

# 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
<b>Medicinal Chemistry Requirements</b>		<b>(51)</b>
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
<b>Medicinal Chemistry Electives</b>		<b>(6)</b>
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
<b>Biology Requirements</b>		<b>(6-7)</b>
BIOL 107 or BIOL 115	General Biology Lectures Human Biology	3
BIOL 401 or BIOL 403	Introductory Biochemistry Biochemistry	3-4
<b>Mathematics Requirements</b>		<b>(18)</b>
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4
<b>Physics Requirements</b>		<b>(8)</b>
PHYS 123	General Physics I: Mechanics	4

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

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

## Bachelor of Science in Medicinal Chemistry

		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
<b>14</b>		<b>18</b>	
		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
<b>18</b>		<b>15</b>	
		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 <sup>1</sup>	3	Humanities Elective (300+)	3
<b>16</b>		<b>15</b>	
		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 <sup>2</sup>	3
CHEM 456	3	Medicinal Chemistry Elective <sup>2</sup>	3
CHEM 463	3	I PRO Elective	3
Free Elective <sup>1</sup>	3	Social Sciences Elective (300+)	3
		Free Elective <sup>1</sup>	3
<b>15-16</b>		<b>16</b>	

**Total Credit Hours: 127-128**

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

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