

Department of Chemical and Biomolecular Engineering

Chemical Engineering Undergraduate Handbook

2019-2020

Department of Chemical and Biomolecular Engineering

<http://chbe.illinois.edu>

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Preface

Dear Handbook readers,

Thank you for your interest in the Department of Chemical and Biomolecular Engineering at the University of the Illinois at Urbana-Champaign. This Undergraduate Student Handbook is designed as a comprehensive reference guide to help students navigate through the program. It is filled with important information about the department's educational objectives, curriculum, advising and resources, as well as information about the undergraduate experience that will help students make the most of their time at the University of Illinois and prepare for their bright futures.

The Department of Chemical and Biomolecular Engineering at the University of the Illinois at Urbana-Champaign has a long record of academic excellence in undergraduate education and we are proud of our commitment to student success. This Handbook is the newest addition to the department's many resources for its undergraduate students. It will be updated yearly with the most current information available. We hope the Handbook proves to be a useful guide during your undergraduate education with us. If you have any questions with regard to the material contained within this document, or more broadly the CHBE program at UIUC, do not hesitate to send them my way.

I wish you the best in your studies here at the University of Illinois at Urbana-Champaign.

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1 INTRODUCTION

1.1 PROGRAM OVERVIEW

1.1.1 Department Mission Statement

We have designed our undergraduate educational program with the goal of educating leaders who will have a **deep understanding of engineering fundamentals and are able to apply this knowledge to management of complex systems with particular attention to the chemical process and product industries**. We believe that our students will be best served by our program providing them with a foundation on which to build careers through life-long learning and by teaching students how to learn. This foundation is, therefore, based on the key concepts of engineering while providing the students with the training to rapidly apply their knowledge to solve problems and develop relevant solutions.

1.1.2 Program Educational Objectives

Program educational objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve within a few years of graduation. University of Illinois Chemical and Biomolecular Engineering graduates will:

1. Obtain positions in industry, government or pursue advanced degrees.
2. Work in team environments to solve problems and effectively communicate results.
3. Lead projects in industry, government, or academia.
4. Improve their technical background and expertise through further training and/or formal education.

Our educational program objectives are designed to serve the needs of a diverse set of stakeholders (constituencies) including students, faculty, alumni, and employers.

1.1.3 Student Outcomes

Student outcomes are statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge and behaviors that students acquire in their matriculation through the program.¹

Our program educational objectives are based on the concept that the educational experience in our department should integrate the knowledge and skills acquired in a rigorous set of courses where the graduates of the program will gain:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

1.1.4 Enrollment Numbers

	2018-19	2017-18	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11
Undergraduate Enrollment	653	688	699	681	706	668	549	540	514
Graduate Enrollment	103	101	108	110	92	100	107	104	108
B.S. Degrees Earned	148	194	161	123	159	120	97	105	110

1.1.5 Department Communication

Illinois Compass 2g is an online learning management system most commonly used as course websites. The department hosts a compass 2G space for all CHBE undergraduate students called *OPEN LEARNING – Chemical Engineering Undergraduates*. This is where the department posts professional opportunities which are sent to us. These range from volunteer events to internships and co-ops to research opportunities for undergraduates (REUs). If you do not see the OPEN LEARNING space within your compass courses <https://compass2g.illinois.edu> send Dr. Higdon (jhigdon@illinois.edu) an email and you will be added.

1.2 OVERVIEW OF THE DEPARTMENT

The Department of Chemical and Biomolecular Engineering at Illinois is proud of its long tradition of academic excellence. In 1901 Samuel Parr opened the doors as the division of Applied Chemistry within the department of Chemistry. Sixty-seven years later, in 1968, the department became independent as Chemical Engineering.

One of the oldest chemical engineering programs in the nation, the department is housed within the School of Chemical Sciences and is part of the college of Liberal Arts and Sciences. The undergraduate program continues to be ranked as one of the top programs in the nation and has been accredited continuously since 1933, most recently in 2013 by the Engineering Accreditation Commission of ABET.

The department's name was changed in 2002 to Chemical and Biomolecular Engineering or ChBE to reflect the growing influence of biological and genetic research in chemical engineering research, education, and chemical engineering practice.

We are often asked why Chemical Engineering is part of Liberal Arts and Sciences rather than the College of Engineering. Chemical Engineering grew out of Chemistry as an applied science. The department maintains close ties with the College of Engineering. Students and faculty use the resources and programs of both colleges to their benefit.

1.3 CHEMICAL ENGINEERING STAFF

The Chemical Engineering Department has an outstanding set of 20 faculty members. The faculty directory can be found here: <http://chbe.illinois.edu/directory>

1.3.1 Faculty

Faculty members teach both graduate and undergraduate courses. Several of the faculty have won awards for excellence in undergraduate teaching. The faculty also conduct state-of-the-art research programs and publish many research papers. All have received national and international awards for their work and have held offices in national and international engineering societies.

Some current areas of research activity include nanotechnology, biomolecular engineering, biotechnology, tissue engineering, microreactors, fluid dynamics, transport phenomena, colloid and interfacial science, optimization and design, applied mathematics, electrochemical engineering, polymer science and engineering, kinetics and catalysis, and semiconductors. Each year several undergraduates get involved in these research activities by participating in our senior thesis program or other independent study courses, or by obtaining part-time employment in our research labs.

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1.4 MORE ABOUT CHEMICAL ENGINEERING

1.4.1 Chemistry vs. Chemical Engineering

We are often asked “What is the difference between chemistry and chemical engineering?” If you look at the chemical engineering curriculum at UIUC, you’ll see a lot of chemistry, 29 of the 129 credits for degree are specific chemistry courses. Chemical engineering started at Illinois as a specialized type of chemistry degree in the early 20th century. The independent Chemical Engineering program was first accredited in 1936, and chemical engineering has continued to evolve since. Chemical engineering is a unique degree which applies chemical principles, often but not limited to large scale. Chemical engineering often has little to do with the traditional definition of “chemistry” and much more to do with “engineering.”

Chemists can find themselves synthesizing new molecules or mixtures on the size scale of beakers. Chemical engineers often work to scale up the synthesis process and maintain existing scaled up processes. Chemical engineers work with reactors as large as and larger than a room.

If you are a prospective student still having a hard time deciding between these two majors at UIUC, it is best to apply directly to Chemical Engineering.

1.4.2 So What Exactly is Chemical Engineering?

An undergraduate degree in chemical engineering is excellent training for careers in various fields; from fuels and chemicals to consumer goods and foods. The uniquely diverse degree allows chemical engineers to apply science and mathematics to various problems. While many chemical engineers start their careers in a production role, mass producing foods, consumer goods, chemicals, or foods, they can easily transition to research and development, consulting, or return to graduate or professional schooling. A BS in chemical engineering is a great degree for pursuing graduate or professional school in nearly any area. It might be best to see a short history of the discipline in order to see where we came from and where we are headed.

The roots of chemical engineering are in two main places, the older being **chemistry**. Chemical engineering lies in the application of chemical principles to solve problems. Chemical manufacturing began as early as 7000 BC with the fermentation of rice, honey, and fruit beverages to produce ethanol. Around 4000 BC we were smelting copper, firing bricks, and making glass. By 3000 BC humans were using coal as a fuel and bitumen as a waterproofer and road paver. Around 2000 BC oil was being used as a fuel and around 1000 BC natural gas began to be used as a fuel. In ~50 AD the first use of simple distillation was developed to separate ethanol from water for use as a solvent and an antiseptic. This was the real start to the field of chemical engineering. It wasn’t for another 1000 years (~1250 AD) that simple distillation was improved to the more efficient fractional distillation, more similar to today’s unit operations. Chemical manufacture continued to grow with the industrial revolution. In 1684 John Winthrop Jr. opened America’s first chemical manufacturing facility to make saltpeter, used in the manufacture of gunpowder and alum, used in leather tanning. This scale was small in comparison to what is achieved today. In the 1700’s sulfuric acid was first produced in mass and is most commonly considered the first mass manufactured chemical. This mass chemical production is the start to the second main root of chemical engineering, **mechanical engineering**. In order to mass produce chemicals, machinery is required. In the beginning days of mass chemical production, chemists and machinists combined knowledge in order to get the job done. As the global population continued to increase, so did

the demand for mass production of chemicals. The field as a whole gained specific direction just before 1900 when many schools started to offer chemical engineering courses and specializations. The University of Illinois started the Chemical Engineering program within the Chemistry Department in 1901 as a specialized type of applied chemistry degree. The American Society of Chemical Engineers (AIChE) was founded in 1908 to give further direction to the field. Chemical engineering in the 1900's rapidly diversified from commodity chemical production to include fuels, plastics, foods, and consumer products. In 2002, to mark the increased role biology plays in product manufacturing, our department was one of the first to change name to Chemical and *Biomolecular* Engineering. Our chemical engineering graduates learn a background in these technologies and more to prepare them for very diverse starting careers, working for both large and small companies, in technologies from oil and gas to foods and consumer products to environmental consultation and to graduate and professional school. Students attending graduate and professional schools will earn PhDs in Chemical Engineering and other STEM fields or pursue degrees for medical doctors, lawyers, business, and many more.

1.4.3 A day in the life of a Chemical Engineer

Plant Engineer, Run Engineer, Production Engineer, Site Engineer, and similar positions. An example: My first position after earning my BS is a Run Plant Engineer at a mid-sized chemical manufacturing facility. It is my job to make sure the chemical production site is running. When it isn't running, that is my problem. I arrive at work by 6:45am. I look at the run report from the previous night (or over the weekend). Remember, a chemical plant runs 24 hours a day, 7 days a week, 365 days a year. There is very minimal downtime. At 7:30am I have a meeting with engineering operations, electrical, mechanical, utility, and maintenance. We prioritize process upsets, fixes to equipment, then scheduled maintenance. After the meeting I coordinate what needs to be done for any jobs, from immediately troubleshooting a problem to locking equipment out for regular maintenance.

Once I've completed those tasks, I work on longer term projects. This could be analyzing trends in process conditions in order to make the process just a bit more efficient. It could be planning the install of new piping, or a new reactor or any other capital project. At the end of the day, I make sure that everything is OK for running overnight or over the weekend.

I'm very satisfied with my career to this point. I am always learning something new. In a plant that was built 60 years ago, there are lots of improvements to make and equipment breaking. This makes day to day operations different despite seeming very similar.

Graduate student in Chemical Engineering. An example: I am in my third year of graduate school studying lipid membranes. I decided to attend graduate school because I liked research as an undergraduate and eventually want to be a professor. During my first year of graduate school, I took a full load of graduate level courses. Now I typically take 1 course a semester that is interesting or is useful for my research. I have been a graduate TA for 2 courses and have one more to complete my program requirements. As a TA I administered a discussion section once per week, graded homework, quizzes, and exams. I gave guest lectures in the course when the instructor was out of town. When I'm not in class or being a TA I work on my research. I typically spend 30-40 hours on research every week. My research involves creating a model lipid membrane on a Langmuir trough. This model approximates cell membranes in your skin. I then look at how disruptive soluble surfactants (soaps) are to this model. We hypothesize that the more disruption to model cell membranes will translate to more disruption in actual cell membranes leading to more skin irritation. Companies that make products applied to skin,

shampoo, body wash, lotions, sunscreen, makeup, etc., are interested in this technique because they are able to screen potential new ingredients in products for skin irritation without using expensive animal models.

2 CURRICULUM

2.1 GRADUATION REQUIREMENTS

Graduation requirements are based on your matriculation year, the year you start college. All Programs of Study are located on the Provost website at <http://provost.illinois.edu/ProgramsOfStudy/>. Chemical Engineering is found under LAS Specialized Curricula. The CHBE coursework related graduation requirements have not changed after Fall 2011.

Completion of at least 129 semester hours of credit are required for graduation. Specific degree requirements according to the Program of Study are summarized and outlined below. The outline is presented for the Concentration in Chemical Engineering. The Concentration in Biomolecular Engineering further restricts these requirements to a specific subset of courses and are noted. Specific courses in each of these categories are listed in the checklist below.

Course Number and Name	Credits	Course Number and Name	Credits
CHEM 202: Accelerated Chemistry I ²	3	ENG 100: Engineering Orientation ¹	0
CHEM 203: Accelerated Chemistry Lab I	2	CHBE 121: CHBE Profession ¹	1
CHEM 204: Accelerated Chemistry II	3	CHBE 221: Principles of CHE	3
CHEM 205: Accelerated Chemistry Lab II	2	CHBE 321: Thermodynamics	4
CHEM 236: Fundamental Organic Chem I	4	CHBE 421: Momentum and Heat Transfer	4
CHEM 237: Structure and Synthesis	2	CHBE 422: Mass Transfer Operations	4
CHEM 315: Instrumental Chem Systems Lab ⁶	2	CHBE 424: Chemical Reaction Engineering	3
CHEM 420: Instrumental Characterization	2	CHBE 430: Unit Operations Laboratory ⁵	4
CHEM 436: Fundamental Organic Chem II ⁷	3	CHBE 431: Process Design ⁵	4
CHEM 442: Physical Chemistry I	4	CHBE 440: Process Control and Dynamics	3
MATH 221: Calculus I ³	4	IE 300: Analysis of Data ⁹	3
MATH 231: Calculus II	3	Concentration ChemE Technical Electives	
MATH 241: Calculus III	4	400+ level CHBE courses ^{10, 11}	6
MATH 285: Intro Differential Equations ⁴	3	400+ level course from List 1 ^{10, 11}	3
MATH 415: Applied Linear Algebra	3	Any course from List 1 ¹¹	6
PHYS 211: University Physics: Mechanics	4	Technical Elective (400+, list 2)	4
PHYS 212: University Physics: Elec & Mag	4	Concentration BiomolE Technical Electives	
PHYS 214: University Physics: Quantum Physics	2	CHBE courses from Category A ^{12, 13}	9
CS 101: Intro to Computing: Engrg & Sci ⁸	3	Courses from Category B ¹³	6
RHET 105: Principles of Composition	4	Technical Elective (400+, list 2) ¹³	4
Electives in social sciences and humanities satisfying the campus general education requirements for social sciences and humanities, including cultural studies western and non-western components.	16		

1. For students entering the curriculum after the freshman year, 1 additional hr of credit from the list of approved engineering technical electives (List 1) may be substituted in place of CHBE 121. [Transfer students pursuing the Concentration in Biomolecular Engineering may substitute the 1 additional credit hour from Category A] ENG 100 is waived for students entering the curriculum after freshmen year.
2. Students who do not place into CHEM 202, or who do not satisfy the mathematics prerequisite for CHEM 202, may substitute the sequence CHEM 102, 103, 104, 105, 222, and 223 for CHEM 202, 203, 204, and 205.
3. MATH 220—Calculus may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.
4. MATH 441 may be substituted for MATH 285. MATH 286 (4 hours) may be substituted for MATH 285 (3 hours).
5. Advanced composition requirement is satisfied by completing the sequence CHBE 430 and CHBE 431.
6. Students must register in one of the Chemical Engineering-specific CHEM 315 lab sections.
7. MCB 450: Introductory Biochemistry may be substituted for CHEM 436. [Students pursuing the Concentration in Biomolecular Engineering must choose MCB 450.]
8. If a student takes CS 357 or CS 450 to satisfy a Technical Elective from List 2, he/she may substitute CS 125 for CS 101. The 1 additional credit hour of CS 125 is not applied toward any degree requirements. The substitution is only approved upon successful completion of CS 357 or CS 450.
9. If a student takes STAT 400 to fulfill 4 hr of 400 level Technical Elective from List 2, he/she may choose any 3 hr 300 or 400 level Technical elective from List 1 in place of IE 300. Under this option, the total number of hrs for graduation does not change, however students must take all additional tech elective hrs from courses on List 1.
10. No more than 3 hours being CHBE 497 or 499.
11. A maximum of 10 total hours of undergraduate research may be counted toward Technical Elective credit.
12. A maximum of 3 hours from this Category may be undergraduate research credit.
13. A maximum of 9 total hours of undergraduate research may be counted toward Technical Elective credit.

Transferrable courses from other institutions. Make sure your courses transfer to Illinois by visiting: <https://www.transferology.com>

2.1.1 Biomolecular Engineering Minor

This minor is not open to students majoring in chemical engineering. Those students should instead explore the biomolecular engineering concentration if they are interested in biomolecular engineering coursework. For more information about the Biomolecular Engineering minor, contact the [School of Chemical Sciences Academic Advisor](mailto:scs-advising@illinois.edu) scs-advising@illinois.edu.

2.2 COURSES

2.2.1 Departmental Course Offerings

Courses are offered in the following schedule:

Required courses:

CHBE 121: CHBE Profession (1 credit)	SP
CHBE 221: Principles of CHE (3 credit)	SP/FA
CHBE 321: Thermodynamics (4 credit)	SP/FA
CHBE 422: Mass Transfer Operations (4 credit)	SP/FA
CHBE 424: Chemical Reaction Engineering (3 credit)	SP/FA
CHBE 430: Unit Operations Laboratory (4 credit)	SP/FA (restricted to CHBE Sr.)
CHBE 431: Process Design (4 credit)	SP/FA (restricted to CHBE Sr.)
CHBE 440: Process Control and Dynamics (3 credit)	SP/FA (restricted to CHBE Sr.)

Recent elective offerings:

CHBE 451: Transport Phenomena (3 credit)
CHBE 452: Chemical Kinetics & Catalysis (3 credit)
CHBE 453: Electrochemical Engineering (3 credit)
CHBE 455: Polymers Synthesis & Industrial Applications (3 credit)
CHBE 456: Polymer Science & Engineering (3 credit)
CHBE 457: Microelectronics Processing (3 credit)
CHBE 471: Biochemical Engineering (3 credit)
CHBE 472: Techniques in Biomolecular Eng (3 credit)
CHBE 473: Biomolecular Engineering (3 credit)
CHBE 474: Metabolic Engineering (3 credit)
CHBE 475: Tissue Engineering (3 credit)
CHBE 476: Biotransport (3 credit)
CHBE 478: Bioenergy Technology (3 credit)
CHBE 494: Special Topics (3 credit) – a sample of recent offerings: Computational Tools, Nanostructures and Nanomaterials, Electrochemical Systems and Energy Technology

2.2.2 Group Work and Design Experience

Engineers must be effective in working within teams as well as solving open problems. The program curriculum has many opportunities for you to develop these skills.

Integrated, open-ended design projects are included in almost every required core Chemical Engineering course. In ENG 100, you are introduced to chemical engineering and thinking in terms of a process. Within CHBE 121, you focus your design on a chemical process accident and what must be done to make similar future designs safer. Your technical courses, CHBE 221, 321, 421, 424, will apply concepts learned within the lecture component of the courses to the design. Depending on upper classmen interest, you may have a mentor within CHBE 221 or 321. These design projects will typically be completed in groups of 3 or 4 and typically be worth 10% of your final course grade. Deliverables (assignments) range from poster sessions, presentations, and final reports.

CHBE 430 Unit Operations is highly group focused with approximately 70% of your course grade based on team performance and team evaluation. During the course you will work on three experiments in three different groups, 3-4 members, ranging from ethanol/water distillation to bioreactor fermentation to pumping and piping. Deliverables for each experiment include a written report and also include an oral component, presentation, poster session or other.

CHBE 431 Chemical Process Design is your capstone course and highly group focused with 50% your course grade determined by team performance and evaluation. You will work on a single design project with a group of 4 or 5 peers, typically designing a process to manufacture a commodity chemical. Your final deliverables will include a written report and an oral presentation and defense of the design.

2.2.3 Earning College Credit Outside of Courses Taken at UIUC

College credit may be earned outside of courses taken at UIUC. A list of the more common methods of earning credit other than UIUC courses are here <http://admissions.illinois.edu/Apply/Freshman/college-credit>. The department encourages exploring these avenues.

2.2.3.1 *Advanced Placement Credit*

Many students enter UIUC with college credit from AP Exams. Credit from AP Exams is very helpful for fulfilling general education requirements or starting at a higher level in math and science courses. The courses discussed here are of particular interest to Chemical Engineering students and for a full list you can go to <http://admissions.illinois.edu/Apply/Freshman/college-credit-AP>.

AP Biology: Biology is not a degree requirement. College credit earned via the AP Biology exam will not count toward your degree. Instead it is used in determining your class rank, which in turn determines your course scheduling window.

AP Chemistry: Advanced general chemistry (CHEM 200 series) is required for the degree. Earning a 3 or higher on the AP Chemistry test will give you partial credit for the standard general chemistry (CHEM 100 series). It is possible to use this 100 series credit to fulfil your degree requirements, but it is not recommended. After completion of the 100 series, a bridge course is required. This places students one semester behind in completing the general chemistry sequence. It is recommended for most students to complete the CHEM 200 series. However, be sure to talk with your [School of Chemical Sciences Academic Advisor](#) to determine what is best for your individual case.

AP Calculus AB: An earned score of 4 or 5 on the AP Calculus AB test will place you into MATH 231, however we strongly suggest that if you earn a 4 on the AB test, you instead take MATH 221.

AP Calculus BC: An earned score of 3 or 4 on the AP Calculus BC test will place you in MATH 231, a score of a 5 will place you in MATH 241. We strongly suggest that with a score of 3 or 4 you start in MATH 221. With a score of 5, you should start in MATH 231.

AP Physics C: An earned score of a 5 on the Physics C, Electricity and Magnetism or Physics C, Mechanics will earn credit for Physics 212 or 211 respectively.

Even significant AP credit rarely leads to a decrease in time to degree. However it does free up some credits and makes the academic rigor more manageable. This frees up time for other items; jobs, student organizations, undergraduate research, other projects, and much more. Overall we highly

suggest taking AP classes. The rigor which is often involved in these courses, is good preparation for the rigors of classes at UIUC.

2.2.3.2 Proficiency Exams

Certain subjects offer proficiency exams to obtain credit for a course. The exams are offered during the first week of classes. This is an excellent way to obtain credit in material you know well but did not have the chance to take AP Exam. The following webpage lists courses with proficiency exams and provides material to allow you to prepare <http://cte.illinois.edu/testing/pnp/proficiency/dept.html>.

2.2.3.3 Transfer Credit

Some students will start their freshman year with credits from another academic institution due to dual enrollment courses during high school or courses taken during the summer. To receive credit for these courses, you must send your transcripts to the university. [Transferology.com](http://transferology.com) is a great resource to determine likely transfer credits. If your course does not show up as a transfer within transferology, this does not mean the course does not transfer. It may be that the course has never been articulated to UIUC yet. This is very common with regard to many foreign schools and smaller community colleges outside of Illinois. You can submit the syllabus and possibly course work for evaluation. Always keep all of your coursework until you graduate with your degree.

Many students take advantage of summer semesters to complete general education requirements or basic math and science courses at a community college or university near home or even taking advantage of the growing online coursework possibilities. It is best to make sure the course you are taking will transfer. Prior to taking any course at another institution, a meeting with your [School of Chemical Sciences Academic Advisor](#) is prudent.

2.3 ACADEMIC RULES

2.3.1 GPA Requirements

- The university requires that you maintain a 2.0 GPA to continue to be enrolled.
- The university requires that you earn a 2.0 GPA in your major classes as a graduation requirement.
- The department requires that you maintain a 2.5 UIUC GPA in order to stay in the Chemical Engineering program. Every semester the department checks GPAs and letters are sent to students with a UIUC GPA of 2.6 or less.

2.3.2 GPA Calculation

The University of Illinois uses a 4.0 system of grading which includes the plus (+) and the minus (-) in calculation. Grade points are evaluated based on the grade earned in the course according to:

Grade	Grade Points	Grade	Grade Points	Grade	Grade Points
A+	4	B-	2.67	D	1
A	4	C+	2.33	D-	0.67
A-	3.67	C	2	F	0
B+	3.33	C-	1.67	ABS	0
B	3	D+	1.33		

Your official GPA displays to the hundredths place and is truncated, not rounded. Official information regarding GPA calculation can be found <http://archive.registrar.illinois.edu/grades/GPA.html>.

A GPA calculator is available <https://secure.registrar.illinois.edu/GPACalculator/>.

2.3.3 Repeating Courses and Grade Replacement

Students will occasionally repeat a course either to improve knowledge or overall GPA. When a student elects to repeat a course, before the semester starts the student elects to replace the grade or not. When a student does not elect to replace the grade, both grades remain on the student record, and both grades are included in the grade-point average calculation, however the student can only earn credit for the course once. Note, courses completed with a D- or higher can be used to complete degree requirements. However courses completed with an F will not count toward the degree.

If a student elects grade replacement, the first grade is not used when computing GPA, even if it was a better grade. Both grades will be used in GPA calculation if the student fails the repeated course. Both course grades will appear on transcripts, but only the repeated course grade is used in GPA calculation.

Eligibility for course grade replacement requires an earned grade of C- or lower the first attempt. Students cannot have previously repeated the course for grade replacement and cannot have already been awarded a degree from the University of Illinois. Grade replacement is limited to no more than four distinct courses, up to a maximum of 10 semester hours, for grade replacement.

If you are thinking about repeating a course or using grade replacement, talk to your Academic Advisor ([School of Chemical Sciences Academic Advisor](#)) to see if it makes sense. They will then help you through the process. Official information regarding repeating courses and grade replacement is found <http://www.las.illinois.edu/students/courses/repeating/>.

2.3.4 Retroactive Drop of Courses

If a circumstance in your life that happens beyond your control and has affected your coursework you may petition to retroactively drop a course or even the whole semester. If you are thinking about this, please first consult your SCS Academic advisor ([School of Chemical Sciences Academic Advisor](#)). You will have to visit the LAS Dean ([College of Liberal Arts and Sciences](#)). You will be asked to provide reasonable proof of your circumstance and proof that the circumstance is beyond your control.

2.3.5 Independent Study Rules

Students may earn various types of independent study credit. Note that no more than 10 hours of independent study credit of any type may be applied to graduation requirements. Independent study courses include CHBE 297, 397, 496, 497, 499.

Additionally, a maximum of 3 credit hours of any combination of CHBE 496, 497, or 499 can be used to fulfil the 400-level Chemical Engineering Technical Elective requirement. You must take at least one CHBE 400 level course.

2.3.5.1 *Research Credit (CHBE 297, 397, 497)*

Students can work with a faculty member within the CHBE department to earn CHBE 297 (for 2nd year students), CHBE 397 (3rd year students), and CHBE 497 (4th year). Each faculty member has their own requirements for earning credit hours. However as a general guideline, students are expected to spend 4-5 hours in the laboratory each week for each 1 semester-hr credit of CHBE x97 taken. Prior to the start of each semester and Undergraduate Research Project summary form must be completed. This form is available from the [Academic Programs Specialist \(Jennifer Daly, jbyrd@illinois.edu\)](#) who handles administration of certain academic student services outside the Academic and Faculty Advisor's typical roles. This includes tutoring services and selection of UG students to assist as Classroom Assistants (similar to TA's) in CHBE courses. The Academic Programs Specialist is also where Chemical Engineering student organizations go to utilize their approved budgets and other financial needs.

Undergraduate Educational Office (RAL 99).

Independent study outside CHBE cannot count toward your degree. A CHBE professor may elect to actively co-advise you with an engineering science or engineering practice problem conducted within another program. You will register for the appropriate CHBE x97 course with your CHBE co-advisor. You cannot earn credit within two departments for the same individual study completed.

If you are interested in conducting research with a professor, you should look through the research conducted by CHBE professors, as well as other professors on campus. If a professor's work interests you, you can send them an email describing your interest in their work as well as a copy of your resume and unofficial transcript. You can speak to your [Chemical Engineering Faculty Advisor](#), [School of Chemical Sciences Academic Advisor](#), and upper classmen about best practices. Each year [Omega Chi Epsilon \(OXE\)](#) has an Undergraduate Research Opportunities Fair to facilitate conversations between current undergraduates and current graduate students (or postdocs) about their research and potential research opportunities.

Occasionally professors will have the opportunity for you to receive pay as compensation for your research work. You cannot receive both credit and pay for research completed in the same semester.

2.3.5.2 *Mentoring Credit (CHBE 397, 497)*

Each semester we offer 1 credit hour for junior and senior level student to serve as mentors for the cross curricular design projects. In addition to credit students gain management, mentoring, and design project experience. Responsibilities include meeting with assigned groups on a regular basis to monitor their progress, helping resolve group conflicts, encouraging teams, and providing evaluation of teams. A call for mentors, inviting students to apply, is sent out at the beginning of each semester. Dr. Josh Bennett (jeb4@illinois.edu) coordinates mentors for the projects.

2.3.5.3 *ChemE Car Credit (CHBE 397, 497)*

Students who are an active member of the ChemE Car team during freshmen and sophomore years can be considered for earning course credit for taking more of a leadership role in ChemE Car during junior (CHBE 397) or senior (CHBE 497) years. Generally, 1 credit of appropriate level is earned for each semester of active participation on ChemE Car. You do earn a letter grade for the independent study, so it is important to positively contribute to the team.

For more information on how to get involved with ChemE Car, contact a member of AIChE, attend an AIChE meeting, or talk to the AIChE faculty advisor, Dr. Rogers (sarogers@illinois.edu).

2.3.5.4 *Senior Thesis Credit (CHBE 499)*

A thesis subject is selected by the student and the advisor and the CHBE advisor with which the student is working. The senior thesis must be done under the supervision of a principle investigator within CHBE, no exceptions are made for this requirement. The thesis is submitted to the department head and the College of LAS Honors program. Further details are found <http://chbe.illinois.edu/sites/default/files/BS%20THESIS.pdf>. Students who are thinking of completing a senior thesis will typically do research in the years leading up to senior year. The writing of the senior thesis typically happens during senior year when the CHBE 499 credit is earned. Senior thesis projects must include a minimum of 5 hours and a maximum of 10 hours of CHBE 499 credit over 2 or more semesters. Rarely can 5 hours be completed in one semester, and no more than 5 credits can be earned in the same semester.

2.3.5.5 *Undergraduate Research Abroad (CHBE 496)*

CHBE 496 is a course designed to give students a mechanism to earn UIUC credit for research abroad. CHBE faculty members supervise your project during your semester abroad. Opportunities for undergraduate research abroad are occasionally announced on the UG Compass site. You may also identify your own research abroad opportunities.

2.4 ACADEMIC INTEGRITY

It is important that the integrity of the engineering profession be upheld. Further, it is important to the value of your UIUC CHBE degree to uphold the academic integrity of the institution. Be aware of the University Student Code found at <http://studentcode.illinois.edu>. As a member of the engineering profession, you are obligated to report potential academic misconduct if you are aware of it. Failure to do so in many situations outside of academia will result in negative repercussions.

2.4.1 AIChE Code of Ethics

The AIChE Code of Ethics is found at <http://www.aiche.org/about/code-ethics> and is reproduced here.

Members of the American Institute of Chemical Engineers shall uphold and advance the integrity, honor and dignity of the engineering profession by:

- Being honest and impartial and serving with fidelity their employers, their clients, and the public;
- Striving to increase the competence and prestige of the engineering profession;
- Using their knowledge and skill for the enhancement of human welfare.

To Achieve these Goals, Members shall:

- Hold paramount the safety, health and welfare of the public and protect the environment in performance of their professional duties.
- Formally advise their employers or clients (and consider further disclosure, if warranted) if they perceive that a consequence of their duties will adversely affect the present or future health or safety of their colleagues or the public.
- Accept responsibility for their actions, seek and heed critical review of their work and offer objective criticism of the work of others.
- Issue statements or present information only in an objective and truthful manner.
- Act in professional matters for each employer or client as faithful agents or trustees, avoiding conflicts of interest and never breaching confidentiality.
- Treat fairly and respectfully all colleagues and co-workers, recognizing their unique contributions and capabilities.
- Perform professional services only in areas of their competence.
- Build their professional reputations on the merits of their services.
- Continue their professional development throughout their careers, and provide opportunities for the professional development of those under their supervision.
- Never tolerate harassment.
- Conduct themselves in a fair, honorable and respectful manner.

2.4.2 Departmental Academic Integrity Policy

Guidelines for student discipline in academic integrity situations for the Department of Chemical and Biomolecular Engineering:

Typical Examples of Academic Integrity infractions:

1. Failure to properly cite sources in a report or presentation.
2. Glancing at other students' work on computers, quizzes or exams.
3. Submitting directly copied or substantially identical versions of other students' work. Submitted work must make a convincing case that the solution has come from the submitter's ideas. There should be no appearance of copying or paraphrasing others' work, either from the current year or previous years.
4. Bringing unauthorized materials to a quiz or exam (test aids).
5. Secretly collaborating on an examination.
6. Stealing research materials or in any way sabotaging other student's homework, projects or exam.

Department Recommended Guidelines for Discipline in Cases Where Academic Misconduct Has Occurred:

- Faculty may modify these practices to fit particular cases if the situation warrants.
- All offenses become part of the student's permanent record.

First offense:

1. Exam or quiz (test aids, collaboration, overt glancing, sabotage): zero on the exam
2. Homework assignment (collaboration, glancing, sabotage): zero on the assignment, and an additional 1/3 letter grade subtracted from final course total
3. Project (report) or presentation: depends on the severity of the cheating:
 - a. Willfully failing to cite sources: 1 letter grade
 - b. Glancing at other students' work on computers: 1/3 letter grade for each offense
 - c. Copying other students' work, submitting identical work, copying from previous semesters' work: zero on the project
 - d. Stealing research materials or sabotage: zero on the project

Second offense: **Failing grade for the course**

2.5 RECOGNITION PROGRAMS FOR SCHOLARLY ACHIEVEMENT

Various programs and mechanisms exist within the university, college, and department to recognize scholarly achievement. Many are described here.

2.5.1 James Scholar Program

Participation in the James Scholar Honors Program in the College of Liberal Arts and Sciences complements and enriches a student's educational experience. As part of the honors experience, a James Scholar can:

- participate in honors courses, including those designed for incoming students
- transform standard courses into honors courses
- receive early registration privileges
- work closely with professors
- apply for upper-level undergraduate research awards
- receive invitations to co-curricular and leadership activities
- be designated as a James Scholar on his or her transcript, awarded annually
- receive recognition at graduation

Visit <http://www.las.illinois.edu/students/honors/admission/> for more information about being admitted to the program, maintaining eligibility, and graduating with honors.

2.5.2 LAS Dean's List

The Dean's List is prepared each semester to honor all full-time students whose grade-point average (GPA) for that semester ranks in the upper 20 percent of their college. The minimum GPA establishing eligibility for the LAS Dean's List in 2018-2019 was 3.80 (this criterion changes each academic year but is generally consistent). Other eligibility criteria include completion of at least 14 hours of course work in which traditional letter grades are earned (i.e., excludes courses graded credit/no credit, satisfactory/unsatisfactory, and test-based credit that is graded pass/fail), and any course work completed through study abroad, subject to these same limitations. No consideration is given for the Dean's List until final traditional grades are in for courses designated I and DFR. If you believe you should be placed on the Dean's List as a result of a grade change or a grade received more than a month after the end of the semester, notify the LAS Honors Office to ensure that corrective action is taken. Most up to date technical requirements can be found <http://www.las.illinois.edu/students/honors/distinctions/>.

2.5.3 College Latin Honors in LAS

College Latin Honors within LAS is based on your class rank upon graduation. These change slightly year to year, but are similar each year. Most up to date technical requirements can be found <http://www.las.illinois.edu/students/honors/distinctions/>. The GPAs listed are used to determine LAS College Honors on graduation lists December 2016-August 2017.

- Summa Cum Laude, top 3 percent, GPA of 3.95
- Magna Cum Laude, top 7 percent, GPA of 3.90
- Cum Laude, top 12 percent, GPA of 3.82

To earn College Latin Honors, a student is required to have both the appropriate GPA and to have completed ONE of the following: 25 honors hours, 35 advanced hours, or Departmental Distinction. The minimum must be met by both the comprehensive University GPA (including transfer work) and the cumulative GPA of work taken on this campus.

2.5.4 Bronze Tablet

This recognition is awarded to the top 3 percent of students in each college of the University. Their names are inscribed on a Bronze Tablet that hangs in the Main Library. Students are notified of their eligibility by the College of LAS Student Academic Affairs Office.

2.5.5 Graduating With Departmental Distinction

To graduate with departmental distinction, one must graduate with a 3.5-3.79 GPA, high distinction 3.8-3.94 and highest distinction 3.95 or above.

3 STUDENT ADVISING & CAMPUS NAVIGATION

3.1 WHERE DO I GO FOR HELP?

Various forms of advising are available to students. Each have different roles in aiding your success within the program. Briefly each advising role is as such.

- **School of Chemical Sciences Academic Advisors** can aid in making sure you have met all degree requirements. Your SCS Academic Advisor should be your first choice for academic advice each semester for a variety of topics in the section below.
- **Chemical Engineering Faculty Advisors** can give guidance with a career focus.

3.1.1 School of Chemical Sciences Academic Advisor

Academic advising is alpha split based on your last name. The academic advisors are:

Dedo, Wolali	Last Names A-G	110B Noyes Lab	wdedo@illinois.edu	217-244-8531
Powers, Kimberly	Last Names H-N	110C Noyes Lab	powerska@illinois.edu	217-244-0263
Spinner, Todd	Last Names O-Z	110A Noyes Lab	spinner@illinois.edu	217-244-6605

The School of Chemical Sciences advisors are shared between chemistry and chemical engineering students. Your academic advisor will be instrumental in helping you in making your graduation plan and helping ensure you have met all degree requirements. SCS Academic Advising is located in 110 Noyes Lab. You can also email scs-advising@illinois.edu or visit the advising website at <http://publish.illinois.edu/scsadvising>. Your academic advisor can answer questions related to

- Graduation requirements
- Course selection each semester and 4+ year plans
- Problems with registration
- Declaring a minor and establishing an appropriate course sequence
- First-time registration
- Signatures for registration, late drops, etc.
- Transfer student credit articulation
- Course articulation and substitution
- General handouts and paperwork

3.1.2 Chemical Engineering Faculty Advisor

Each student is assigned a faculty advisor. Your faculty advisor will aid you in those advising matters which are more career oriented. After the 10th day of each fall and spring semester you will receive an email from Becky Lyle rlyle@illinois.edu indicating your faculty advisor. Generally, your faculty advisor will not change during your tenure at UIUC. If you do not know who your faculty advisor is, you can email Becky to find out. Your faculty advisor can address topics such as

- What can I do to improve my performance in classes?
- Which technical electives should I take?
- Can you help me select a minor?
- Career choices – What should I be doing now to make sure I can do "x" in the future?
- Personal Issues
- Should I change my major?
- Can I have a letter of recommendation or reference?
- Graduate school choices – How do I know if graduate school is right for me? Which graduate schools are best for me if I want to study "x"?

3.1.3 Academic Programs Specialist

The Academic Programs Specialist's (Jennifer Daly, jbyrd@illinois.edu) role is to handle administration of certain academic student services outside the Academic and Faculty Advisor's typical roles. This includes tutoring services and selection of UG students to assist as Classroom Assistants (similar to TA's) in CHBE courses. The Academic Programs Specialist is also where Chemical Engineering student organizations go to utilize their approved budgets and other financial needs.

3.1.4 Undergraduate Educational Office (RAL 99)

The Undergraduate Educational Office (UEO) is located in RAL 99 and is staffed by Becky Lyle, rlyle@illinois.edu. This office provides services to the undergraduates, faculty and staff. The UEO supplies undergraduates with their forms (such as petitions, late add forms, four year program of study in Chemical and Biomolecular concentration, concentration check list, list of technical electives and independent study forms), maintains student records, helps undergraduates with holds on their accounts, and helps with registration challenges.

The Undergraduate Educational Office also distributes communication notices to undergraduates through Compass and email. UEO accepts RSVPs to convocation, provides guest tickets, attends convocation to check in the graduates and assists as need. UEO assigns new undergraduates to the department with faculty advisors each semester ([Chemical Engineering Faculty Advisor](#)).

The Homework Lockboxes are located outside of the UEO next to the RAL storeroom, RAL 94. For many of your CHBE courses, you will turn assignments in at this location.

3.2 DEPARTMENTAL RESOURCES (TUTORING AND COMPUTER LABS)

The Chemical and Biomolecular Department supplies various learning resources to our students. These resources are continuing to evolve with technology and user interest in the programs. If you do not see a departmental resource you might be able to benefit from, contact the Academic Programs Specialist (Jennifer Daly, jbyrd@illinois.edu).

3.2.1 ChBE Tutoring Program

The department's tutoring program is to support student learning in chemical engineering courses. Tutors are available to students taking ChBE classes who want to improve their GPA, have other personal issues that warrant services, or just want a consistent time and place to work on coursework. Tutoring services are provided at no cost to students.

Tutoring takes place in tutoring rooms assigned each semester. The schedule is developed shortly after the beginning of a semester.

methods are utilized and fliers are posted in Roger Adams Laboratory when the schedule is created.

The department also employs tutors as part of the tutoring program. Tutors must have completed the course for which they would like to tutor and have a solid GPA generally above a 3.70. A tutor will earn a competitive hourly wage for various responsibilities centered around helping assigned tutees better understand the subject matter.

For questions about the schedule, becoming a tutor, or anything else related to ChBE Tutoring, contact the Tutoring Coordinator (Jennifer Daly jbyrd@illinois.edu).

3.2.2 Department Computer Lab and Undergraduate Learning Center

The department invites chemical engineering students to make use of the computers, printers, and space in the ChBE Department Computer Lab located in 211 Noyes Lab and the ChBE Undergraduate Learning Center in 308 Noyes Lab. All concerns and inquiries can be addressed to the lab manager.

The department provides chemical engineering students with up to 200 pages of prepaid printing each semester, when using these facilities. If you print over 200 pages, a charge of \$0.10 is assessed for each page. This assessment is applied to your student account at the end of the semester.

You may check your print count as you choose. On the Papercut window, click on "Details" and Log-on to see your activity. You will notice a credit of \$20 to support the 200 pages of free printing that is provided by the department.

If you have problem solving needs while using the computers or printers in the lab, instructions on how to seek assistance are posted on the wall. Although the printer paper trays are filled daily, if paper runs out, please visit another campus facility for your printing needs.

Department Computer Lab – 211 Noyes Lab

The Department Computer Lab contains 19 workstations and two printers, along with white boards.

Undergraduate Learning Center – 308 Noyes Lab

The Undergraduate Learning Center has 21 workstations, multiple tables, white boards, chairs, and a kitchenette with a microwave and refrigerator making it an ideal place to complete individual or group work. The Undergraduate Learning Center is also used to occasionally hold tutoring sessions and some

TA office hours. Additionally there is a private meeting room which can be reserved for more privacy or to practice presentations. Reservations are made by marking your reservation on the reservation calendar located in the room; otherwise the room is for general use. As of Summer 2019, the Undergraduate Learning Center was closed for HVAC work. It is expected to reopen in Fall 2019.

3.2.3 Available Tutoring in Courses Outside CHBE

Various programs outside of CHBE have learning assistance programs and resources. Some of these are pay for service and others are provided at no direct cost to you. Follow the links for more information about each.

Chemistry Department tutoring: http://www.chem.uiuc.edu/clcwebsite/tutoring_services.html

Physics Department tutoring: <http://physics.illinois.edu/courses/tutors.pdf>

Math Department tutoring: <http://www.math.illinois.edu/UndergraduateProgram/tutoring.html>

Center for Academic Resources in Engineering (CARE): <http://publish.illinois.edu/engineering-care/>

3.2.4 Libraries

Undergraduates within our program enjoy the use of all libraries on campus. A complete list is located <http://www.library.illinois.edu/>. Two libraries which are most frequented by our students are:

- Chemistry Library located in Noyes Laboratory at 505 S. Mathews Ave. Urbana, IL 61801, phone 217-333-3737, online <http://www.library.illinois.edu/chx/>.
- Grainger Library located at 1301 W. Springfield Ave. Urbana, IL 61801, phone 217-333-3576, online <http://search.grainger.illinois.edu/top/>.

3.3 CAMPUS NAVIGATION

3.3.1 How to Transfer into CHBE from a department within LAS

In order to transfer into CHBE, you must apply to the department and obtain departmental permission. Times you are permitted to transfer can be found

<http://www.las.illinois.edu/prospective/intercollegiate/> and are generally a couple weeks at the beginning and again in the middle of each semester. The department will primarily make a transfer evaluation based on three things:

1. Your academic ability at UIUC. This is evaluated by a UIUC GPA of at least 3.10 based on at least 2 semesters of work. GPA padding, excessive use of independent study, courses not required for graduation, or significant underloading of coursework does not look favorably in a transfer application.
2. Your academic ability within CHBE. This is evaluated by using your course grades within CHBE courses. For successful transfer the department is looking for a “C” or better in two of the following: CHBE 221, 321, or 421. The department will also look at other CHBE courses you’ve taken in order to make a determination of your ability.
3. A satisfactory graduation plan within 10 semesters of college entry. This plan should not include excessive overloads, or put yourself in a position where many difficult classes are taken in the same semester. For instance a plan which requires CHBE 430, 431, 440 and CHEM 315 to be taken in the same semester is not acceptable. See Appendix C: Curricular Paths for a suggested 4 year program to familiarize yourself with what is considered a normal schedule. More information about the 10 semester limit can be found here:
<http://www.las.illinois.edu/students/courses/loadcredit/>

If you are currently a UIUC student **in a major within the College of Liberal Arts and Sciences** visit https://apps.atlas.illinois.edu/FormBuilderSurvey/Survey/LAS_Administration/Student_Academic_Affairs/Curriculum_Change_Form/

If you are currently a UIUC student **in a major outside the College of Liberal Arts and Sciences** visit https://apps.atlas.illinois.edu/FormBuilderSurvey/Survey/LAS_Administration/Student_Academic_Affairs/ICT_Request/

In each situation your request will be forwarded to the CHBE department and you will be contacted if there are any further steps.

3.3.2 How to Transfer into CHBE from Another Institute of Higher Education, Community College or University

Transfer applicants who have completed more than 6 semesters or 80 hours of coursework are subject to an additional review. Priority is given to students who can complete degree requirements within a total of ten semesters in college (not counting summer sessions, more info here <http://www.las.illinois.edu/students/courses/loadcredit/>). A grade point average of 3.20 or higher (A=4.00) is required for admission. Applicants are considered on a space available basis.

Chemical and Biomolecular Engineering is open to Sophomore and Junior-level transfers. For full transfer requirements please visit http://admissions.illinois.edu/Content/docs/Handbook_LAS.pdf and navigate to Chemical and Biomolecular Engineering.

Due to the specialized nature of Chemical and Biological Engineering curriculum, transfer students typically require a total of five or six semesters on our campus to meet graduation requirements. We believe that this extra semester or two is a worthwhile investment, if it maximizes your opportunity for success and our experience strongly suggests that it does.

CONTACT INFORMATION: Allie Teagarden, Director of Recruitment & Admissions, University of Illinois, College of Liberal Arts & Sciences, 2002 Lincoln Hall, 702 South Wright Street, Urbana, IL 61801; Phone: (217) 333-1703-- Fax: (217) 244-9498-- E-mail: las-newstudent@illinois.edu

3.3.3 How to Transfer Out of CHBE

If you are thinking that Chemical and Biomolecular Engineering might not be a good fit for you, contact your [School of Chemical Sciences Academic Advisor](#). This person will be able to help you explore some other majors which may build upon current coursework and interests. You can also be referred to the appropriate advisor in other majors.

3.3.4 LAS Navigation for things not handled by SCS Advisors

The main office used for LAS administrative matters is 2002 Lincoln Hall. A centralized website containing most of the forms you need is here <http://www.las.illinois.edu/students/forms/>. You will need to go to this office for the following:

- Transferring to CHBE
- Course overloads (more than 18 credit hours in one semester)
- Course underloads (less than 12 hours) – typically only approved for graduating seniors in final semester
- Grade replacement
- Late Add or Late Drop of a Course
- Petition for retroactive course drop
- Petition for retroactive withdrawal

3.3.5 Graduation

Steps to take as you are nearing graduation are found here:

<http://www.las.illinois.edu/students/graduation/>. There are various commencement ceremonies throughout the year depending on when you are graduating. Additionally, in order to better serve our prospective and current students, we ask that you let the [Career and Educational Services](#) Office know of your plans as you are graduating. This lets us recruit students and gives some career guidance to current students. You can click on the first picture on www.careers.scs.illinois.edu and input your plans.

3.3.5.1 *Spring Graduation*

The University holds a Commencement ceremony for all graduating students. Students are invited to attend the campus wide commencement. The Department of Chemical and Biomolecular Engineering holds a convocation ceremony at the end of spring semester, typically on the Sunday after final exams.

3.3.5.2 *Fall Graduation*

If you are graduating in fall semester, you are invited to the LAS college wide ceremony. The Department of Chemical and Biomolecular Engineering holds a small convocation ceremony at the end of fall semester.

4 CAREER AND EDUCATIONAL SERVICES

4.1 CAREER SERVICES

As a CHBE student you have various career services offices available to you. These will aid in obtaining employment both during your academic tenure through co-ops and internships as well as starting your career upon graduation.

4.1.1 SCS Career Counseling & Placement Services

The SCS Career Counseling & Placement Services office is for Chemistry and Chemical Engineering Students. The office is located at 105 Noyes Laboratory, 505 S. Mathews Ave., Urbana, IL 61801, (217) 333-1050 or online at <http://careers.scs.illinois.edu>. The office can help with matters such as:

- Deciding on a career path
- Resume writing
- Job shadow program
- Internship and co-op searching
- Permanent employment search and services
- Improving interviewing skills

If you are looking for a coop/internship during your undergraduate time here: at the latest start visiting the office your first semester on campus and attend all of the related career fairs.

If you are looking for full time employment: at the latest start visiting the office spring of your junior year.

4.1.1.1 *Resume Tips*

The [SCS Career Counseling & Placement Services](#) office will be able to help you develop a resume which will best represent your skills. A few highlighted tips are included here:

- Keep your resume to 1 page
- Margins, bolding, capitalization, format and order must be consistent
- Only include relevant information – this does mean that you may have many different versions of your resume depending on the job you are applying for
- Proofread
- Omit personal pronouns
- Use incomplete sentences in list form with action verbs

4.1.2 Engineering Career Services

The Engineering Career Services office is available to Chemical Engineering Students. The office is located at 3270 Digital Computer Lab, 1304 W. Springfield Ave., Urbana, IL 61801, (217) 333-1960, and online at <https://ecs.engineering.illinois.edu>. The Engineering Career Services office has similar services as the [SCS Career Counseling & Placement Services](#) except on a scale that supports all engineering programs.

Company recruiting efforts sometimes lead the recruiting team to Engineering Career Services. Often chemical engineering employers will only work with the SCS Career Placement office. CHBEs have a unique advantage that they can utilize the services of both job placement channels.

4.1.3 Graduate and Professional School

About 10% of graduates from our department attend graduate or professional school. If you are thinking of graduate school, talk to your [Chemical Engineering Faculty Advisor](#), the [SCS Career Counseling & Placement Services](#), and use these highlighted tips:

- Start early – planning for and preparing your dossier for graduate school frequently requires planning and action in the sophomore and junior years
- Maintain a strong GPA
- Obtain relevant experience – such as undergraduate research for graduate school, or proper work/volunteer experience for professional school
- Research and evaluate potential institutions – for graduate school, also look into possible Principle Investigators you might be working with during your degree
- Develop relationships with potential references
- Take appropriate exams a year in advance – GRE (graduate school), MCAT (medical school), etc.
- Watch deadlines and have your application reviewed by [SCS Career Counseling & Placement Services](#) and/or your [Chemical Engineering Faculty Advisor](#).

4.1.4 FE Exam/Professional Engineering Licensure

Specific requirements for Professional Engineering (PE) licensure is regulated individually by each state, however the process of becoming a registered PE is the same:

1. Pass the Fundamentals of Engineering (FE) exam
The FE exam is best taken during senior year, or shortly after graduation. The exam is computer based and given at various times in the year. The cost is a few hundred dollars depending on which testing location you choose. Some students will use a passing FE score as an interview topic even if the position they are applying for does not require a PE license. The FE exam is valid for all 50 states and territories. By passing the Fundamentals of Engineering (FE) examination, you have taken the first step toward professional licensure. You may then call yourself an Engineering Intern (EI) or an Engineer in Training (EIT) while you gain experience. You can find more information and register for the exam here: <http://ncees.org/exams/fe-exam/>.
2. Gain professional experience and determine the licensure requirement in the state(s) you want to practice
Every state, along with the District of Columbia and the U.S. territories have their own licensing board which administers the PE exam and determines what is considered professional experience. What is defined as professional experience varies from state to state but it generally looks like four years of experience working with a registered PE.
3. Prepare for and take the PE exam
Most states require you to pass the PE exam to obtain licensure. Some will let you take the PE exam before your professional experience, however you will not be licensed until you have completed the necessary work experience.

4.2 EDUCATIONAL ENHANCEMENT

4.2.1 Chemical Engineering Student Organizations

The department supports a number of student organizations who help create a better learning and growth environment for students. The organizations listed here receive departmental financial support. A more complete list of engineering organizations can be found through engineering council at <http://www.ec.illinois.edu/inv/societies.php>.

4.2.1.1 *American Institute of Chemical Engineers (AIChE)*

AIChE is the world's leading chemical engineering professional organization, with members spanning 93 countries and a variety of industries and areas of research. The organization provides networking opportunities and access to a wealth of information about the latest techniques in chemical engineering. Undergraduate students are able to join AIChE for free through the ScaleUp initiative in order to get acquainted with the organization at an early age.

The University of Illinois AIChE Student Chapter was founded in 1927 and holds the following purpose and responsibilities:

- To promote the professional development of its members through its programs and via relations with its own student members, faculty, with other Student Chapters and with the parent body, the American Institute of Chemical Engineers.
- Establish a professional standard of conduct and draw its members from those who subscribe to this standard.
- Provide an organization that promotes the wider recognition of engineering as a profession.
- Provide forums where its members may meet with their colleagues to discuss mutual interest and problems.
- Publish a newsletter to create greater awareness of our activities and the chemical engineering profession.

To learn more about AIChE, contact one of the following persons:

Chapter President (2019-20): Anna Weldton-Arndt (arw2@illinois.edu)

Chapter E-mail: aiche@illinois.edu

Office Location: NL 50

Chapter Advisor: Simon Rogers sarogers@illinois.edu

4.2.1.2 ChemE Car

AIChE's annual Chem-E-Car Competition engages college students in designing and constructing a car powered by a chemical energy source that will safely carry a specified load over a given distance and stop.

The competition, which involves multiple regional competitions and a final competition at the Annual Student conference, increases awareness of the chemical engineering discipline among the public, industry leaders, educators, and other students.

To learn more about AIChE's Chem-E Car, contact one of the following persons:

Chem-E Car Chair (2019-20):

AIChE President (2019-20): Anna Weldton-Arndt (arw2@illinois.edu)

Chem-E Car Faculty Advisor: Simon Rogers (sarogers@illinois.edu)

4.2.1.3 National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE)

NOBCChE is dedicated to building an eminent cadre of people of color in science and technology. In pursuit of this mission NOBCChE initiates and supports local, regional, national, and global programs that assist people of color in fully realizing their potential in academic, professional, and entrepreneurial pursuits in chemistry, chemical engineering, and related fields. The organization promotes careers in science and technology as an achievable goal for elementary, middle, and high school students. In addition, NOBCChE encourages college students to pursue graduate degrees in the science, technology, engineering, and mathematics (STEM) disciplines. NOBCChE also provides professional development programs, networking and mentoring for early to mid-career professionals. NOBCChE makes a difference!

To learn more about NOBCChE, contact one of the following persons:

Chapter President (2019-20): TBD

Office Location: NL 50

Chapter Advisor: Joshua Bennett (jeb4@illinois.edu)

4.2.1.4 *Omega Chi Epsilon (OXE)*

OXE is the National Honor Society for Chemical Engineering. The Society promotes high scholarship, encourages original investigation in chemical engineering and recognizes the valuable traits of character, integrity and leadership. It serves both undergraduate and graduate students and fosters meaningful student-faculty dialogue.

The name is based upon our motto: Ode Chrototos Eggegramai which means in this society, professionalism is engraved in our minds. The letters OXE, or their Greek equivalent of WCE, represent Order of Chemical Engineers.

The key represents the objectives of Omega Chi Epsilon. The four arms of the Maltese cross represent the first four objectives:

1. RECOGNITION - to recognize excellence in chemical engineering
2. INVESTIGATION - to promote original investigation and innovation in chemical engineering
3. SERVICE - to provide service the chemical engineering department or school and its student body
4. COMRADESHIP - to promote comradeship among chemical engineers

These four are bound intimately together by the fifth,

5. PROFESSIONALISM - to promote honesty, integrity and social responsibility: the hallmarks of professional ethics represented by the circular maroon crest in the shape of a globe, reminding us of the world-wide scope of chemical engineering. The gold Greek letters, Omega, Chi, Epsilon, are inscribed on a white band encircling the globe. The crossed retorts, the integral sign, and the bolt of lightning represent the three main tools of the chemical engineer: chemistry, mathematics, and physics.

To learn more about OXE, contact one of the following persons:

Chapter President (2019-20):

Office Location: NL 50

Chapter Advisor: Diwakar Shukla diwakar@illinois.edu

4.2.1.5 *Undergraduate Advisory Board (UAB)*

The UAB is an organization commissioned by the department to represent the student body. The UAB works with the department to continually improve the program. The membership consists of one rep from each year, freshmen, sophomore, junior, senior, one rep from each of the student organizations, AIChE, NOBBChE, OXE, and one international representative.

To get involved with the UAB contact one of the following persons:

UAB President:

Office Location: NL 50

UAB Advisor: Joshua Bennett jeb4@illinois.edu

4.2.2 Co-Ops and Internships

Co-ops and internships are great ways to help you make a decision on a career path. Each give you the opportunity to work for a company for an extended period of time. This is a great atmosphere to try different companies and different careers in order to help you decide on what you may target as the start of your career.

Generally internships are shorter, on the order of 1 semester, and typically this is summer semester. Co-ops are generally longer, spanning an experience over two semesters. These are typically a Spring-Summer or Summer-Fall arrangement.

Both the SCS Career Counseling & Placement Services office and the Engineering Career Services office are invaluable resources to help you find a position. If you are interested in obtaining a co-op or internship while you are UIUC, you should begin the process your first semester on campus.

4.2.3 Study Abroad

If you are interested in studying abroad, the sooner you start planning, the better. There are a number of great resources designed to ensure that you have a smooth study abroad experience.

The resource that most of our students use is the International Programs in Engineering (IPENG) office. Visit their website <http://engineering.illinois.edu/ipeng/> or office, located at 210 Engineering Hall. They can help you find programs in various countries as well as assist with the logistics of applying to study abroad.

Another great resource is the Study Abroad Office, their website is <http://studyabroad.illinois.edu/> and the office is located at 112 International Studies Building (910 S. Fifth St). The study abroad office requires that all students take an orientation before starting a study abroad application. This application includes watching a video and attending an orientation.

Joshua Bennett (jeb4@illinois.edu) can answer questions regarding study abroad transfer credit and substitution or study abroad course sequencing. When scheduling an appointment with Dr. Bennett you must submit an emailed copy of course descriptions (syllabi preferred) for courses that you plan to take abroad. In addition, you should determine which Illinois courses most closely match the courses that you would like to take. Have course numbers and descriptions at UIUC as well as your abroad institution summarized for ease of evaluation. Also, make sure you bring a 'Study Abroad Course Approval Summary Form' which you can pick up from the Study Abroad Office.

4.2.4 Undergraduate Research

Students looking to enrich their undergraduate experience in a way which will challenge them academically may be interested in performing undergraduate student research in a lab at the university within the CHBE Department or outside. Students interested in possibly attending graduate school might particularly be interested in undergraduate research. This experience may help the student determine if graduate studies is appropriate for their career.

Generally research positions earn course credit. Occasionally positions can be paid. When paid positions arise, they are typically offered to more veteran undergraduate researchers first.

In order to get involved with undergraduate research, you will first want to find a faculty member or graduate student whose research interests you. Then make contact with the researcher. This can be via email or stopping by their office while the door is open. Additionally Omega Chi Epsilon (OXE) organizes a research fair on an approximately annual basis to help pair undergraduate students with research groups actively looking for undergraduate researchers. Look to the OPEN LEARNING – Chemical Engineering Undergraduates space on compass 2G.

4.3 FINANCIAL AID AND SCHOLARSHIPS

4.3.1 University Based Aid

The University of Illinois at Urbana-Champaign awards over 1,500 scholarships annually based on a variety of factors including academic achievement, talent, leadership, geographical location, field of study, and financial need. The Office of Student Financial Aid is a great place to start your aid search <http://osfa.illinois.edu/>. For a listing of the University of Illinois Scholarships available visit <https://secure.osfa.illinois.edu/scholarship-database/index.aspx>.

4.3.2 College of Liberal Arts and Sciences Aid

The LAS Honors program manages both donor-based scholarships and application-based scholarships. Donor-based scholarships are offered to students who meet the established criteria; they are not available through an application process. For the application-based scholarships, only students meeting all the required criteria will be considered.

Additional information about each of the scholarships and their individualized application process are posted as they are available for submission.

<http://www.las.illinois.edu/students/honors/scholarships/>

4.3.3 College of Engineering Aid

Freshman scholarship decisions are based on your application for admission. No other information is needed. The size of engineering scholarships varies from \$2,000 to \$15,000. Many are renewable for up to four years. The total amount available to each student is limited to cost of attendance. The scholarships available can be found here <https://grainger.illinois.edu/admissions/costs/undergraduate>.

Continuing student scholarships are quite diverse with some requiring an application and others based on academic performance only. It is a good idea to submit an application each year for scholarships for continuing students. <https://grainger.illinois.edu/admissions/costs/undergraduate>

4.3.4 Departmental Scholarships to Current Students

The Department of Chemical and Biomolecular Engineering awards nonrenewable scholarships annually to qualified undergraduates. Scholarships are granted according to the wishes of gift donors, including financial need or merit-based scholarships or the discretion of the Department Head. Faculty members are also solicited to nominate their highly productive and successful students. Students have an opportunity to nominate themselves via the self-nomination process. The Awards & Scholarships Committee selects students whose contributions significantly impact the department, campus, or community in the areas of research, teaching, service, leadership, and/or scholastic merit.

Requests for self-nomination are emailed to students and students submit applications to Becky Lyle (rlyle@illinois.edu) for review by the Awards & Scholarships Committee.

4.4 STUDENT SERVICES

4.4.1 Women's Resources Center

Women's Resources Center is a confidential resource related to sexual assault/rape, sexual harassment, stalking, and abuse within a relationship (sometimes called dating or domestic violence). This means they can talk with students and provide supportive counseling and advocacy without the information going any further unless they decide to report the situation! You can find them on the web at <https://oiir.illinois.edu/womens-center> or <http://wecare.illinois.edu/>, in person at 703 S. Wright St., 2nd Floor Champaign, IL 61820, email womenscenter@illinois.edu, or phone 217-333-3137.

4.4.2 Office of Minority Student Affairs (OMSA)

The Office of Minority Student Affairs (<http://omsa.illinois.edu/>) provides leadership in developing, implementing, coordinating and operating student support services, events and activities that are designed to assist underrepresented students' personal development, academic achievement and graduation. The OMSA is one of the longest-running and most comprehensive support programs in the country. The office's goals are to:

- Assist with students' adjustment to campus by coordinating guidance and counseling support among other campus units, such as Student Affairs departments, colleges and the many academic departments;
- Assist campus units and student organizations with the creation of environments and programs to support and bolster minority students' success and continuation at the University. Additionally, OMSA helps academic units monitor the progress of students and makes appropriate referrals to campus units, employers and graduate and professional schools;
- Promote and develop educational opportunities and enrichment activities to help facilitate the educational and personal growth of student participants through organized activities and collaborative efforts with Student Affairs departments and other campus units.

4.4.3 Emergency Dean

The Emergency Dean program (<http://odos.illinois.edu/emergency/>) is an on call afterhours program that operates 7 days/week, from 5 pm -8:30 am as a part of the Office of the Dean of Students. The Emergency Dean is a full time employee of the university who volunteers to be on call at home.

The Emergency Dean can be reached at (217) 333-0050 and supports students who are experiencing an emergency situation after 5 pm, in which an immediate University response is needed and which cannot wait until the next business day. The Emergency Dean is not a substitute for trained emergency personnel such as 911, Police or Fire. If you are experiencing a life threatening emergency, call 911.

Examples of When to call the Emergency Dean:

- A student has been seriously injured in a car accident and may not make it. A group of the Illinois students is in the hospital waiting room upset and awaiting news about the student's condition.
- A group of students living in an apartment complex experienced flooding in their apartments at 9 pm. They are not getting any assistance from the complex management, are displaced and need assistance finding lodging for the night.
- A parent wants university assistance in notifying a child, who is a student, about the sudden death of the student's other parent.

Examples of Inappropriate Uses of the Emergency Dean:

- You are sick in the middle of the night and anticipate missing an exam.
 - What to do instead: Email your professor about your illness. Seek medical attention. Contact the Student Assistance Center during business hours to request an absence letter if one is needed.
- You need to leave campus unexpectedly one evening to return home to tend to a family emergency. You will not be in class for the next several days.
 - What to do instead: Send an email to your instructors as soon as possible to inform them of your circumstances. Or contact the Student Assistance Center the next business day to request that a notification be sent to your instructors.
- You are extremely worried about a final exam tomorrow. Your anxiety has grown so intense that you can't breathe and you think you are having a panic attack.
 - What to do instead: Call the Crisis Line at (217) 359-4141 or call Dial-A-Nurse (217) 333-2700. Or call 911 to seek emergency services.

4.4.4 Disability Resources

The mission of the Division of Disability Resources and Educational Services (DRES) is to ensure that qualified individuals with disabilities are afforded an equal opportunity to participate and benefit from the programs, services and activities of the University of Illinois at Urbana-Champaign through the identification and enactment of reasonable modifications to institutional policies and procedures, the provision of effective auxiliary aids and services, the establishment of innovative educational services, and the pursuit of interdisciplinary disability research.

To obtain disability-related accommodations, services, and council through DRES, please contact them by telephone 217-333-1970, email disability@illinois.edu, or visit <http://www.disability.illinois.edu>, or in person at 1207 S. Oak St. Champaign, IL 61820.

4.4.5 Counseling Center

The Counseling Center is committed to providing a range of services intended to help students develop improved coping skills in order to address emotional, interpersonal, and academic concerns. The Counseling Center provides individual, couples, and group counseling. All of these services are paid for through the health services fee. The Counseling Center offers primarily short-term counseling, but they do provide referrals to the community when students could benefit from longer term services.

The Counseling Center can be found on the web <http://counselingcenter.illinois.edu/>, in person at 610 E. John St. Champaign, IL 61820, or by phone 217-333-3704, TTY: 217-244-9146.

4.4.6 McKinley Health Center

McKinley Health Center (<http://www.mckinley.illinois.edu/>) serves the students at the University of Illinois at Urbana-Champaign. The Health Service Fee, which is paid as part of your enrollment, provides the funds to prepay many of your health care needs. (See the [Health Care Coverage](#) page and the [Health Care Coverage FAQ](#) for information on the differences between the Health Service Fee and the Student Insurance Plan.)

Emergency care

McKinley can provide most of your non-emergency health care. Emergency care is provided by area hospitals. If you have an emergency, call 911 (9-911 from campus.) Carle Foundation Hospital or Provena Covenant Medical Center have emergency departments and ambulance service.

Primary Care Providers

You're automatically assigned a Primary Care Physician when you enroll. The goal is for you to see the same doctor while you're at the University. Having a doctor who is familiar with you and your needs increases the quality of care you receive. You can change doctors if you want, but all the doctors are among the finest available.

Visiting McKinley

Using McKinley couldn't be easier. If you're ill and think you need to visit McKinley, in most cases you'll start by contacting Dial-A-Nurse at 217-333-2700. This health care professional will answer many of your questions and suggest a course of action including scheduling an appointment if indicated. You can also schedule an appointment yourself on-line or by phone.

McKinley's convenient location is easily accessible to most of the University of Illinois campus. They are located at 1109 S. Lincoln Ave. on the south-eastern side of campus. There is metered parking but check the parking tips section before your visit. When you arrive at McKinley and have an appointment, use the convenient Self Check-in Stations to let them know you're there.

4.4.7 24 Hour Champaign County Crisis Line

Call 217-359-4141 for immediate emotional assistance outside of the regular hours of the Counseling Center and McKinley.