Date Submitted: 02/19/26 9:32 am

Viewing: BS-BCHM-4 : Bachelor of Science in Biochemistry

Last approved: 10/10/25 10:37 am

Last edit: 02/19/26 9:32 am

Changes proposed by: dminh

Catalog Pages Using this Program
Bachelor of Science in Biochemistry

Program Status	Active			
Requestor	Name	David Minh ~~Nicholas Menhart~~	E-mail	dminh@illinoistech.edu ~~menhart@iit.edu~~
Origination Date	2026-2-19 ~~2025-2-7~~			
Is this an interdisciplinary program?	Yes ~~No~~			
Is this stem-eligible?	Yes			
Available for direct application?	Yes			
Academic Unit	Administrative			
College	Administrative			

Contributing Academic Unit(s)

Academic Units
Chemical Sciences
Biological Sciences
Physics

In Workflow

1. AM Interdisciplinary Curriculum Committee Chair
2. Academic Affairs
3. Undergraduate Academic Affairs
4. AM Dean
5. Undergraduate Studies Committee Chair
6. Faculty Council Chair
7. Academic Affairs

Approval Path

1. 01/29/26 11:49 am Ayesha Qamer (aqamer): Rollback to Initiator
2. 02/05/26 3:21 pm Ayesha Qamer (aqamer): Rollback to Initiator

History

1. Oct 25, 2017 by clmig-jwehrheim
2. Nov 3, 2017 by Sarah Pariseau (sparisea)
3. Apr 27, 2018 by Sarah Pariseau (sparisea)
4. May 1, 2018 by Sarah Pariseau (sparisea)
5. May 1, 2018 by Sarah Pariseau (sparisea)

Program Title
Bachelor of Science in Biochemistry

Effective Academic Year	2026 ~~2025~~ - 2027 ~~2026~~	Effective Term	Summer 2026
Academic Level	Undergraduate		

6. Oct 23, 2020 by Holli Pryor-Harris (pryor)
7. May 7, 2024 by Nicholas Menhart (menhart)
8. Oct 10, 2025 by Nicholas Menhart (menhart)

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?

Program Type	Degree
Degree Type	Bachelor of Science (BS)

CIP Code
26.0202 - Biochemistry.

Program Code	BS-BCHM-4
Program Attribute	
Total Program Credit Hours	120

Please provide a summary and rationale for the requested program revision.

We are revising this program to:
* Prepare for American Society of Biochemistry and Molecular Biology (ASBMB) accreditation, to be first in Illinois. This could increase recruitment and yield.
* Retain American Chemical Society approval of the chemistry specialization.
* Increase the biochemistry focus of the program, which could increase yield and retention.
* Refine specializations, their learning objectives, and assessment.

~~*make it achievable in 120 ch, pursuant to the universities reduction in minimum ch forBS.this is expected to make the program more achievable and increase student success and graduation and retention rates *incorporate as specialization programs roughly equivalent to BS-MBB and BS-COMC isapproved.those programs will be eliminated once this program~~

~~isapproved.BS-COMC is currently onhiatus.*add new specialization in pre-health, advanced biochemistry, and chemistry to increase interdisciplinarity and engagement of relevant AUs, as well as provide enhanced student engagement and professional developmentNB:~~In ~~Last year,~~ AY2023, control of this program and BS-MBB and BS-COMC was passed to an interdisciplinary oversight committee with representatives form Biology, Chemistry and Physics, under the interdisciplinary programs policy. Steering committee has 2 reps from BIO, 2 reps form CHEM, and 1 form PHYS.

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 initative by a governmental entity, provide details of that initiative.

This ~~this~~ is an existing program. ~~incorporation of two small programs as specializations is in line with university initiatives to reduce the number of small enrollment programs, while also providing a pathway to recruit and serve students interested in these programs.TOTAL HEADS BCHM MBB COMC total 2021 26 2 0 28 2022 30 2 0 32 2023 29 3 3 35 2024 24 3 1 28 2025 24 3 1 28~~

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.

The revision was designed to achieve American Society of Biochemistry and Molecular Biology (ASBMB) accreditation, which would improve recruitment and yield efforts.

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.

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 ~~this~~ program revision was developed by he Biochemistry steering committee. ~~committee, in consultation with the biology, chemistry and physics departments~~

Admission Entry Details

What are the enrollment estimates?

Year 1	30	Year 2	35	Year 3	40

Attach Additional Program Justification Document(s): BS-BCHM- AM dean approval.pdf

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)**
BIOL 401	Introductory Biochemistry	3
BIOL 402	Metabolic Biochemistry	3
BIOL 404	Biochemistry Laboratory	3
BIOL 412	Advanced Biochemistry	3
CHEM 438	Physical Biochemistry	3
or PHYS 410	Molecular Biophysics	
CHEM 456	Computational Biochemistry and Drug Design	3
Biology Requirements		**(15)**
BIOL 107	General Biology Lectures	3
BIOL 109	General Biology Laboratory	1
BIOL 115	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 343~~	~~Physical Chemistry I~~	~~3~~
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		
Upper Division Laboratory		(3)	
~~Select 11 credit hours from >300 biology or chemistry or~~		~~11~~	
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	
BIOL 455	Macromolecular Techniques	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		(13)	13
Up to 7 credits of the following lower division courses will count towards this requirement			
BIOL 210	Microbiology	3	
BIOL 225	Microbiology Laboratory	2	
CHEM 247	Analytical Chemistry	0 OR 4	
CS 116	Object-Oriented Programming II	0 OR 2	
FDSN 201	Nutrition and Wellness	4	
MATH 230	Introduction to Discrete Math	3	
MATH 251	Multivariate and Vector Calculus	4	
MATH 252	Introduction to Differential Equations	4	
~~FDSN 401~~	~~Nutrition, Metabolism, and Health~~	~~3~~	
Any lower division course towards the certificate in AI fluency or AI management			

Select at least 6 credit hours from the following upper division courses		
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
~~Any 300+ level BIOL or CHEM course~~		~~3~~
Any 300+ level course towards the certificate in AI fluency or AI management		
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
Computer Science Requirement		**(2)**
Any CS core class		2
Interprofessional Projects (IPRO)		**(6)**
See Illinois Tech Core Curriculum, section E		6
Humanities and Social Science Requirements		**(21)**
See Illinois Tech Core Curriculum, sections B and C		21
Total Credit Hours		120-121

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 152	5
MATH 151	5	Humanities Elective	3
	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
~~MATH 251~~	~~4~~	Technical Electives	4
Computer Science Core	2	Humanities or Social Science Elective	3
Social Sciences Elective	3	~~CS core~~	~~2~~
	16		15

Year 3

Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 401	3	BIOL 402	3
~~CHEM 343~~	~~3~~	~~CHEM 438 or 344~~	~~3~~
~~CHEM 485~~	~~1~~	BIOL 404	3
~~Biochemistry Elective[2]~~	~~3~~	~~MATH 425~~	~~3~~
STAT 225	3	~~Biochemistry Elective[2]~~	~~3~~
Technical Elective	3	CHEM 456	3
Social Sciences Elective	3	Technical Electives	3
IPRO	3	IPRO	3
	15		15

Year 4

Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 412	3	BIOL 451	2
CHEM 438	3	~~BIOL 495~~	~~1~~
BIOL 445	3	~~Biochemistry Elective[2]~~	~~3~~
~~Biochemistry Elective[2]~~	~~2~~	CHEM 485	1

~~Biochemistry Lab Elective~~[1]	~~3~~	Upper Division Laboratory[1]	3
BIOL 495	1	Techical Elective	3
Humanities Elective	3	Social Sciences Elective (300+)	3
~~Humanities Elective (300+)~~	~~3~~	Humanities Elective (300+)	3
	13		15

Total Credit Hours: 120

1 CHEM 321, CHEM 434, or BIOL 455 should be selected for the chemistry specialization. CS 331 may be selected for the computation specialization. BIOL 455 or BIOL 555 should be selected for the biophysics specialization.

2 ~~Select from the following courses: BIOL 225, FDSN 401, MATH 252, PHYS 410, or any 300+ level BIOL or CHEM course.~~

Specialization Requirements

Specializations

~~1 Will satisfy the upper division lab requirement~~

Pre-Health		
Choose 3 courses from the below, with no more than one lower division course counting towards the specialization		9
BIOL 210	Microbiology	3
FDSN 201	Nutrition and Wellness	4
BIOL 327	Introduction to Immunology	3
BIOL 410	Medical Microbiology	3
BIOL 415	Advanced Human Genetics	3
BIOL 440	Neurobiology	3
BIOL 470	Systems and Behavioral Neuroscience	3
BIOL 475	Health and Disease in Modern Society	3
FDSN 300	Nutrition Through the Life Cycle	3
FDSN 401	Nutrition, Metabolism, and Health	3
~~PSYC 411~~	~~Medical Aspects of Disabling Conditions~~	~~3~~
PSYC 414	Neural and Biological Bases of Behavior	3
~~Advanced Biochemistry~~		~~13~~
Chemistry		13 OR 14
~~CHEM 247~~	~~Analytical Chemistry~~	~~3~~
CHEM 247	Analytical Chemistry	3

CHEM 321	Instrumental Analysis [1]	3 OR 4
or BIOL 455	Macromolecular Techniques	
CHEM 415	Inorganic Chemistry	3
~~CHEM 434~~	~~Spectroscopic Methods in Identification and Analysis~~	~~4~~
CHEM 434	Spectroscopic Methods in Identification and Analysis [1]	4
~~BIOL 512~~	~~Advanced Biochemistry~~	~~3~~
~~BIOL 455~~	~~Macromolecular Techniques~~ [1]	~~3~~
Computation		11 OR 12
CS 116	Object-Oriented Programming II	2
CS 331	Data Structures and Algorithms [1]	3
~~MATH 252~~	~~Introduction to Differential Equations~~	~~3 OR 4~~
~~or MATH 332~~	~~Elementary Linear Algebra~~	
~~CHEM 456~~	~~Computational Biochemistry and Drug Design~~	~~3~~
CS 422	Data Mining	3
or CS 484	Introduction to Machine Learning	
Select one of the following		3 or 4
CS 330	Discrete Structures	3
MATH 230	Introduction to Discrete Math	3
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4
Biophysics		9 or 10
PHYS 224	General Physics III for Engineers	3
or PHYS 223	General Physics III	
PHYS 304	Thermodynamics and Statistical Physics	3
PHYS 410	Molecular Biophysics	3
~~BIOL 455~~	~~Macromolecular Techniques~~ [1]	~~3~~

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.

~~Students will be able todemonstrate...~~Analyze ~~technical skills in a laboratory setting~~ and respond to ~~investigate~~ biochemical questions ~~experimentally~~ by applying the core concepts of biochemistry. ~~collecting, analyzing, and interpreting quantitative data.~~

Explain the role of evolution and homeostasis in shaping the form and function of all biological molecules and organisms. ~~" Students will be able to Analyze and respond to biochemical questions using foundational technical knowledge in relevant areas, namely:(a) metabolism; "~~

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. ~~" Students will be able to Analyze and respond to biochemical questions using foundational technical knowledge in relevant areas, namely:; (b) organic chemistry;."~~

Search, evaluate, and synthesize primary literature and database resources related to biochemistry. ~~" Students will be able to Analyze and respond to biochemical questions using foundational technical knowledge in relevant areas, namely:(c) thermodynamics and kinetics; "~~

Clearly communicate about science in both oral and written forms. ~~" Students will be able to Analyze and respond to biochemical questions using foundational technical knowledge in relevant areas, namely:(d) macromolecular structure;"~~

Effectively collaborate in teams. ~~" Students will be able to Analyze and respond to biochemical questions using foundational technical knowledge in relevant areas, namely:(e) spectroscopy; "~~

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 ~~be able~~ to apply computational tools ~~Analyze and respond~~ to the study of biochemical macromolecules and systems
Biophysics: ~~questions using foundational technical knowledge in relevant areas, namely:~~ 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. ~~(e) spectroscopy; "~~

~~Specialization LOs:1.Pre-health:Students will demonstrate an understanding of the role and impact of biochemical systems in health and medicine..2Advanced biochemistry Students will demonstrate an understanding of biochemical molecules and systems beyond that required for the non-specialized program 3.Chemistry Students will demonstrate the ability to apply quantitative analytical chemistry methods to biochemical systems.4.Computational biochem Students will demonstrate the ability to apply computational tools to the study of biochemical macromolecules and systems 5.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:

~~BS-BCHM Assessment Plan_revised 2024.xlsx~~

AssessmentPlan.pdf

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
BIOL 455 - Macromolecular Techniques
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 ~~see~~ above in specialization requirements. Students to 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

List Mathematics Requirements

List Science Requirements

List Computer Science Requirements

List Humanities and Social Sciences Requirements

List Interprofessional Project (IPRO) Requirements

List Technical Elective Course Options

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 ~~Prehealth~~

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. ~~these can fit into 3 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 ~~411~~ 414

To which degree does this specialization / concentration apply?

Title of Specialization / Concentration

~~Advanced biochemistry~~

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

~~9~~

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

~~Yes~~

Explain:

~~they 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.

~~CHEM 247 and 434, BIO 512 (will be crosslisted in the future)~~

To which degree does this specialization / concentration apply?

Title of Specialization / Concentration

Chemistry

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

13 ~~9~~

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 ~~247~~ 434 ~~415~~

To which degree does this specialization / concentration apply?

Title of Specialization / Concentration

Computation ~~Computational Biochemistry~~

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) ~~or 333), CHEM 465~~

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 ~~MATH 252, PHYS 224 and 410~~

Reviewer Comments

Ayesha Qamer (aqamer) (01/29/26 11:49 am): Rollback: roll back requested

Ayesha Qamer (aqamer) (02/05/26 3:21 pm): Rollback: Please revise the sample curriculum as BIOL 301 does not exist.

David Minh (dminh) (02/19/26 9:36 am): I made a mistake by removing this footnote from specializations: 1 Will satisfy the upper division lab requirement

Key: 33