Date Submitted: 03/27/26 4:34 pm

Viewing: BS-CHE : Bachelor of Science in Chemical Engineering

Last approved: 03/12/26 5:39 pm

Last edit: 03/27/26 4:33 pm

Changes proposed by: person

Catalog Pages Using this Program	Bachelor of Science in Chemical Engineering

Program Status	Active			
Requestor	Name	Beatrice Person ~~Ayesha Qamer~~	E-mail	~~aqamer@iit.edu~~
Origination Date	2026-3-27 ~~2026-3-12~~			
Is this an interdisciplinary program?	No			
Is this an incubator program?	No			
Is this stem-eligible?	Yes			
Available for direct application?	Yes			
Academic Unit	Chemical Biological Engrg		College	Armour College of Engineering
Program Title	Bachelor of Science in Chemical Engineering			
Effective Academic Year	2026 ~~2021~~ - 2027 ~~2022~~	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?	
Program Type	Degree
Degree Type	Bachelor of Science (BS)
CIP Code	14.0701 - Chemical Engineering.
Is there more than one Academic Unit proposer?	No
Program Code	BS-CHE
Program Attribute	
Total Program Credit Hours	132
Please provide a summary and rationale for the requested program revision.	Added F. Teymour as co-Program Advisor with J. Schieber under the Professional Specialization for Polymer Science and Engineering. This change was approved by chair and faculty, and should have been added last year. 3/27/2026 Victor Perez-Luna is requesting the following changes to the to Bachelor Science

In Workflow

1. CHBE Chair
2. Academic Affairs
3. Undergraduate Academic Affairs
4. AC Dean
5. Undergraduate Studies Committee Chair
6. Faculty Council Chair
7. Academic Affairs

History

1. Oct 18, 2017 by clmig-jwehrheim
2. Nov 8, 2017 by Sarah Pariseau (sparisea)
3. Apr 2, 2018 by Sarah Pariseau (sparisea)
4. Apr 3, 2019 by Sarah Pariseau (sparisea)
5. Apr 12, 2019 by Beatrice Person (person)
6. Apr 12, 2019 by Sarah Pariseau (sparisea)
7. Jun 10, 2021 by Beatrice Person (person)
8. Mar 12, 2026 by Ayesha Qamer (aqamer)

degree in Chemical Engineering program for the Bioengineering Specialization that offers two options, Bioengineering and Biomedical Engineering.

Reason: Consolidate the specialization into one Bioengineering Specialization and eliminate the Biomedical Engineering option because this specialization was created before the BME Department was created at Illinois Tech.

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.

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.

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.

Admission Entry Details

What are the enrollment estimates?

Year 1 Year 2 Year 3

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?

Program Resources

Which program resources are necessary to offer this program?

Proposed Catalog Entry

Admission Requirements

Course Requirements

Required Courses

Chemical Engineering Requirements		**(47)**
CHE 100	Introduction to the Profession I	2
CHE 101	Introduction to the Profession II	2
CHE 202	Material Energy Balances	3
CHE 239	Mathematical and Computational Methods	3
CHE 301	Fluid Mechanics	3
CHE 302	Heat and Mass Transfer Operations	3
CHE 311	Foundations of Biological Science for Engineering	3
CHE 317	Chemical and Biological Engineering Laboratory I	2
CHE 351	Thermodynamics I	3
CHE 406	Transport Phenomena	3
CHE 418	Chemical and Biological Engineering Laboratory II	2
CHE 423	Chemical Reaction Engineering	3
CHE 433	Process Modeling and System Theory	3
CHE 435	Process Control	3
CHE 451	Thermodynamics II	3
CHE 494	Process Design I	3
CHE 496	Process Design II	3
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
Chemistry Requirements		**(18)**
CHEM 125	Principles of Chemistry II with Laboratory [1]	4
CHEM 237	Organic Chemistry I	4
CHEM 239	Organic Chemistry II	3
CHEM 343	Physical Chemistry I	3
CHEM 344	Physical Chemistry II	4
or BIOL 403	Biochemistry	
Computer Science Requirement		**(2)**
CS 104	Introduction to Computer Programming for Engineers	2
or CS 105	Introduction to Computer Programming	
Electrical and Computer Engineering Requirement		**(3-4)**
ECE 211	Circuit Analysis I	3-4
or ECE 218	Digital Systems	
Technical Electives		**(9)**
Select nine credit hours [2]		9
Humanities and Social Science Requirements		**(21)**
See Illinois Tech Core Curriculum, sections B and C		21

Interprofessional Projects (IPRO)	(6)
See Illinois Tech Core Curriculum, section E	6
Total Credit Hours	132-133

1 Initial placement in CHEM 125 requires consent of the chemistry department.
2 One technical elective must be CHE 426 or an engineering science elective (CHE 400+ level).

Sample Curriculum/Program Requirements

Bachelor of Science in Chemical Engineering Curriculum

			Year 1
Semester 1	Credit Hours	Semester 2	Credit Hours
CHE 100	2	CHE 101	2
MATH 151	5	MATH 152	5
CHEM 125[1]	4	PHYS 123	4
CS 104 or 105	2	Social Sciences Elective	3
Humanities 200-level Course	3	Humanities or Social Sciences Elective	3
	16		17
			Year 2
Semester 1	Credit Hours	Semester 2	Credit Hours
CHE 202	3	CHE 239	3
MATH 252	4	CHE 301	3
CHEM 237	4	MATH 251	4
PHYS 221	4	CHEM 239	3
Humanities Elective (300+)	3	CHEM 343	3
	18		16
			Year 3
Semester 1	Credit Hours	Semester 2	Credit Hours
CHE 302	3	CHE 317	2
CHE 311	3	CHE 433	3
CHE 351	3	CHE 451	3
ECE 211 or 218	3-4	CHEM 344 or BIOL 403	4
Humanities Elective (300+)	3	IPRO Elective I	3
		Technical Elective[2]	3
	15-16		18
			Year 4
Semester 1	Credit Hours	Semester 2	Credit Hours
CHE 418	2	CHE 406	3
CHE 423	3	CHE 496	3
CHE 435	3	IPRO Elective II	3
CHE 494	3	Technical Elective[2]	3
Technical Elective[2]	3	Social Sciences Elective (300+)	3
Social Sciences Elective (300+)	3		
	17		15

Total Credit Hours: 132-133

1 Initial placement in CHEM 125 requires the consent of the chemistry department.
2 One technical elective must be CHE 426 or an engineering science elective (CHE 400+ level).

Specialization Requirements

Professional Specializations

Students choosing one of the professional specializations should take a total of three courses in the specialization area. Appropriate substitutions may be made with the approval of the program adviser.

Bioengineering

Program advisers: S. Parulekar and V. Pérez-Luna

~~Biomedical Engineering~~

~~BIOL 107~~	~~General Biology Lectures~~	~~3~~

~~BIOL 115~~	~~Human Biology~~	~~3~~
~~Select one elective from the following:~~		~~3~~
~~BIOL 214~~	~~Genetics~~	~~3~~
~~or BIOL 414~~	~~Genetics for Engineering Scientists~~	
~~BIOL 301~~	~~Introductory Biochemistry~~	~~3~~
~~BIOL 430~~	~~Human Physiology~~	~~3~~
~~BIOL 445~~	~~Cell Biology~~	~~3~~
~~CHE 491~~	~~Undergraduate Research~~	~~1-6~~
~~CHE 577~~	~~Bioprocess Engineering~~	~~3~~

~~Biotechnology~~

~~Select three electives from the following:~~		~~9~~
~~BIOL 107~~	~~General Biology Lectures~~	~~3~~
~~BIOL 214~~	~~Genetics~~	~~3~~
~~or BIOL 414~~	~~Genetics for Engineering Scientists~~	
~~BIOL 445~~	~~Cell Biology~~	~~3~~
~~BIOL 301~~	~~Introductory Biochemistry~~	~~3~~
~~CHE 577~~	~~Bioprocess Engineering~~	~~3~~
Select 9 credit hours from the following courses:		9
BIOL 115	Human Biology	3
BIOL 210	Microbiology	3
BIOL 414	Genetics for Engineering Scientists	3
BIOL 430	Human Physiology	3
BIOL 445	Cell Biology	3
BIOL 475	Health and Disease in Modern Society	3
BME 310	Biomaterials	3
BME 433	Biomedical Engineering Applications of Statistics [1]	3
CHE 416	Technologies for Treatment of Diabetes	3
CHE 424	Quantitative Aspects of Cell and Tissue Engineering	3
CHE 426	Statistical Tools for Engineers [1]	3
CHE 514	Process Analytical Technology	3
CHE 577	Bioprocess Engineering	3
CHE 583	Pharmaceutical Engineering	3
CHE 585	Drug Delivery	3
Undergraduate or Graduate research credits can count towards the specialization as long as the research is related to bioengineering.		1-6

1 Students can only take either ChE 426 or BME 433 as an elective.

~~Bioengineering has two careerspecializations:~~Energy/Environment/Economics (E3)

Program adviser: H. Arastoopour

CHE 543	Energy, Environment, and Economics	3
Energy Sources, Conversion, Utilization, and Distribution		(3)
Select at least one course from the following:		3
CHE 465	Electrochemical Energy Conversion	3
CHE 467	Fuel Cell System Design	3
CHE 489	Fluidization	3
CHE 491	Undergraduate Research	1-6
CHE 541	Renewable Energy Technologies	3
CHE 542	Fluidization and Gas-Solids Flow Systems	3

CHE 565	Fundamentals of Electrochemistry	3
CHE 567	Fuel Cell Fundamentals	3
CHE 582	Interfacial and Colloidal Phenomena with Applications	3
ECE 319	Fundamentals of Power Engineering	4
ECE 411	Power Electronics	4
ECE 419	Power Systems Analysis with Laboratory	4
ECE 420	Analytical Methods for Power System Economics and Cybersecurity	3
ECE 438	Control Systems	3
MMAE 425	Direct Energy Conversion	3
MMAE 426	Nuclear, Fossil-Fuel, and Sustainable Energy Systems	3
MMAE 524	Fundamentals of Combustion	3
MMAE 525	Fundamentals of Heat Transfer	3
Energy and Environment, System Analysis, and Special Problems		**(3)**
Select at least one course from the following:		3
CHE 426	Statistical Tools for Engineers	3
ECE 491	Undergraduate Research	1-3
ECON 423	Economics of Capital Investments	3
ENVE 404	Water and Wastewater Engineering	3
ENVE 463	Introduction to Air Pollution Control	3
ENVE 485	Industrial Ecology	3
IPRO 497	Interprofessional (IPRO) Project	3
MMAE 491	Undergraduate Research	1-6
MMAE 494	Undergraduate Design Project	1-3
MMAE 497	Undergraduate Special Topics	1-6
PS 338	Energy Policy	3

Environmental Engineering

Program adviser: B. Stephens

Environmental Engineering		**(3)**
Select at least one course from the following:		3
CHE 426	Statistical Tools for Engineers	3
ENVE 404	Water and Wastewater Engineering	3
ENVE 463	Introduction to Air Pollution Control	3
ENVE 485	Industrial Ecology	3
Civil Engineering		**(3)**
Select at least one course from the following:		3
CAE 421	Risk Assessment Engineering	3
CAE 482	Hydraulic Design of Open Channel Systems	3
IPRO 497	Interprofessional (IPRO) Project	3

Polymer Science and Engineering

Program advisers: J. Schieber and F. Teymour

The program embraces polymer chemistry, characterization, structure and properties, as well as the manufacture of polymeric raw materials and their processing into finished products.

Select one course from the following:		3
CHE 470	Introduction to Polymer Science	3
CHEM 470	Introduction to Polymers	3
MMAE 470	Introduction to Polymer Science	3

Select at least one course from the following:		3
CHE 538	Polymerization Reaction Engineering	3
CHE 555	Polymer Processing	3
CHE 575	Polymer Rheology	3
CHEM 535	Polymer Synthesis	3
CHEM 537	Polymer Chemistry Laboratory	3
CHEM 542	Polymer Characterization and Analysis	3
MMAE 579	Advanced Materials Processing	3
Students may take up to one of the following courses:		3
CHE 426	Statistical Tools for Engineers	3
CHE 489	Fluidization	3
CHE 491	Undergraduate Research	1-6
CHE 582	Interfacial and Colloidal Phenomena with Applications	3
MMAE 451	Finite Element Methods in Engineering	3
MMAE 485	Manufacturing Processes	3

Process Design and Operation

Program adviser: D. Chmielewski

For students interested in design, operation, monitoring, optimization, and control of chemical processes.

Select at least one course from the following:		3
CHE 426	Statistical Tools for Engineers	3
CHE 508	Process Design Optimization	3
CHE 530	Advanced Process Control	3
CHE 560	Statistical Quality and Process Control	3
Select at least one course from the following: [1]		3
CHE 465	Electrochemical Energy Conversion	3
CHE 489	Fluidization	3
CHE 491	Undergraduate Research	1-6
ENVE 463	Introduction to Air Pollution Control	3
ENVE 476	Engineering Control of Industrial Hazards	3
ENVE 485	Industrial Ecology	3
ENVE 578	Physical and Chemical Processes for Industrial Gas Cleaning	3
ENVE 580	Hazardous Waste Engineering	3

[1] Only one course selection may be an ENVE course.

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.