



Chemistry Department

2014 Undergraduate Handbook

<http://www.siu.edu/artsandsciences/chemistry>

The Chemistry Department at SIUE pursues excellence in teaching and research. A number of faculty have achieved national and even international reputations in their areas of chemistry; they are your teachers. You can be proud of the chemistry degree you earn from this department.

Because it is important to take required courses in the right order, you should plan your curriculum with the assistance of your chemistry faculty mentor. This Handbook will assist you in your planning and provide information about the Department of Chemistry. Please consult this Handbook before you meet with your mentor and advisor.

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Opportunities in Chemistry at SIU Edwardsville

Career Outlook

Many opportunities in a wide variety of fields are open to a person with a chemistry background. Chemists work as analysts, environmentalists, criminologists, librarians, patent examiners, production foremen, researchers, teachers and writers. They work for companies that produce everyday needs such as fertilizers, pharmaceuticals, plastics, processed foods and semi-conductors; for governmental laboratories federal, state and local; in sales; for hospitals; and for high schools, colleges, and universities.

Employment rates among degreed chemists have been about half the unemployment rate of the general population. In 2013, the overall unemployment rate amongst Chemists surveyed by the American Chemical Society was 3.4%. This rate is above the usual rate of 2% during relatively good economic times.

Current statistics about the job outlook for chemists are available at:

<http://www.acs.org/content/acs/en/careers/salaries.html>

In 2013, the median annual salaries for chemists were: \$73.3K (B.S degree); \$88.7K (M.S.) and \$102.2K (Ph.D.). Starting salaries in industry for inexperienced B.S. graduates range from \$26,000 to \$45,000. Prospects appear bright for employment and salary increases.

The American Chemical Society has an excellent career advice webpage at:

<http://www.acs.org/content/acs/en/careers/whatchemistsdo.html>. Descriptions of careers in the following areas are available:

<i>Agricultural Chemistry</i>	<i>Consulting</i>	<i>Inorganic Chemistry</i>
<i>Analytical Chemistry</i>	<i>Consumer Product Chemistry</i>	<i>Materials Science</i>
<i>Biochemistry</i>	<i>Environmental Chemistry</i>	<i>Medicinal Chemistry</i>
<i>Biotechnology</i>	<i>Food and Flavor Chemistry</i>	<i>Organic Chemistry</i>
<i>Catalysis</i>	<i>Forensic Chemistry</i>	<i>Oil and Petroleum</i>
<i>Chemical Education</i>	<i>Geochemistry</i>	<i>Physical Chemistry</i>
<i>Chemical Engineering</i>	<i>Hazardous Waste Management</i>	<i>Polymer Chemistry</i>
<i>Chemical Information Specialists</i>	<i>Inorganic Chemistry</i>	<i>Pulp and Paper Chem.</i>
<i>Chemical Sales</i>	<i>Materials Science</i>	<i>R&D Management</i>
<i>Chemical Technology</i>	<i>Medicinal Chemistry</i>	<i>Science Writing</i>
<i>Colloid and Surface Chemistry</i>	<i>Organic Chemistry</i>	<i>Textile Chemistry</i>
<i>Water Chemistry</i>		

Chemists in Industry

More than 60% of all chemists work in private industry. Some conduct research, applying scientific knowledge to the manufacture of new and improved materials. Others in industry are directly involved in on-line production, manufacturing millions of tons of a high-quality product according to a detailed production schedule and budget. Such products might be fertilizers, herbicides, drugs, synthetic fibers, polymers or steels. Other chemists verify the quality of the products, advertise them, call on potential users or apply for a patent. The health and safety of workers in the plant and the potential harm of waste products also may be the responsibility of chemists. Information processing, technical writing and plant management are other industrial positions in which chemists may be found. Some even become the company president.

Chemists in Government

About 10% of all chemists work for government agencies. They may be at one of the national laboratories with special research emphases such as the atmosphere, chemical warfare, nuclear

energy or space. They may be involved in setting standards and regulations or in testing to ensure compliance with standards in cosmetics, drugs or foods. Environmental protection at all levels of government is a growing area in need of chemists. Police and fire departments rely more and more on forensic chemistry.

Chemists in Education

More than 20% of all chemists are involved in training new chemists and scientists and in informing non-scientists about the place of chemistry in their lives and its importance for society. The latter role is especially pertinent to the high school teacher who probably sees few future renowned chemists but sees many future citizens. For college professors, class makeup shifts toward science majors. Many college and university professors engage in research projects that serve as training grounds for their students. Although salaries are lower, in general, than those of industrial chemists, chemists in education find rewards in their greater freedom to pursue research, in the variety of activities, and in the pleasure of helping people develop intellectually.

Chemists in Non-Chemical Professions

Frequently, a person with a chemistry major or minor will enter a career not usually considered chemical. With a degree in law, a chemist may become a patent lawyer or deal with environmental protection or product safety laws. Science reporting and technical writing require a good background in chemistry. Science librarians are needed by industries and universities. Many chemistry majors become dentists, pharmacists, physicians or veterinarians.

Major Programs in Chemistry

In this section we describe the various program options in Chemistry. For each option, a general description of the course requirements taken from the current Announcements is listed first. This is followed by semester-by-semester curriculum guides requiring four academic years. The curriculum guide for an option represents the best advice of the Department of Chemistry for efficiently completing a program option. These guides take into account the mistakes many self-advised students have made in the past, especially taking too many science and math courses, or too many laboratory courses in the same semester.

If you faithfully follow this guide and maintain the required GPA, you will automatically meet all of the requirements for graduation. If you must deviate from the suggested curriculum, you should do so only with the advice and consent of your advisor. A Program Checklist to help you chart your progress is included with each program option.

The Department of Chemistry offers Bachelor of Arts (B.A.) and Bachelor of Science (B.S.) degrees. There are currently 5 B.S. Programs.

Two of the B.S. curricula satisfy the guidelines of the American Chemical Society (ACS) for the training of professional chemists, and all graduates with this degree will be certified by the ACS as having completed an approved program. One program is a general preparation for being a chemist, and the second is a general preparation for being a biochemist.

There are three other specialized B.S. degree programs. The first is a specialization in Biochemistry which allows capable students who take the two year "pre-pharmacy" curriculum to graduate with a degree in Chemistry in four years. The next is a specialization in Forensics Chemistry. The B.S. in

Secondary Education leads to certification for teaching high school chemistry. The requirements and courses may change; your advisor will have the most recent information.

Finally, the B.S. program (Basic Specialization) offers more flexibility in required chemistry courses.

The B.A. curriculum has fewer chemistry requirements than the B.S. curriculum and thus is able to accommodate a variety of student goals. There are four B.A. specializations available to you: (a) a flexible, basic program which gives a general introduction to chemistry, and which is supplemented by electives in chemistry or other fields; and (b) three more structured programs which provides pre-professional training for the medical science professions, forensics and biochemistry. The latter two currently require 134 or more credit hours, and are under review by the department. The degree requirements which follow are in addition to the graduation requirements of the University and the College of Arts and Sciences which are listed in Appendix II.

Special Areas in Chemistry

The previous section classifies Chemistry by career areas that chemists may pursue. The following section classifies Chemistry into five major areas of concentration:

- 1) Physical Chemists** measure and study the physical properties of substances and try to explain them through mathematically stated theories. A growing subset called **Computational Chemists** model chemical behavior with computers.
- 2) Organic Chemists** study compounds composed largely of carbon, determine properties and reactions, develop new methods of preparation and seek new compounds to meet specific needs.
- 3) Inorganic Chemists** study compounds of all elements other than carbon, with goals similar to those of organic chemists.
- 4) Analytical Chemists** determine the composition of substances and the concentration of mixtures. Sophisticated instrumental techniques, often coupled with computer control and automatic tabulation of data, have replaced many of the traditional "bench" methods.
- 5) Biochemists** overlap with biologists and study the chemical processes in living things, which often involve large and complex organic compounds.

Many chemists work at intersections of these broad areas, such as bio-inorganic chemistry, or at intersections with other sciences, such as chemical physics or environmental chemistry. The undergraduate chemistry student usually does not specialize, but will take at least one course in each of the five major areas.

Undergraduate Research

Undergraduate research is your opportunity to work with a faculty member in a professional research lab setting to acquire skills specific to your career goals through a defined, ongoing research program. The Department offers credit hours in Chemistry 296, 396, 496, 596, and 597 for research experiences which count toward degrees in Chemistry.

A common question is "How do I choose a research advisor?" This is a question that your assigned mentor can help you with. It helps to have an idea of what your eventual career goals are, so you can choose an area (physical, organic, inorganic, analytical, biochemistry, education etc) that will allow you to narrow your search down to a smaller group of faculty. Once you know who is doing research in your area of interest, go ask them about their research, and feel free to talk to students already in their group. Once you find an faculty member with whom you can work, ask to join her/his research

group. At that point the faculty member will advise you on registration for research hours, and will be a valuable mentor during the rest of your time at SIUE.

Educational Preparation

In high school, you should take the strongest college preparatory program that you can. Communication skills are essential, speech as well as grammar and composition. Scientists must use language precisely and properly to exchange information accurately. Math through trigonometry is basic, as are one year of biology, chemistry and physics. Social sciences and a foreign language will round out your general background. You should be prepared to take, in your first term at college, calculus and the University-level chemistry course. At SIUE, students take organic chemistry after their first-year general chemistry course. To apply for formal acceptance as a chemistry major, students must have at least a "C" average in all courses, including electives.

Faculty

All Chemistry faculty at SIUE hold the Ph.D. degree and are active in scholarly research and writing. Most have received outside grants in support of their research, and all have published articles in professional journals. Several are active in professional societies, locally, statewide and nationwide. More detail is available at <http://www.siue.edu/artsandsciences/chemistry>

Scholarships and Awards

While no special scholarships are reserved for students pursuing a major in Chemistry, SIUE's Office of Student Work and Financial Assistance administers several federal, state and institutional financial aid programs, including scholarships, grants and loans. Early application is advised. In addition, the Chemistry Department hires several student workers to tutor and help prepare for teaching labs. This provides an excellent opportunity for first-hand experience in chemistry. Stipends for summer research projects and cash prizes are available for students who excel in Chemistry at SIUE.

Graduate Study

The Department of Chemistry offers a Master's degree and typically has about 35 active graduate students. A student may seek this degree to prepare for an industrial position at a higher level than that usually available to one who holds a bachelor's degree. Others may wish to acquire a specialty in Chemistry or to try graduate work before deciding to seek the doctor's degree. The Master's thesis usually is based on laboratory research carried out under the direction of a professor. More information is available at:

<http://www.siue.edu/graduatestudents/catalog/ch2/chemistry.shtml>

Facilities

In addition to the well-equipped laboratories for undergraduate teaching, the SIUE research labs also are available to upper-class majors for carrying out independent projects. The Chemistry Department enjoys significant support, both from within and outside the University, in developing and maintaining its inventory of specialized equipment used for instruction and research. Some of the Department's more specialized and/or major items include:

- Bruker Ascend 400 MHz NMR Spectrometer w/Broadband Capability, Auto Sampler, & Variable Temp. Unit
- Bruker EMXPlus X-Band EPR Spectrometer
- Agilent (Varian) 450-GC with Varian 220MS GC/MS (ion trap technology)
- Shimadzu GC-2010 plus Gas Chromatograph with FID and TCD detectors

- Agilent 1200 Series HPLC with UV-Vis detection, reverse phase
- Shimadzu CBM-20A "Prominence" series HPLC with UV-Vis detection, reverse phase
- Agilent (Varian) 212LC with Varian 310-MS LC/MS system
- Thermo Nicolet iS50 FTIR spectrometer, (high resolution)
- Perkin-Elmer LS 55 Fluorescence Spectrophotometer
- Agilent 200 Series Flame Atomic Absorption Spectrophotometer
- Agilent 200 Series Atomic Absorption Spectrophotometer with GTA120 Graphite Tube Atomizer
- Perkin-Elmer Lambda 45 UV-VIS Spectrophotometer
- Bruker Hyperion 3000 FTIR microscope with Bruker Vertex-70 FTIR
- Bruker Senterra Raman microscope with both dispersive (785 nm, 532 nm) and FT (1064 nm) detection and fiber-optic capabilities.
- Veeco Scanning Tunneling Microscope & Atomic Force Microscope
- Mettler TGA/DSC-1 STAR^e System Thermogravimetric/Differential Scanning Calorimeter
- Rigaku Miniflex Powder X-Ray Diffractometer
- TA Instruments nano-ITC Isothermal Titration Calorimeter
- General Electric Microcal VP-DSC Differential Scanning Calorimeter
- General Electric Microcal VP-ITC Isothermal Titration Calorimeter
- 4°C Cold Room with Bio-Cold Environmental Controls
- Bio-Rad ChemiDoc MP Gel Imaging System
- General Electric AKTA Prime plus Fast Protein Liquid Chromatography system
- LABGARD Class II Type A2 Biological Safety Cabinet
- Sorvall RC 5B Plus Centrifuge
- New Brunswick Scientific I26 Incubator-Shaker
- Several Buchi R-210 Rotary Evaporators
- Jasco P-2000 polarimeter
- Five StellarNet "Black Comet" Fiber-optic UV-VIS spectrometers
- Digital Potentiostats, & other Electroanalytical Apparatus
- Electrophoresis System
- Computer Lab w/Mac's & PC's for Chemical Visualization/Molecular Modeling & other Calculations
- Various other UV-VIS Spectrophotometers, Gas Chromatographs, HPLCs, Vacuum Atmospheres Drybox, MBRAUN Solvent drying system and other apparatus for working under an Inert Atmosphere
- Hollow Cathode Sputter Source, Argon ion Laser (Lexel 95), Conjugated Dye Laser (Lexel 350)

The department presently has a small computer lab, and also the extensive computer facilities of the University are available to Chemistry students. The University's Lovejoy Library receives the major chemical journals and has large holdings of reference monographs and advanced textbooks.

Student Services

The Chemistry Office is located in room SLW 3105 (phone 618-650-2042). If you have a problem with almost anything, an inquiry at the office is the best way to begin to solve it. The following are a few of the other services and activities of the department that are primarily of interest to undergraduate students.

Advisement

Undergraduate students are assigned faculty mentors as soon as they declare a major in Chemistry. You should receive this information by e-mail from the Department. General Education advising is performed through the CAS advising office. You should plan to meet with your mentor each semester to review your progress in advance of your meeting with CAS advising to plan your schedule for the following semester. Your mentor is available at other times as well to help you

decide your career goals or solve other problems. **Appointments can be made with the mentor directly.** If you do not know who your mentor is, call the Chemistry office at 618-650-2042.

Students who are not Chemistry majors may receive advice through the CAS Advising. This office maintains files of career information and brochures from many graduate schools. Graduate School recruitment posters from various schools are posted on bulletin boards on the third floor of the Science Laboratory Building West.

Undergraduate Bulletin Board

Notices of general interest to undergraduates are posted on a bulletin board in the hall next to the Chemistry Office.

Research and Job Opportunities

There are many opportunities for student work in departmental research labs on faculty research projects. Students usually undertake research for academic credit, but some professors may have funds available to hire student laboratory workers. Some students work in the research laboratories without course enrollment or pay, simply because they enjoy it. A limited number of senior Chemistry majors are employed as assistants in undergraduate teaching laboratories; a few are employed as student tutors or stockroom assistants.

Tutoring

Tutoring is available at no charge through the Department of Chemistry. Check with your instructor for hours and location. Tutoring services are also available through the Student Success Center. A schedule of tutoring is posted on the Department's website and is updated early each semester. <http://www.siu.edu/artsandsciences/chemistry/tutoring.shtml>.

Computers

The department shares some computational facilities with other departments. Departmental computers are located in SLW 2290 and in several of the chemistry laboratories.

Awards

The department makes a number of awards for academic excellence to undergraduate Chemistry majors. These include the Freshman Award in Chemistry, the Senior Student Award in Chemistry, the Junior Chemistry Student Award, the Undergraduate Award in Analytical Chemistry (American Chemical Society), Outstanding Senior Student in Chemistry, and the Sigma-Aldrich Co-Op Scholarship. Nominations for these awards are made by faculty from lists of eligible students. The awardees are determined by a faculty committee in early spring.

Student Affiliate (ACS Chem Club)

The ACS Chem Club is open to students with an interest in chemistry. The Chem Club sponsors a variety of social, career, and service activities in the Department of Chemistry. The club is the SIUE chapter of the Student Affiliate of the American Chemical Society. Each year's organizational meeting is announced in the fall semester. You should make every effort to become active in this important student organization. Please take time to visit their Facebook page: <https://www.facebook.com/groups/7762208932/>

Probst Lecture

This annual event in memory of William J. Probst, a former member of the Chemistry faculty, is usually scheduled in the spring. The lecture series has attracted many notable scientists among them Nobel Laureates, Roald Hoffman, William J. Lipscomb, Dr. Carl Djerassi, Dr. Robert Curl, Dr.

Jacqueline Barton, and Dr. Christopher C, Cummins. All Chemistry students are encouraged to attend the lectures many of our alumni consider to be a "homecoming". Current information about Probst lecture is available on the Chemistry website:

<http://www.siue.edu/artsandsciences/chemistry/probst.shtml>.

Departmental Academic Standards for All Chemistry Programs

In addition to University and College of Arts and Sciences requirements (Appendix II), the following academic standards should be met by all Chemistry majors:

1. Grades of "C" or better in CHEM 121a and CHEM 121b are required of all Chemistry majors before proceeding into any chemistry courses numbered above 199. Transfer students, upper-division students and others who have not earned a grade of "C" or better in CHEM 121 will be required to do so as a condition for being accepted as a major in Chemistry.
2. No more than 8 semester hours of "D" in any science or mathematics courses may be counted toward a major in Chemistry.

Goals for Baccalaureate Students in Chemistry:

- 1) Manifest an understanding of those fundamental chemical principles and practices suggested by the American Chemical Society Committee on Professional Training.
- 2) Demonstrate the applicability of chemical principles and practices in the study and understanding of other fields while recognizing the unifying aspects of knowledge regardless of fields.
- 3) Be prepared for graduate study in Chemistry and/or related professional fields.
- 4) Be able to compete successfully for entry-level employment in chemistry or related areas.
- 5) Be able to communicate orally and in writing about the impact of chemistry in society, historical advances in chemistry, and ethical issues in chemistry.

The **Senior Assignment** (Chem 499) is an opportunity for the department to assess how well these goals are met. All majors must complete:

- Students are required to present a poster (with a 10-15 minute oral presentation and defense) or a PowerPoint presentation.
- Students are encouraged to present results from their own research projects. Otherwise topics from the chemical literature may be presented.
- All topics are pre-approved by the instructor and/or the Student Standards and Assessment Committee.
- All students are expected to do library work and gather and evaluate the information obtained.
- All departmental faculty are responsible for evaluating the resulting projects.
- CHEM 499 (Senior Assignment) for zero credit hours is required for graduation.

SUGGESTED CURRICULUM GUIDES

List of Abbreviations

BIOL	Biology
CHEM	Chemistry
CHEM ELECT	Chemistry Electives
CI	Curriculum & Instruction
CS	Computer Science
ELECT	General Electives

ENG	English
EPFR	Educ, Psych, Foundations & Research
FL	Foreign Language
GEN ED	General Education
IS	Interdisciplinary
SCI	Science
SPC	Speech Communication
SPE	Special Education
STAT	Statistics

Bachelor of Science in Chemistry - American Chemical Society (ACS) Certified Specialization

The Bachelor of Science degree does not require a minor.

General Education Requirements not covered under Requirements below	30
<p>The General Education Curriculum (Lincoln Plan) requires credit in the categories called <u>Foundations</u>, <u>Breadth</u>, <u>Interdisciplinary Studies</u>, and <u>Experiences</u>. More details are in Appendix II. A student would consult with the faculty mentor and the CAS advisor to make sure the General Education Requirements are fulfilled. See: http://www.siu.edu/registrar/genedguides.shtml for worksheets.</p>	
Chemistry Requirements	49
Chemistry 121a,b	8
Chemistry 125a,b	2
Chemistry 241a,b	6
Chemistry 245	2
Chemistry 300	1
Chemistry 331	3
Chemistry 335	1
Chemistry 361a,b	6
Chemistry 365a,b	3
Chemistry 411	3
Chemistry 415	2
Chemistry 431	3
Chemistry 435	1
Chemistry 451a	3
Chemistry 499	0
Additional 3 semester hours from one of the following chemistry courses: CHEM 419, 439, 441, 444, 449, 451b (or BIOL 430b), 459, 469, 471, 479.....	3
Additional 2 semester hours from one of the following chemistry courses: CHEM 396, 455, 496.....	2
Mathematics Requirements	10
Mathematics 150	5
Mathematics 152.....	5
Computer Science Requirement	3-4
One of CS140 or 141 or STAT 107, 244, 380, or 480.....	3
Physics Requirements	10
Physics 151 and 151L	8
Physics 152 and 152L	2
Electives to complete required total of 120	18-19
Minimum Required	120

Students planning to major in Chemistry (ACS degree) should begin their Math and Chemistry courses as soon as possible in the freshman year in order to complete the degree in four years.

Recommended "out of department" electives (choose according to interests and career goals):

Math: Calculus 3, Differential Equations, Engineering Mathematics, Statistics (Math 480)

Biology: Cell & Molecular, Genetics, Immunology, Microbiology, Recombinant DNA, BIO 431

Physics: Modern Physics, Optics, Light & Color

Computer Science: 150,151,404

Other: Scientific Drawing, Economics, Accounting, GBA 300, Management, Environmental Geochemistry, Graphical Information Systems, Finance, Foreign Languages, History of Chemistry, more Communications

Sample Curriculum for Bachelor of Science in Chemistry
American Chemical Society (ACS) Certified Specialization

Fall Semester		Spring Semester	
Year 1		Year 1	
CHEM 121a – General Chemistry (BPS)	4	CHEM 121b – General Chemistry (BPS)	4
CHEM 125a – General Chemistry Lab (EL)	1	CHEM 125b – General Chemistry Lab (EL)	1
ENG 101 – Composition (FRSM)	3	ENG 102 – Composition	3
MATH 150 – Calculus I (BPS)	5	MATH 152 – Calculus II (BPS)	5
SPC 103 – Interpersonal Communication (BICS, EUISC)	3	RA 101 – Reasoning and Argumentation	3
Total	16	Total	16
Year 2*		Year 2	
CHEM 331 – Quantitative Analytical Chemistry	3	CHEM 241b – Organic Chemistry (BPS)	3
CHEM 335 – Quantitative Analytical Chem Lab	1	CHEM 245 – Organic Chemistry Lab (EL)	2
CHEM 241a – Organic Chemistry	3	CS 140 or STAT 107, 244, 380, or 480	3-4
PHYS 151 – University Physics (BPS)	4	PHYS 152 – University Physics (BPS)	4
PHYS 151L – University Physics Lab (EL)	1	PHYS 152L – University Physics Lab (EL)	1
Fine & Performing Arts (BFPA)	3	Life Science (BLS)	3
Total	15	Total	16
Year 3		Year 3	
CHEM 300 – Professionalism in Science	1	CHEM 361b – Physical Chemistry	3
CHEM 361a – Physical Chemistry	3	CHEM 365b – Physical Chemistry Lab	1
CHEM 365a – Physical Chemistry Lab	2	CHEM Elective	3
CHEM 451a*** – Biochemistry	3	Social Sciences (BSS) / Global Culture (EGC)	3
Humanities (BHUM)	3	Elective	3
Interdisciplinary Studies (IS)	3	Total	13
Total	15		
Year 4		Year 4	
CHEM 411 – Inorganic Chemistry	3	CHEM 431 – Instrumental Analysis	3
CHEM 415 – Inorganic Chemistry Lab	2	CHEM 435 – Instrumental Analysis Lab	1
Elective	3	CHEM 499 – Senior Assignment	0
Elective	3	CHEM Elective	2
Elective	3	Health Experience (EH)	3
Total	14	Elective	3
		Elective	3
		Total	15

*This is a fairly difficult semester. Many students elect to take 331 & 335 either in the summer before or the summer after their 2nd Year. If you do so, you may want to put an elective here. Others choose to make Year 3 the tough one by postponing 331.

***CHEM 451a,b may be postponed to Year 4. Substitute CHEM ELECT or CHEM 331, if not already completed.

CHEM ELECTS must total at least 3 senior-level lecture hours and 2 advanced lab hours. You have lots of flexibility as to scheduling GEN ED's, ELECT's, and CHEM ELECT's. However most CHEM ELECT's have extensive prerequisites; none are offered every semester, and some will not be offered every year. CHEM 496 (research) is highly recommended for some of the elective hours.

Bachelor of Science in Chemistry, American Chemical Society (ACS) Certified Specialization in BioChemistry

General Education Requirements not covered under Requirements below..... 27

The General Education Curriculum (Lincoln Plan) requires credit in the categories called Foundations, Breadth, Interdisciplinary Studies, and Experiences. More details are in Appendix II. A student would consult with the faculty mentor and the CAS advisor to make sure the General Education Requirements are fulfilled. See: <http://www.siu.edu/registrar/genedguides.shtml> for worksheets.

Chemistry Requirements..... 56

Chemistry 121 a,b	8
Chemistry 125 a,b	2
Chemistry 241 a,b	6
Chemistry 245	2
Chemistry 300	1
Chemistry 331	3
Chemistry 335	1
Chemistry 361 a,b	6
Chemistry 365 a,b	3
Chemistry 396	2
Chemistry 411	3
Chemistry 415	2
Chemistry 431	3
Chemistry 435	1
Chemistry 451 a&b.....	6
Chemistry 455	2
Chemistry 459	3
Chemistry 496	2
Chemistry 499	0

Biology Requirements..... 16

Biology 150.....	4
Biology 151.....	4
Biology 220.....	4
Biology 319.....	4

Mathematics Requirements..... 10

Mathematics 150.....	5
Mathematics 152.....	5

Computer Science or Statistics Requirements..... 3

STAT 244, 380	3
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Physics Requirements..... 10

Physics 151 / 152.....	8
Physics 151L / 152L.....	2

Minimum Total Credit Hours Required..... 123

Students admitted to a health professions school at the end of their junior year may transfer appropriate health professions school credits to complete the requirements for a degree in Chemistry from SIUE

**Sample Curriculum for the Bachelor of Science in Chemistry,
American Chemical Society (ACS) Certified Specialization in BioChemistry**

Fall Semester		Spring Semester	
Year 1		Year 1	
CHEM 121a – General Chemistry I (BPS)	4	CHEM 121b – General Chemistry II (BPS)	4
CHEM 125a – General Chemistry Lab I (EL)	1	CHEM 125b – General Chemistry Lab II (EL)	1
ENG 101 – Composition I (FRSM)	3	ENG 102 – Composition II	3
MATH 150 – Calculus I (BPS)	5	MATH 152 – Calculus II (BPS)	5
SPC 103 – Interpersonal Communication (BICS, EUSC)	3	BIOL 150 – Intro to Biol. Sciences I (BLS, EL)	4
Total	16	Total	17
Year 2		Year 2	
CHEM 241a – Organic Chemistry I (BPS)	3	CHEM 241b – Organic Chemistry II (BPS)	3
CHEM 331 – Quant Analytical Chemistry	3	CHEM 245 – Organic Chemistry Lab (EL)	2
CHEM 335 – Quant Analytical Chemistry Lab	1	PHYS 152 – University Physics II (BPS)	4
PHYS 151 – University Physics I (BPS)	4	PHYS 152L – University Physics Lab II (EL)	1
PHYS 151L – University Physics Lab I (EL)	1	BIOL 220 – Genetics (BLS, EL)	4
BIOL 151 – Intro to Biol. Sciences II (BLS, EL)	4	RA 101 – Reasoning and Argumentation	3
Total	16	Total	17
Year 3		Year 3	
CHEM 300 – Professionalism in Science	1	CHEM 361b – Physical Chemistry	3
CHEM 361a – Physical Chemistry	3	CHEM 365b – Physical Chemistry Lab	1
CHEM 365a – Physical Chemistry Lab	2	CHEM 396 – Introduction to Research	2
CHEM 451a – Biochemistry	3	CHEM 451b – Biochemistry	3
BIOL 319 – Cell & Molecular Biology	4	CHEM 455 – Experimental Methods in Biochemistry	2
Fine & Performing Arts (BFPA)	3	Humanities (BHUM)	3
Total	16	Total	14
Year 4		Year 4	
CHEM 411 – Inorganic Chemistry	3	CHEM 431 – Instrumental Analysis	3
CHEM 415 – Inorganic Chemistry Lab	2	CHEM 435 – Instrumental Analysis Lab	1
CHEM 451c – Biochemistry	3	CHEM 499 – Senior Assignment	0
CHEM 496 – Chemical Problems	2	Health Experience (EH)	3
CS 140 or STAT 107, 244, 380,(BICS) or 480	3-4	Social Sciences (BSS)/ Global Culture (EGC)	3
Total	13-14	Interdisciplinary Studies (IS)	3
		Total	13

Total Credit Hours = 123 to 124 with 95 required hours in Math and the Science

Bachelor of Science in Chemistry, Biochemistry Specialization

This degree was designed to allow students who have taken two years of the pre-pharmacy curriculum to graduate in a total of 4 years with a degree in chemistry

General Education Requirements not covered under Requirements below 27

The General Education Curriculum (Lincoln Plan) requires credit in the categories called Foundations, Breadth, Interdisciplinary Studies, and Experiences. More details are in Appendix II. A student would consult with the faculty mentor and the CAS advisor to make sure the General Education Requirements are fulfilled. See: <http://www.siu.edu/registrar/genedguides.shtml> for worksheets.

Chemistry Requirements 53

Chemistry 121 a,b	8
Chemistry 125 a,b	2
Chemistry 241 a,b	6
Chemistry 245	2
Chemistry 300	1
Chemistry 331	3
Chemistry 335	1
Chemistry 410	3
Chemistry 431	3
Chemistry 435	1
Chemistry 451a,b,c	9
Chemistry 455	2
Chemistry 461a,b	6
Chemistry 465	2
Chemistry 499	0

Additional 4 hours from:

Chem 396, 496, 446, 449, 471, 479, 459 or Biol 456.....	4
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Biology Requirements 16

Biology 150.....	4
Biology 151.....	4
Biology 220.....	4
Biology 319.....	4

Mathematics Requirements 5

Mathematics 150.....	5
[OR Mathematics 145	5]

Computer Science or Statistics Requirements 3

STAT 244, 380	3
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Physics Requirements 10

Physics 151/151L and Physics 152/152L.....	10
OR Physics 131 a&b	10

Electives 6

Minimum Total Credit Hours Required 120

Students admitted to a health professions school at the end of their junior year may transfer appropriate health professions school credits to complete the requirements for a degree in Chemistry from SIUE

**Sample Curriculum for Bachelor of Science in Chemistry,
Biochemistry Specialization**

Fall Semester		Spring Semester	
Year 1		Year 1	
CHEM 121a – General Chemistry (BPS)	4	BIOL 150 – Intro to Biol. Sciences I (BLS, EL)	4
CHEM 125a – General Chemistry Lab (EL)	1	CHEM 121b – General Chemistry (BPS)	4
ENG 101 – Composition (FRSM)	3	CHEM 125b – General Chemistry Lab (EL)	1
SPC 103 – (BICS, EUSC)	3	ENG 102 – Composition	3
RA 101 - Reasoning and Argumentation	3	MATH 150 – Calculus (BPS) (or Math 145)	5
Elective	3	Total	17
Total	15		
Year 2		Year 2	
BIOL 151 – Intro to Biol. Sciences II (BLS, EL)	4	CHEM 241b – Organic Chemistry (BPS)	3
CHEM 241a – Organic Chemistry	3	CHEM 245 – Organic Chemistry Lab	2
PHYS 131a – College Physics	5	PHYS 131b – College Physics	5
Social Sciences (BSS)/ Global Culture (EGC)	3	Health Experience (EH)	3
Total	15	Elective	3
		Total	16
Year 3		Year 3	
BIOL 220 – Genetics (BLS, EL)	4	BIOL 319 – Cell & Molecular Biology	4
CHEM 300 – Professionalism in Science	1	CHEM 451b – Biochemistry	3
CHEM 331 – Quant Analytical Chemistry	3	CHEM 455 –Biochem Lab	2
CHEM 335 – Quant Analytical Chemistry Lab	1	STAT 244 – Statistics (BICS)	4
CHEM 451a – Biochemistry	3	Fine& Performing Arts (BFPA)	3
Interdisciplinary Studies (IS)	3	Total	16
Total	15		
Year 4		Year 4	
Humanities (BHUM)	3	CHEM 410 – BioInorganic Chemistry	3
CHEM 451c – Biochemistry	3	CHEM 461b – BioPhysical Chemistry	3
CHEM 461a – BioPhysical Chemistry	3	CHEM 431 – Instrumental Analysis	3
CHEM 465a – BioPhysical Chemistry Lab	2	CHEM 435 – Instrumental Analysis Lab	1
Chemistry Elective	2	CHEM 499 – Senior Assignment	0
Total	13	Chemistry Elective	2
		Total	12

Bachelor of Science in Chemistry, Forensics Chemistry Specialization

General Education Requirements not covered under Requirements below	27
<p>The General Education Curriculum (Lincoln Plan) requires credit in the categories called <u>Foundations</u>, <u>Breadth</u>, <u>Interdisciplinary Studies</u>, and <u>Experiences</u>. More details are in Appendix II. A student would consult with the faculty mentor and the CAS advisor to make sure the General Education Requirements are fulfilled. See: http://www.siu.edu/registrar/genedguides.shtml for worksheets.</p>	
Chemistry Requirements	48
Chemistry 121 a,b	8
Chemistry 125 a,b	2
Chemistry 241 a,b	6
Chemistry 245	2
Chemistry 300	1
Chemistry 331	3
Chemistry 335	1
Chemistry 361 a,b	6
Chemistry 365 a,b	3
Chemistry 431	3
Chemistry 435	1
Chemistry 439	3
Chemistry 451a	6
Chemistry 471	3
Chemistry 499	0
Biology Requirements	16
Biology 150.....	4
Biology 151.....	4
Biology 220.....	4
Biology 319.....	4
Environmental Science Requirements	4
ENSC 428/428L	4
Mathematics Requirements	10
Mathematics 150.....	5
Mathematics 152.....	5
Computer Science or Statistics Requirements	3
STAT 244, 380	3
Physics Requirements	10
Physics 151 and 152	8
Physics 151L and 152L	2
Electives (consider Chem 396/496).....	2
Minimum Total Credit Hours Required	120
<p>Students admitted to a health professions school at the end of their junior year may transfer appropriate health professions school credits to complete the requirements for a degree in Chemistry from SIUE</p>	

**Sample Curriculum for Bachelor of Science in Chemistry,
Forensics Chemistry Specialization**

Fall Semester		Spring Semester	
Year 1		Year 1	
CHEM 121a – General Chemistry I (BPS)	4	CHEM 121b – General Chemistry II (BPS)	4
CHEM 125a – General Chemistry Lab I (EL)	1	CHEM 125b – General Chemistry Lab II (EL)	1
ENG 101 – Composition I (FRSM)	3	ENG 102 – Composition II	3
MATH 150 – Calculus I (BPS)	5	MATH 152 – Calculus II	5
SPC 103 - (BICS, EUSC)	3	BIOL 150 - Intro to Biological Science I (BLS)	4
Total	16	RA 101 Reasoning and Argumentation	3
		Total	17
Year 2		Year 2	
CHEM 241a Organic Chemistry I (BPS)	3	CHEM 241b – Organic Chemistry II (BPS)	3
CHEM 331 – Quant Analysis Chemistry	3	CHEM 245 – Organic Chemistry Lab (EL)	2
CHEM 335 – Quant Analysis Chem Lab	1	PHYS 152 – University Physics II (BPS)	4
PHYS 151 - University Physics I (BPS)	4	PHYS 152L - University Physics Lab II (EL)	1
PHYS 151L – University Physics Lab I (EL)	1	BIOL 220 - Genetics	4
BIOL 151 - Intro to Biol Science II (BLS, EL)	4	Total	14
Total	16		
Year 3		Year 3	
CHEM 300 – Professionalism in Science	1	CHEM 361b - Physical Chemistry	3
CHEM 361a – Physical Chemistry	3	CHEM 365b - Physical Chemistry Lab	1
CHEM 365a – Physical Chemistry Lab	2	BIOL 490 - Forensics Biology	3
CHEM 451a - Biochemistry	3	Health Experience (EH)	3
BIOL 319 - Cell & Molecular Biology	4	Fine & Performing Arts (BFPA)	3
Total	13	Elective	2
		Total	14
Year 4		Year 4	
CHEM 471	3	CHEM 431 - Instrumental Analysis	3
ENSC 428 - Environmental Analysis	3	CHEM 435 - Instrumental Analysis Lab	2
ENSC 428L - Environmental Analysis Lab	1	CHEM 499 - Senior Assignment	0
STAT 244 or 380 (BICS)	3-4	CHEM 439 - Forensics Chemistry	3
Social Sciences (BSS)/ Global Culture (EGC)	3	Humanities (BHUM)	3
Total	13-14	Interdisciplinary Studies (IS)	3
		Total	16

Bachelor of Science in Chemistry Basic Specialization

The Bachelor of Science degree does not require a minor.

General Education Requirements not covered under Requirements below	30
<p>The General Education Curriculum (Lincoln Plan) requires credit in the categories called <u>Foundations</u>, <u>Breadth</u>, <u>Interdisciplinary Studies</u>, and <u>Experiences</u>. More details are in Appendix II. A student would consult with the faculty mentor and the CAS advisor to make sure the General Education Requirements are fulfilled. See: http://www.siue.edu/registrar/genedguides.shtml for worksheets.</p>	
Chemistry Requirements	45
Chemistry 121a,b	8
Chemistry 125a,b	2
Chemistry 241a,b	6
Chemistry 245	2
Chemistry 300	1
Chemistry 331	3
Chemistry 335	1
Chemistry 361a,b	6
Chemistry 365a,b	3
Chemistry 411	3
Chemistry 499	0
Additional 6 semester hours from two of the following Chemistry courses: CHEM 419, 431, 439, 441, 444, 449, 451a, 451b, 459, 469, 471, 479.....	6
Additional 3 semester hours from one of the following Chemistry courses: CHEM 396, 415, 435, 455, 496.....	3
Mathematics Requirements	10
Mathematics 150	5
Mathematics 152	5
Computer Science Requirements	3
One of CS140, 141 or STAT 107, 244, 380, 480	3
Physics Requirements	10
Physics 151/152	8
Physics 151L/152L	2
Electives to Complete	22
Minimum Total Semester Hours Required	120

Recommended "out of department" electives (choose according to interests and career goals):

Math: Calculus 3, Differential Equations, Engineering Mathematics, Statistics (Math 480)

Biology: Cell & Molecular, Genetics, Immunology, Microbiology, Recombinant DNA, BIOL 431

Physics: Modern Physics, Optics, Light & Color

Computer Science: 150,151,404

Other: Scientific Drawing, Economics, Accounting, GBA 300, Management, Environmental Geochemistry, Graphical Information Systems, Finance, Foreign Languages, History of Chemistry, more communications

Sample Curriculum for the Bachelor of Science in Chemistry
Basic Specialization

Fall Semester		Spring Semester	
Year 1		Year 1	
CHEM 121a – General Chemistry I (BPS)	4	CHEM 121b – General Chemistry II (BPS)	4
CHEM 125a – General Chemistry Lab I (EL)	1	CHEM 125b – General Chemistry Lab II (EL)	1
ENG 101 – English Composition I (FRSM)	3	ENG 102 – English Composition II	3
MATH 150 – Calculus I (BPS)	5	MATH 152 – Calculus II (BPS)	5
SPC 103 (BICS, EUSC)	3	RA 101 Reasoning and Argumentation	3
Total	16	Total	16
Year 2*		Year 2	
CHEM 241a – Organic Chemistry (BPS)	3	CHEM 241b – Organic Chemistry (BPS)	3
CHEM 331 – Quant Analytical Chemistry	3	CHEM 245 – Organic Chemistry Lab.(EL)	2
CHEM 335 – Quant Analytical Chem Lab	1	CS 140 or STAT 107, 244, 380, or 480	3-4
PHYS 151 – University Physics (BPS)	4	PHYS 152 – University Physics (BPS)	4
PHYS 151L – University Physics Lab (EL)	1	PHYS 152L – University Physics Lab (EL)	1
Fine & Performing Arts (BFPA)	3	Life Science (BLS)	3
Total	15	Total	16-17
Year 3		Year 3	
CHEM 300 – Professionalism in Science	1	CHEM 361b – Physical Chemistry	3
CHEM 361a – Physical Chemistry	3	CHEM 365b – Physical Chemistry Laboratory	1
CHEM 365a – Physical Chemistry Lab	2	CHEM Elective	3
Humanities (BHUM)	3	Social Sciences (BSS)/ Global Culture (EGC)	3
Elective	3	Health Experience (EH)	3
Elective	3	Elective	3
Total	15	Total	16
Year 4		Year 4	
CHEM 411 – Inorganic Chemistry	3	CHEM 499 – Senior Assignment 0	
CHEM Elective	3	CHEM Elective	3
Interdisciplinary Studies (IS)	3	Elective	3
Elective	3	Elective	3
Elective	2	Elective	3
Total	14	Total	12

* This is a fairly difficult semester. Many students elect to take 331 & 335 either in the summer before or the summer after their 2nd Year. If you do so, you may want to put an elective here. Others choose to make year three the tough one by postponing 331.

CHEM ELECTS must total at least 6 senior-level lecture hours and 3 advanced lab hours. You have lots of flexibility as to scheduling GEN ED'S, ELECT's, and CHEM ELECT's. However most CHEM ELECT's have extensive prerequisites; none are offered every semester, and some will not be offered every year. CHEM 496 (research) is highly recommended for some of the elective hours.

Bachelor of Science Degree in Chemistry Secondary Education Certification, Grades 6-12

General Education Requirements not covered under Requirements below	30
<p>The General Education Curriculum (Lincoln Plan) requires credit in the categories called <u>Foundations</u>, <u>Breadth</u>, <u>Interdisciplinary Studies</u>, and <u>Experiences</u>. More details are in Appendix II. A student would consult with the faculty mentor and the CAS advisor to make sure the General Education Requirements are fulfilled. See: http://www.siu.edu/registrar/genedguides.shtml for worksheets.</p>	
Chemistry Requirements	37
Chemistry 121a,b	8
Chemistry 125a,b	2
Chemistry 241a,b	6
Chemistry 245	2
Chemistry 300	1
Chemistry 331	3
Chemistry 335	1
Chemistry 361a	3
Chemistry 365a	2
Chemistry 451a	3
Chemistry 494	3
Chemistry 499	0
Additional 3 semester hours chemistry courses numbered 300 or above.	3
Professional Education Requirements	28
Check with education advisor! These change.	
SCI 451	3
Mathematics Requirements	10
Mathematics 150	5
Mathematics 152	5
Statistics Requirement	3
Pick one: STAT 107, 244, 380, 480	3
Physics Requirements	10
Physics 151 / 152	8
Physics 151L / 152L or (Physics 131a,b – 10)	2
Biology Requirements	8
Biology 150	4
Biology 151	4
Minimum Total Semester Hours Required	129

¹ Scheduling for the third and fourth years involves coordination between the Chemistry and Secondary Education Departments. Students should contact the Office of Science and Mathematics Education for specific program details.

General Education requirements must meet the requirements for teacher certification.

ENG 101; ENG 102; SPC 103, 104, or 105; CS 108, 140, or 141

One literature course; PSYC 111; HIST 200 or 201

POLS 112 (HIST/POLS may also be Constitution requirement);

IS (a course in non-western or third-world culture is required).

A minor, second teaching field, or supporting courses - 12-25 hours - additional coursework is probably required to fulfill this requirement.

Sample Curriculum for the Bachelor of Science Degree in Chemistry
Secondary Education Certification, Grades 6-12

Fall Semester	Spring Semester
Year 1 CHEM 121a – General Chemistry I (BPS) 4 CHEM 125a – General Chemistry Lab I (EL) 1 ENG 101 – English Composition I 3 RA 101- Reasoning and Argumentation 3 Social Science (BSS) – PSYC 111 recommended 3 SPC 103 – (BICS, EUSC) 3 Total 17	Year 1 CHEM 121b – General Chemistry II (BPS) 4 CHEM 125b – General Chemistry Lab II (EL) 1 BIOL 150 – Intro to Biol. Science I (BLS, EL) 4 ENG 102 – English Composition II 3 MATH 150 – Calculus I (BPS) 5 Total 17
Year 2 CHEM 241a – Organic Chemistry I (BPS) 3 BIOL 151 – Intro to Biological Science II 4 MATH 152 – Calculus II (BPS) 5 PHYS 151 – University Physics I (BPS) 4 PHYS 151L – University Physics Lab I (EL) 1 Total 17	Year 2 CHEM 241b – Organic Chemistry II (BPS) 3 CHEM 245 – Organic Chemistry Lab (EL) 2 CI 200 – Introduction to Education 2 PHYS 152 – University Physics II 4 PHYS 152L – University Physics Lab II 1 STAT 107, 244, 380, or 480 3-4 Total 15-16
<i>Complete ICTS Basic Skills Test for Admission to the Teacher Certification Program</i>	
Year 3 CHEM 300 – Professionalism in Science. 1 CHEM 331 – Quantitative Analytical Chemistry 3 CHEM 335 – Analytical Chemistry Lab 1 CHEM 361a – Physical Chemistry 3 CHEM 365a – Physical Chemistry Lab 2 CHEM 451a – Biochemistry 3 Fine & Performing Arts (BFPA) 3 Total 16	Year 3 CHEM Elective 3 GEOG 111 – Intro Geography (recomm, BSS, EGC) 3 IS 335, 336, 363, or 364 (recommended) 3 SCI 451 – Integrated Science 3 Humanities (BHUM) 3 Health Experience (EH) 3 Total 18 <i>Apply for Student Teaching by end of Week 2 (See OCECA Office)</i>
Year 4 CHEM 494 – Secondary Chemistry Teaching Methods 3 CI 315a – Methods of Teaching in Secondary Schools 2 CI 440 – Teaching Reading in Secondary School 3 EPFR 315 – Educational Psychology 3 EPFR 320 – Foundations of Education in a Multicultural Society 3 SPE 400 – The Exceptional Child 3 Total 17 <i>Must pass Content Test before Student Teaching</i>	Year 4 CHEM 499 – Senior Assignment 0 CI 315b – Methods of Teaching in Secondary Schools 2 CI 352 – Student Teaching – Secondary 10 Total 12

Bachelor of Arts in Chemistry Basic Specialization

General Education Requirements not covered under Requirements below	48
<p>The General Education Curriculum (Lincoln Plan) requires credit in the categories called <u>Foundations</u>, <u>Breadth</u>, <u>Interdisciplinary Studies</u>, and <u>Experiences</u>. More details are in Appendix II. A student would consult with the faculty mentor and the CAS advisor to make sure the General Education Requirements are fulfilled. See: http://www.siu.edu/registrar/genedguides.shtml for worksheets.</p>	
Foreign Language	8
Chemistry Requirements	40
Chemistry 121a,b	8
Chemistry 125a,b	2
Chemistry 241a,b	6
Chemistry 245	2
Chemistry 300	1
Chemistry 331	3
Chemistry 335	1
Chemistry 361a	3
Chemistry 365a	2
Chemistry 499	0
Additional 9 semester hours from three of the following chemistry courses: CHEM 361b, 411, 419, 431, 439, 441, 444, 449, 451a, 451b, 469, 471, 479.....	9
Additional 3 semester hours from one of the following chemistry courses: CHEM 365b, 396, 415, 435, 455, 496.....	3
Mathematics Requirements	10
Mathematics 150	5
Mathematics 152	5
Computer Science Requirements	3
one of CS140 or 141 or STAT 107, 244, 380, or 480	3
Physics Requirements	10
Physics 151 / 152	8
Physics 151L / 152L	2
(or Physics 131a,b-10)	
Electives (could include science and/or chemistry courses).....	2
Minimum Total Semester Hours Required	120

Recommended "out of department" electives (choose according to interests and career goals):

Math: Calculus 3, Differential Equations, Engineering Mathematics, Statistics (MATH 480)

Biology: Cell & Molecular, Genetics, Immunology, Microbiology, Recombinant DNA, BIOL 431

Physics: Modern Physics, Optics, Light & Color

Computer Science: 150,151,404

Other: Scientific Drawing, Economics, Accounting, GBA 300, Management, Environmental Geochemistry, Graphical Information Systems, Finance, Foreign Languages, History of Chemistry, more communications

Sample Curriculum for the Bachelor of Arts in Chemistry
Basic Specialization

Fall Semester		Spring Semester	
Year 1		Year 1	
CHEM 121a – General Chemistry I (BPS)	4	CHEM 121b – General Chemistry II (BPS)	4
CHEM 125a – General Chemistry Lab I (EL)	1	CHEM 125b – General Chemistry Lab II (EL)	1
ENG 101 – English Composition I (FRSM)	3	ENG 102 – English Composition II	3
MATH 150 – Calculus I (BPS)	5	MATH 152 – Calculus II (BPS)	5
SPC 103 - (BICS, EUSC)	3	RA 101 Reasoning and Argumentation	3
Total	16	Total	16
Year 2		Year 2	
CHEM 241a – Organic Chemistry I (BPS)	3	CHEM 241b – Organic Chemistry (BPS)	3
CS 140 or STAT 107, 244, 380, or 480	3-4	CHEM 245 – Organic Chemistry Lab. (EL)	2
PHYS 151/151L – University Physics I or PHYS 131a - College Physics I (BPS, EL)	5	PHYS 152/152L – Univ. Physics II or PHYS 131b - College Physics II (BPS, EL)	5
Humanities (BHUM), U.S. Cultures (EUSC)	3	Health Experience (EH)	3
Total	14-15	Fine & Performing Arts or Humanities	3
		Total	16
Year 3		Year 3	
CHEM 300 – Professionalism in Science	1	CHEM Elective	3
CHEM 331 – Quant Analytical Chemistry	3	Foreign Language 102 (EGC)	4
CHEM 335 – Quant Analytical Chem Lab	1	Interdisciplinary Studies (IS)	3
CHEM 361a – Physical Chemistry	3	Fine & Performing Arts or Humanities	3
CHEM 365a – Physical Chemistry Lab	2	Fine & Performing Arts or Humanities	3
Foreign Language 101	4	Total	16
Total	13		
Year 4		Year 4	
CHEM 499 – Senior Assignment	0	CHEM Elective	3
CHEM Elective	3	CHEM Elective	2
Life Science (BLS)	3	Social Science (BSS)	3
Fine & Performing Arts or Humanities	3	Fine & Performing Arts or Humanities	3
Fine & Performing Arts (BFPA)	3	Info & Communication in Society (BICS)	3
Minor/Elective	2	Total	14
Total	14		

CHEM ELECTS must total at least 9 junior/ senior level lecture hours and 3 advanced lab hours. You have lots of flexibility as to scheduling GEN ED'S, ELECT's, and CHEM ELECT's. However most CHEM ELECT's have extensive prerequisites; none are offered every semester, and some will not be offered every year. CHEM 496 (research) is highly recommended for some of the elective hours.

Bachelor of Arts Degree in Chemistry Medical Science Specialization¹

General Education Requirements not covered under Requirements below	39
<p>The General Education Curriculum (Lincoln Plan) requires credit in the categories called <u>Foundations</u>, <u>Breadth</u>, <u>Interdisciplinary Studies</u>, and <u>Experiences</u>. More details are in Appendix II. A student would consult with the faculty mentor and the CAS advisor to make sure the General Education Requirements are fulfilled. See: http://www.siu.edu/registrar/genedguides.shtml for worksheets.</p>	
Foreign Language	8
Chemistry Requirements	40
Chemistry 121a,b	8
Chemistry 125a,b	2
Chemistry 241a,b	6
Chemistry 245	2
Chemistry 300	1
Chemistry 331	3
Chemistry 335	1
Chemistry 361a	3
Chemistry 365a	2
Chemistry 451a,b	6
Chemistry 499	0
Additional 3 semester hours from one of the following Chemistry courses: CHEM 361b, 411, 419, 431, 441, 444, 449, 451a, 471, 479.....	3
Additional 3 semester hours from one of the following Chemistry courses: CHEM 345,345, 365b, 396, 415, 435, 455, 496.....	3
Biology Requirements	10
Biology 150.....	4
6 semester hours from the following biology courses: BIOL 151, 220, 319, 325, 331, 335, 340	6-7
Mathematics Requirements	10
Mathematics 150	5
Mathematics 152.....	5
Computer Science or Statistics Requirements	3
CS 140 or STAT 107, 244, 380, 480.....	3
Physics Requirements	10
Physics 151/ 152	8
Physics 151L / 152L.....	2
(or Physics 131a,b -10)	
Minimum Total Semester Hours Required	120

¹Students admitted to a medical school at the end of their junior year may transfer appropriate medical school credits to complete the requirements for a degree in Chemistry from SIUE.

Sample Curriculum for the Bachelor of Arts in Chemistry
Medical Science Specialization

Fall Semester		Spring Semester	
Year 1		Year 1	
CHEM 121a – General Chemistry (BPS)	4	CHEM 121b – General Chemistry (BPS)	4
CHEM 125a – General Chemistry Lab. (EL)	1	CHEM 125b – General Chemistry Lab (EL)	1
ENG 101 – Composition (FRSM)	3	ENG 102 – Composition	3
MATH 150 – Calculus I (BPS)	5	MATH 152 – Calculus II (BPS)	5
SPC 103 - (BICS, EUSC)	3	RA 101 Reasoning and Argumentation	3
Total	16	Total	16
Year 2		Year 2	
CHEM 241a – Organic Chemistry (BPS)	3	CHEM 241b – Organic Chemistry (BPS)	3
PHYS 151/151L – University Physics I		CHEM 245 – Organic Chemistry Lab (EL)	2
or PHYS 131a - College Physics I (BPS, EL)	5	PHYS 152/152L – Univ. Physics II	
BIOL 150 – Intro to Biol. Science I (BLS, EL)	4	or PHYS 131b - College Physics II (BPS, EL)	5
Fine & Performing Arts (BFPA)	3	Social Science (BSS)	3
CS 140 or STAT 107, 244, 380, or 480	3-4	Fine & Performing Arts or Humanities	3
Total	18-19	Total	16
Year 3		Year 3	
CHEM 300 – Professionalism in Science.	1	CHEM Elective	3
CHEM 331 – Quantitative Analytical Chemistry	3	Foreign Language 102 (EGC)	4
CHEM 335 – Analysis Chemistry Laboratory	1	Fine & Performing Arts or Humanities	3
CHEM 361a – Physical Chemistry	3	BIOL 150 – Intro to Biol. Science I (BLS, EL)	4
CHEM 365a – Physical Chemistry Laboratory	2	Total	14
Foreign Language 101	4		
Health Experience (EH)	2		
Total	16		
Year 4		Year 4	
CHEM 451a – Biochemistry	3	CHEM 451b – Biochemistry	3
Humanities (BHUM)	3	CHEM 499 – Senior Assignment	0
BIOL 220 - Genetics	3	CHEM Elective	3
Interdisciplinary Studies (IS)	3	Fine & Performing Arts or Humanities	3
Total	12	Fine & Performing Arts or Humanities	3
		Total	12

CHEM ELECTS must total at least 3 Junior/ Senior level lecture hours and 3 advanced lab hours. You have lots of flexibility as to scheduling GEN ED'S, and CHEM ELECT'S. However most CHEM ELECT'S have extensive prerequisites; none are offered every semester, and some will not be offered every year. CHEM 496 (research) is highly recommended for some of the elective hours.

Minor in Chemistry Requirements

A minor in chemistry requires 24 hours as follows:

Chemistry 121a,b	8
Chemistry 125a,b	2
Chemistry 241a,b	6
Chemistry 245	2
Additional 6 semester hours Chemistry courses numbered 300 or above	6
Minimum Chemistry Hours Required	24

6 hours must be from SIUE work

CHEM (Chemistry)

113 (3)	Introduction to Chemistry - for Underprepared or Unprepared Students
121a,b (4,4)	General Chemistry
125a,b, (1,1)	General Chemistry Laboratory
241a,b, (3,3)	Organic Chemistry
245 (2)	Organic Chemistry Laboratory
331 (3)	Quantitative Analytical Chemistry
335 (1)	Quantitative Analytical Chemistry Laboratory
351 (3)	Basic Biochemistry
361a,b (3,3)	Physical Chemistry
365a,b (2,1)	Physical Chemistry Laboratory
410 (3)	Bioinorganic Chemistry
411 (3)	Inorganic Chemistry
415 (2)	Inorganic Chemistry Laboratory
431 (3)	Instrumental Analysis
435 (1)	Instrumental Analysis Laboratory
441 (3)	Physical Organic Chemistry
444 (3)	Organic Reactions
445 (2)	
446 (1-2)	Organic Spectral Analysis
451a,b, (3,3)	Biochemistry
455 (2)	Experimental Methods in Biochemistry
461a,b (3,3)	Biophysical Chemistry
465 (2)	Biophysical Chemistry Lab
471 (3)	Principles of Toxicology
499 (0)	Senior Assignment
396 (2)	Introduction to Research
496 (2-4)	Chemical Problems
419 (1-3)	Special Topics in Inorganic Chemistry
439 (1-3)	Special Topics in Analytical Chemistry
449 (1-3)	Special Topics in Organic Chemistry
459 (1-3)	Special Topics in Biochemistry
469 (1-3)	Special Topics in Physical Chemistry
479 (1-3)	Special Topics in Environmental Chemistry

Appendix II: Graduation Requirements

It is your responsibility to meet General Education Requirements: The SIUE General Education requirements (The “Lincoln Plan”) are given below. These requirements should be met if you follow the curriculum guides in the Handbook. The SIUE Undergraduate Catalog is available at: <http://www.siu.edu/registrar/pdf/siue-undergraduate-catalog.pdf>

In order to graduate from Southern Illinois University Edwardsville all students must satisfy the following:

- Grade Point Average: GPA of 2.00 or higher is required for graduation.
- Fulfillment of the Lincoln Plan for General Education, as detailed below and in the undergraduate catalog.

From the 2013-2014 SIUE Undergraduate Catalog pp. 64-64:

Foundations

Written Expression I : English 101 (must complete within first 30 college-level credit hours at SIUE)

Written Expression II: English 102 (must complete within first 45 college-level credit hours at SIUE)
Grades of C or better must be earned in both English 101 and 102.

Oral Expression: Speech Communication 101 or 103 (must complete within first 30 college-level credit hours at SIUE)

Logic/Critical Thinking: Reasoning and Argumentation 101 or Philosophy 207 or 213 (must complete within first 60 college-level credit hours at SIUE)

Quantitative Literacy: Quantitative Reasoning 101 or Mathematics 125 or higher (must complete within first 60 college-level credit hours at SIUE)

Breadth

Fine & Performing Arts: Course designated BFPA

Humanities: Course designated BHUM

Information & Communication: Course designated BICS

Life Sciences: Course designated BLS

Physical Sciences: Course designated BPS

Social Sciences: Course designated as BSS

Interdisciplinary Studies (IS) Course with the prefix IS

Experiences

New Freshman Seminar: Course designated FRSM (For new freshmen)

Laboratory Experience: Course designated EL

United States Cultures: Course or approved project or activity designated EUSC

Global Cultures Experience: Course or approved project or activity designated EGC

Health Experience: Course or approved project or activity designated EH

Senior Assignment: Chemistry 499.

Senior Assignment

Seniors are required to complete a senior assignment that demonstrates academic breadth attained through general education courses and proficiency in their academic majors. This requirement stems from the University's belief that the ability to integrate a general education perspective into one's academic discipline is an essential mark of a University-educated person. Faculty in the

disciplines will determine appropriate senior assignments. CHEM 499 is designed for this requirement.

Departmental Graduation Requirements

The following requirements must be met in order to obtain a degree in Chemistry:

- (a) a minimum of 120 hours of acceptable credit with a cumulative GPA of 2.0 or higher;
- (b) the minimum number of credit hours required for a particular degree;
- (c) at least 12 hours of SIUE credit in major courses numbered above 299 with a cumulative GPA for those courses of 2.0 or above;
- (d) a GPA of 2.0 or above in all major courses numbered above 299;
- (e) at least 6 hours of credit in major courses numbered above 299 earned at SIUE within 2 years preceding graduation.

Duplicate credits of several types are not applicable toward graduation requirements. This restriction includes credit hours earned (through proficiency, transfer, CLEP, or from a course) after credit has been received for similar or more advanced course work in the same subject at SIUE or elsewhere.

Candidates for the Bachelor of Science degree in Education with a major in Chemistry should meet the same grade point average requirements as other degree candidates and earn either a minimum of 32 hours of credit in the major discipline or a minimum of 24 hours in the major area plus two 18 hour minors in other fields of study.

Additional Academic Options

Double Majors

Interested students may pursue a double major by completing the major requirements in two disciplines.

Bachelor of Science/Master of Science Option

Undergraduates with exceptional academic credentials may be able to earn the bachelor's degree and the Master's degree in either Biology or Chemistry in 5 years of study. Admission to this program is based on departmental recommendation to and approval by the Graduate School. Students who are interested in this program option should seek advice from their faculty advisors early in their junior year.