

New Program Proposal

Viewing: : Bachelor of Science in Biochemistry with Artificial Intelligence

Last edit: 03/13/26 3:30 pm

Program Status	Active		
Requestor	Name	David Minh	E-mail
	dminh@illinoistech.edu		
Origination Date	2026-3-13		
Is this an interdisciplinary program?	Yes		
Is this an incubator program?			
Is this stem-eligible?	Yes		
Available for direct application?	Yes		
Academic Unit	Colg of Science Dean's Ofc		College
	Lewis College of Science and Letters		

Contributing Academic Unit(s)

Academic Units
Chemical Sciences
Biological Sciences
Physics

Program Title	Bachelor of Science in Biochemistry with Artificial Intelligence		
Effective Academic Year	2026 - 2027	Effective Term	Fall 2026
Academic Level	Undergraduate		

If all courses in a subject in your department are required, please enter each subject followed by the number ranges in the "Quick Add" field in the pop up box when you click the green plus button below. For example: ARCH 100-499.

What courses will factor the major GPA?	BIOL 100-499 - Course BIOL 100-499 not Found CHEM 100-499 - Course CHEM 100-499 not Found PHYS 100-499 - Course PHYS 100-499 not Found CS 100-499 - Course CS 100-499 not Found MATH 100-499 - Course MATH 100-499 not Found COM 200 - AI, Data, and Communications PHIL 381 - Artificial Intelligence, Philosophy and Ethics PHIL 372 - Ethics of Technology and Communication PHIL 381 - Artificial Intelligence, Philosophy and Ethics DS 151 - Introduction to Data Science
Program Type	Degree
Degree Type	Bachelor of Science (BS)
CIP Code	26.0202 - Biochemistry.
Program Code	
Program Attribute	
Total Program Credit Hours	120

Program Narrative and Justification

Narrative description of how the institution determined the need for the program. For example, describe what need this program will address and how the institution became aware of that need. If the program is replacing a current program(s), identify the current program(s) that is being replaced by the new program(s) and provide details describing the benefits of the new program(s). If the program will be offered in connection with, or in response to, an initiative by a governmental entity, provide details of that initiative.

This is a version of the Biochemistry program that incorporates AI certificate requirements.

Narrative description of how the program was designed to meet local market needs, or for an online program, regional or national market needs. For example, indicate if Bureau of Labor Statistics data or State labor data systems information was used, and/or if State, regional, or local workforce agencies were consulted. Include how the course content, program length, academic level, admission requirements, and prerequisites were decided; including information received from potential employers about course content; and information regarding the target students and employers.

Same as BS in Biochemistry

Narrative description of any wage analysis the institution may have performed, including any consideration of Bureau of Labor Statistics wage data related to the new program.

Same as BS in Biochemistry

Narrative description of how the program was reviewed or approved by, or developed in conjunction with, one or more of the following: a) business advisory committees; b) program integrity boards; c) public or private oversight or regulatory agencies (not including the state licensing/authorization agency and accrediting agency); and d) businesses that would likely employ graduates of the program. For example, describe the steps taken to develop the program, identify when and with whom discussions were held, provide relevant details of any proposals or correspondence generated, and/or describe any process used to evaluate the program.

This program revision was developed by the Biochemistry steering committee.

Admission Entry Details

Available Fall Admit	Yes	Available Spring Admit	Yes	Available Summer Admit
Yes				
Available On Campus	Yes No		Available Online	
Available Full-Time	Yes		Available Part-Time	
Yes				
Available International	Yes Yes		Available Domestic	

What are the enrollment estimates?

Year 1	5	Year 2	5	Year 3	5
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Attach Additional Program Justification Document(s)

Academic Information

Advising

Since quality advising is a key component of good retention, graduation, and career placement, how will students be mentored? What student professional organizations will be formed? How will the department work with the Career Services office to develop industry connections?

Students will be assigned a primary and secondary advisor based on their specialization with the primary advisor from the host department of each advisee's specialization. New students who have not formally selected a specialization will be randomly distributed between advisors who have the fewest advisees, in consideration of their expressed interest in specializations, at admissions advising sessions. Every fall, biochemistry students will be invited to an orientation event to introduce them to the specializations.

Program Resources

Which program resources are necessary to offer this program?

Proposed Catalog Entry

Admission
Requirements

Course Requirements

Required Courses

Biochemistry Requirements		(18)
<u>BIOL 301</u>	Introductory Biochemistry	3
<u>BIOL 402</u>	Metabolic Biochemistry	3
<u>BIOL 404</u>	Biochemistry Laboratory	3
<u>BIOL 412</u>	Advanced Biochemistry	3
<u>CHEM 438</u>	Physical Biochemistry	3
or <u>PHYS 410</u>	Molecular Biophysics	
<u>CHEM 456</u>	Computational Biochemistry and Drug Design	3
Biology Requirements		(15)
<u>BIOL 107</u>	General Biology Lectures	3
<u>BIOL 109</u>	General Biology Laboratory	1
<u>BIOL 115</u>	Human Biology	3

BIOL 117	Human Biology Laboratory	1
BIOL 214	Genetics	3
BIOL 445	Cell Biology	3
BIOL 495	Biology Colloquium	1
Chemistry Requirements		(17)
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	1
CHEM 485	Chemistry Colloquium	1
Biology or Chemistry classes		(4)
BIOL 100	Introduction to the Profession	2
or CHEM 100	Introduction to the Profession	
BIOL 451	Biological Literature	2
or CHEM 451	Undergraduate Seminar	
Certificate in AI Fluency		(9)
MATH 123	AI for Computational Mathematics and Coding	3
COM 200	AI, Data, and Communications	3
CS 180	Artificial Intelligence Foundations	3
Certificate in AI Management		(12)
DS 151	Introduction to Data Science	3
or BUS 102	Introduction to Business Analytics	
BUS 432	Artificial Intelligence in Business	3
Select one of the following		3
PHIL 381	Artificial Intelligence, Philosophy and Ethics	3
or PHIL 331	Political Philosophy of Artificial Intelligence	
or PHIL 372	Ethics of Technology and Communication	
or DS 261	Ethics and Privacy in Data Science	
Upper Division Laboratory		(3)
Select at least 3 credits of approved 300+ level lab classes, including:		3
BIOL 431	Animal Physiology Laboratory	3

BIOL 446	Cell Biology Laboratory	3
CHEM 321	Instrumental Analysis	4
CHEM 416	Advanced Chemistry Laboratory	3
CHEM 434	Spectroscopic Methods in Identification and Analysis	4
CHEM 461	Bioanalytical Chemistry Laboratory	3
CHEM 463	Analytical Method Development Laboratory	3
CHEM 476	Forensic Chemistry Laboratory	3
PHYS 300	Instrumentation Laboratory	4
BIOL 491	Biology Research Project	1 TO 3
CHEM 491	Undergraduate Research	1 TO 3
FDSN 494	Special Projects	1 TO 3
Technical Electives		(3) 3
Any 300+ level BIOL or CHEM or FDSN course		
BME 418	Reaction Kinetics for BME	3
CS 330	Discrete Structures	3
CS 331	Data Structures and Algorithms	3
CS 422	Data Mining	3
CS 484	Introduction to Machine Learning	3
PHYS 410	Molecular Biophysics	3
Physics Requirements		(8)
PHYS 123	General Physics I: Mechanics	4
PHYS 221	General Physics II: Electricity and Magnetism	4
or PHYS 223	General Physics III	
Mathematics Requirements		(10)
MATH 151	Calculus I	5
MATH 152	Calculus II	5
Statistics Requirement		(3-4)
Any statistics course, including:		3 or 4
STAT 225	Introductory Statistics	3
BUS 221	Business Statistics	3
PSYC 203	Undergraduate Statistics for the Behavioral Sciences	4
MATH 425	Statistical Methods	3

BME 433	Biomedical Engineering Applications of Statistics	3
CHEM 513	Statistics for Analytical Chemists	3
Interprofessional Projects (IPRO)		(6)
See Illinois Tech Core Curriculum, section E		6
Humanities and Social Science Requirements		(15)
See Illinois Tech Core Curriculum, sections B and C		15
Total Credit Hours		123-124

AI Requirement DS 151 fulfills the University Computer Science Requirement.

AI Requirements COM 200 and PHIL 372/380/381 are counted towards Humanities and Social Science Requirements.

Sample
Curriculum/Program
Requirements

Bachelor of Science in Biochemistry Curriculum

			Year 1
Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 100 or CHEM 100	2	BIOL 115	3
BIOL 107	3	BIOL 117	1
BIOL 109	1	CHEM 125	4
CHEM 124	4	MATH 123	3
MATH 151	5	MATH 152	5
	15		16
			Year 2
Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 214	3	CHEM 239	3
CHEM 237	4	CHEM 240	1
PHYS 123	4	PHYS 221	4
DS 151	3	CS 180	3
Social Sciences Elective	3	COM 200	3
	17		14
			Year 3
Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 301	3	BIOL 402	3
STAT 225	3	BIOL 404	3
Humanities Elective	3	CHEM 456	3
Social Sciences Elective	3	Technical Electives	3

Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 412	3	BIOL 451	2
CHEM 438	3	CHEM 485	1
BIOL 445	3	BUS 432	3
BIOL 495	1	PHIL 381	3
Humanities Elective	3	Upper Division Laboratory ¹	3
		Social Sciences Elective (300+)	3
	13		15

Total Credit Hours: 120

¹

[CHEM 321](#) or [CHEM 434](#) should be selected for the chemistry specialization. [CS 331](#) may be selected for the computation specialization.

Program Outcomes and Assessment Process

What are your learning objectives in this program? Please list each learning objective in the boxes below:

Note: These should be the same as described in your assessment plan at the bottom of this form.

Analyze and respond to biochemical questions by applying the core concepts of biochemistry.

Explain the role of evolution and homeostasis in shaping the form and function of all biological molecules and organisms.

Perform reproducible experiments in a biochemistry laboratory while maintaining accurate and complete records and adhering to high safety and ethical standards. Analyze and interpret quantitative data to address biochemical questions.

Search, evaluate, and synthesize primary literature and database resources related to biochemistry.

Clearly communicate about science in both oral and written forms.

Effectively collaborate in teams.

Pre-health: Students will demonstrate an understanding of the role and impact of biochemical systems in health and medicine.

Chemistry: Students will demonstrate the ability to apply quantitative analytical chemistry methods.

Computation: Students will demonstrate the ability to apply computational tools to the study of biochemical macromolecules and systems

Biophysics: Students will demonstrate an understanding of the physical basis of the structure and function of biochemical macromolecules and systems, and methods of studying this physical basis.

Upload your
assessment plan
here:

Undergraduate Program Requirements

What courses will
factor the major
GPA?

BIOL 105 - Introduction to Biology
 BIOL 100 - Introduction to the Profession
 BIOL 114 - Introduction to Human Biology
 BIOL 115 - Human Biology
 BIOL 214 - Genetics
 BIOL 402 - Metabolic Biochemistry
 BIOL 404 - Biochemistry Laboratory
 BIOL 445 - Cell Biology
 CHEM 100 - Introduction to the Profession
 CHEM 124 - Principles of Chemistry I with Laboratory
 CHEM 123 - General Chemistry Laboratory
 CHEM 126 - Principles of Chemistry II Without Laboratory
 CHEM 140 - Principles of Chemistry II Lab
 CHEM 125 - Principles of Chemistry II with Laboratory
 CHEM 122 - Principles of Chemistry I
 CHEM 235 - Organic Chemistry I
 CHEM 237 - Organic Chemistry I
 CHEM 236 - Organic Chemistry I-Lab
 CHEM 239 - Organic Chemistry II
 CHEM 240 - Organic Chemistry Laboratory
 CHEM 343 - Physical Chemistry I
 CHEM 344 - Physical Chemistry II
 CHEM 438 - Physical Biochemistry
 PHYS 410 - Molecular Biophysics
 BIOL 412 - Advanced Biochemistry
 CHEM 456 - Computational Biochemistry and Drug Design

BIOL 550 - Bioinformatics
 BIOL 107 - General Biology Lectures
 BIOL 109 - General Biology Laboratory
 BIOL 117 - Human Biology Laboratory
 BIOL 495 - Biology Colloquium
 CHEM 125 - Principles of Chemistry II with Laboratory
 CHEM 485 - Chemistry Colloquium
 BIOL 451 - Biological Literature
 CHEM 451 - Undergraduate Seminar
 BIOL 431 - Animal Physiology Laboratory
 BIOL 446 - Cell Biology Laboratory
 CHEM 416 - Advanced Chemistry Laboratory
 CHEM 434 - Spectroscopic Methods in Identification and Analysis
 CHEM 461 - Bioanalytical Chemistry Laboratory
 CHEM 463 - Analytical Method Development Laboratory
 CHEM 476 - Forensic Chemistry Laboratory
 PHYS 300 - Instrumentation Laboratory
 BIOL 401 - Introductory Biochemistry

Undergraduate Degree Requirements

Minimum credit hours 120

Specialization required?
Optional

Notes about specialization requirement

See above in specialization requirements. Students do not NEED to do a specialization, but can elect to do so by taking the specialization required classes, which can fit into a combination of the upper division lab, biochemistry technical electives, and free electives.

Minor required?
No

Proposed General Curriculum

Degree credit hours required

Specialization credit hour requirement 9

List Major Course
Requirements

See above

List Mathematics
Requirements

See above

List Science
Requirements

See above

List Computer
Science
Requirements

See above

List Humanities and
Social Sciences
Requirements

See above

List
Interprofessional
Project (IPRO)
Requirements

See above

List Technical
Elective Course
Options

See above

List Free Elective
Credit Hours (if
applicable)

Semester-by-
semester plan of
study for the
degree program

Specialization

To which degree does this specialization / concentration apply?

Title of Specialization / Concentration

Pre-Health

How many credit hours are required for this specialization / concentration?

9

Can credit hours be shared between specialization / concentration and major requirements?

Yes

Explain:

These courses may be taken for biochemistry technical electives.

List specialization/concentration courses, including any required choices from formal course groups. Please include the credit hour minimums for all course categories.

3 of BIO 210 225 305 327 410 440 470 475 FDSN 401 PSYC 414

To which degree does this specialization / concentration apply?

Title of Specialization / Concentration

Chemistry

How many credit hours are required for this specialization / concentration?

13

Can credit hours be shared between specialization / concentration and major requirements?

Yes

Explain:

These courses may be taken for the upper division lab and biochemistry technical electives

List specialization/concentration courses, including any required choices from formal course groups. Please include the credit hour minimums for all course categories.

CHEM 247, CHEM 321 or BIOL 455, CHEM 415, CHEM 434

To which degree does this specialization / concentration apply?

Title of Specialization / Concentration
Computation

How many credit hours are required for this specialization / concentration?

11

Can credit hours be shared between specialization / concentration and major requirements?

Yes

Explain:

these can fit into technical electives, and CS331 can count as the upper level lab elective

List specialization/concentration courses, including any required choices from formal course groups. Please include the credit hour minimums for all course categories.

CS 116 and 331, (CS 422 or 484), (MATH 240 or 251 or 252 or CS 330)

To which degree does this specialization / concentration apply?

Title of Specialization / Concentration
Biophysics

How many credit hours are required for this specialization / concentration?

9

Can credit hours be shared between specialization / concentration and major requirements?

Yes

Explain:

these can fit into TEs

List specialization/concentration courses, including any required choices from formal course groups. Please include the credit hour minimums for all course categories.

PHYS 223 or 224, PHYS 410, BIOL 455 or 555

Reviewer
Comments

Carly Kocurek (ckocurek) (03/13/26 2:33 pm): Rollback: Rolling this back because UGSC wants these entered a very specific way. Jennifer and I are going to try to enter this. Don't be alarmed.

Carly Kocurek (ckocurek) (03/16/26 9:31 am): Rollback: Please fix the credit hour total issue David identified.

Key: 695

