
CHEM 456	3	Medicinal Chemistry Elective ²	3
CHEM 463	3	I PRO Elective	3
Free Elective ¹	3	Social Sciences Elective (300+)	3
		Free Elective ¹	3
15-16		16	

Total Credit Hours: 127-128

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² Choose from the following courses: CHEM 416, CHEM 452, CHEM 455, CHEM 460, CHEM 461, CHEM 473, CHEM 476, CHEM 513, or CHEM 538.