BACHELOR OF SCIENCE IN BIOANALYTICAL CHEMISTRY

Bioanalytical chemistry is a study of chemical and biochemical methods and instrumental techniques for analysis and detection of biomolecules and biologically active molecules including small drugs, drug metabolites, proteins, peptides, antibodies, DNAs, enzymes, and biologics. Bioanalytical chemistry is a key discipline in biomedical and pharmaceutical research and applied to a study of biological processes, detection and diagnosis of human diseases, and preclinical and clinical evaluations of drugs and biopharmaceutical products in biological systems. This program provides students with an interdisciplinary background in bioanalytical principles and methods and applications of analytical chemistry to detection, characterization, and qualitative, quantitative, and instrumental analysis of biologically active molecules in biological systems. The program prepares majors with a strong background in traditional chemistry areas and the technical skills to develop a career in bioanalysis, biomedicine, biotechnology, clinical science, and pharmaceutical science.

Required Courses

Code	Title		Credit Hours
Bioanalytical 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 460	Bioanalytical Chemistry		3
CHEM 461	Bioanalytical Chemistry Laboratory		3
CHEM 463	Analytical Method Development Laboratory		3
CHEM 485	Chemistry Colloquium		1
CHEM 495	Seminar in Special Topics		1
Bioanalytical Chemistry Electives			**(6)**
Select two courses from the following:			6
CHEM 416	Advanced Chemistry Laboratory	3	
CHEM 452	Cheminformatics	3	
CHEM 467	Medicinal Chemistry	3	
CHEM 473	Environmental Analytical Chemistry	3	
CHEM 475	Forensic 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	General Biology Lectures		3
or BIOL 115	Human Biology		
BIOL 401	Introductory Biochemistry		3-4
or BIOL 403	Biochemistry		
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.

Bachelor of Science in Bioanalytical Chemistry Curriculum

			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
IPRO Elective I	3	CHEM 460	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	Bioanalytical Chemistry Elective[2]	3
CHEM 461	3	Bioanalytical Chemistry Elective[2]	3
CHEM 463	3	IPRO Elective II	3
Free Elective[1]	3	Social Sciences Elective (300+)	3
		Free Elective[1]	3
	15-16		**16**

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.

2 Choose from the following courses: CHEM 416, CHEM 452, CHEM 467, CHEM 473, CHEM 475, CHEM 476, CHEM 513, or CHEM 538.