



**Department of Chemistry & Biochemistry  
California State University, Los Angeles**

**UNDERGRADUATE HANDBOOK**

*What's inside*

What is Chemistry? Biochemistry?

What does the Department offer?

Academic Advisement

Study Tips

Graduation Tips

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## **Welcome!**

This handbook contains important information about the department, the major, and resources on campus to help in your success at Cal State LA!

## **Chair's Greeting**

*Welcome to the Department of Chemistry and Biochemistry at California State University, Los Angeles where we strive to be one of the premier molecular science departments in the CSU. Our curriculum provides students with both breadth and depth in their chosen disciplines. We involve large numbers of our students in strong research programs that are funded by grants from major federal and private agencies. Our faculty is nationally recognized, and has a proven record of contributing to the success of our students. Graduates of our BS or MS programs are provided strong foundations for their subsequent achievements in industrial positions, in teaching at the secondary level, in medical, dental, and pharmacy schools and in Ph.D. programs in chemistry and biochemistry. Our mission is to continue this legacy of excellence to prepare all our students for a promising future.*

*Alison McCurdy, Professor and Chair*  
*amccurd@calstatela.edu*

What is  
Chemistry?

What is  
Biochemistry?

## ***The Fields of Chemistry and Biochemistry***

The fields of Chemistry and Biochemistry are concerned with the properties and behavior of matter at the atomic and molecular level. An understanding of Chemistry and Biochemistry will provide fundamental insight into the molecular nature of the physical and biological world, and will prepare you for a wide variety of careers, such as laboratory technician, forensics scientist, health professional, industrial researcher, teacher, or patent attorney. The many sub-disciplines of this field are united by a common foundation of chemical theory and a shared emphasis on laboratory-based experimentation.

The sub-disciplines of the field are usually described as: **analytical chemistry** including qualitative and quantitative description of the components of substances; **biochemistry** dealing with the details of chemical changes and structures of living organisms and their components; **inorganic chemistry** studying the chemistry of essentially all the elements except certain compounds of carbon; **organic chemistry** involving principally carbon-containing compounds; and **physical chemistry** exploring the physical principles which underlie chemical systems and changes.

Over time, the boundary lines between these areas have blurred, particularly between biochemistry and the other sub-disciplines such as molecular biology. Researchers in all fields of chemistry now routinely investigate problems once considered the province of biochemists, and cross-disciplinary collaborations are common. To some extent, traditional academic course content also reflects this cross-disciplinary trend, with examples and theory from other sub-disciplines often integrated into the core material of the course.

Researchers in all fields of chemistry now routinely investigate problems once considered the province of biochemists, and cross-disciplinary collaborations are common.

By their nature, chemistry and biochemistry are experimental disciplines. Thus, hands-on laboratory training forms an essential part of the curriculum, along with the theoretical aspects of the subjects. As the techniques and methodologies are rapidly evolving, our curriculum must change to keep pace with change.

## ***Career Opportunities -- What can you do with a BS degree in Chemistry or Biochemistry?***

You can enter the workforce right after you graduate with your B.S. degree, or you can choose to pursue further education (professional schools or graduate school) before starting your profession. It's a good idea to learn about the wide range of career possibilities available to you, and what level of training is required.

### **What can you do with a chemistry degree?**

<https://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers.html>

### **What can you do with a biochemistry degree?**

<https://www.asbmb.org/education/undergraduate/?terms=undergraduates>

The Department web page also has a collection of web links with career information:  
<http://www.calstatela.edu/dept/chem/careers>

How do you know  
what career is  
right for you?

There are a lot of resources to help you in every stage of planning for your career, from self-assessments, researching careers, to searching for a job. The Cal State LA Career Development Center is a great place to start:  
<http://www.calstatela.edu/univ/cdc/careerexpress>

**Career Opportunities:** industry, government agencies, education, graduate school (see below), manufacturing. Technical writing. Synthesis and analysis in areas such as: food, clothing, shelter, fuels, pharmaceuticals, paints, plastics, and cosmetics, medicine, dentistry, optometry, veterinary science, pure and applied research, forensic science, environmental analysis, pharmaceutical science, bioinformatics and biotechnology.

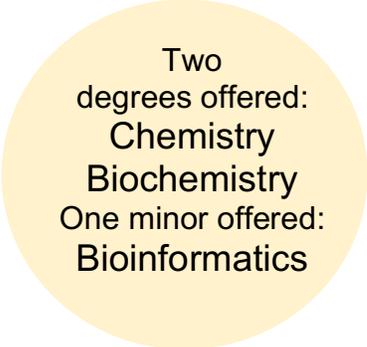
There are different pathways you can take if you want to become a high school chemistry teacher. You can complete your B.S. in Chemistry or Biochemistry, and then go on to get a single subject teaching credential. Alternatively, you can change majors to a B.S. in Natural Science: <http://www.calstatela.edu/academic/natsci>

**Graduate Studies:** After completing your BS degree, you can get more specialized training with a Master's degree or a PhD. The Master of Science degree programs prepare students for supervisory positions in industry, teaching positions in community colleges, or more advanced study toward the Ph.D. degree in chemistry, biochemistry, or molecular life sciences. The Department of Chemistry and Biochemistry at Cal State LA offers a M.S program.. For more information, see the university catalog.

## ***Overview of the Department and Degree Programs***

**California State University, Los Angeles**  
**Department of Chemistry & Biochemistry**  
<http://www.calstatela.edu/dept/chem/>

The Department of Chemistry and Biochemistry has offices and laboratories in three different buildings – Rosser Hall, Biological Sciences, and La Kretz Hall. If you ever need to go to the Department office for permits or appointments with the Chair, go to BIOS 334 (323-343-2300)



Two  
degrees offered:  
**Chemistry**  
**Biochemistry**  
One minor offered:  
**Bioinformatics**

The Department of Chemistry and Biochemistry offers two undergraduate degrees: the Bachelor of Science (B.S.) degree in Chemistry and the Bachelor of Science (B.S) degree in Biochemistry. The department also offers a minor in Bioinformatics and Computational Biology. Relatively small classes promote close faculty-student interaction and motivation. Laboratory classes provide valuable training in a wide range of techniques and modern instrumentation.

### Which degree program should you choose?

Both majors share a significant amount of foundational coursework and share an focus on understanding the natural world at a molecular level. However, they differ in what is emphasized. In terms of coursework, the Chemistry major includes more math, physical chemistry, and analytical chemistry courses; the Biochemistry major includes more biology and biochemistry courses. You should choose the major that best prepares you for your career goals and matches your interests.

If you graduate with a bachelor's degree in either chemistry or biochemistry, you will be able to:

- Demonstrate fundamental knowledge, including chemical and biochemical theories, concepts, and laboratory methods
- Understand and use scientific processes to create knowledge of molecular properties and behavior
- Demonstrate the ability to effectively communicate science
- Understand and appreciate the importance of chemistry and biochemistry to society as a whole

### Chemistry & Biochemistry Department Faculty and Staff

Here is a link to the most current list of Chemistry & Biochemistry Department Faculty and Staff: <http://www.calstatela.edu/dept/chem/department-directory>

Every semester, faculty members teach courses offered by the Department. Each faculty member has teaching interests within the fields of Chemistry, Biochemistry, and Chemistry Education. These faculty interests may focus within a traditional field, but may also span different fields within this Department or even between Departments. All

instructional faculty have office hours for students to come ask questions about classes, get advice, etc. It's good to get to know your professors! They can help you be more successful in your classes.

Some of the faculty also do research with Cal State LA students – both graduate and

Since the 1970's, sixteen faculty members in our department have received Cal State LA Outstanding Professor awards, six have received the CSU system-wide Outstanding Professor Award, one has been named California Outstanding Professor.

undergraduate students. The highly-honored faculty members in our department have taught and conducted research all over the world. They are authors of more than a dozen textbooks and hundreds of journal articles. They serve on national advisory boards, and have organized and participated in national and international chemical symposia. They also have strong research programs to enliven their

teaching. In 1996, a Professor of Chemistry was among the first to receive the *Presidential Award for Excellence in Science Mentoring* at a White House ceremony. In 1997, a professor was awarded a prestigious NSF CAREER award. In 2006, a professor was awarded the prestigious Carnegie Foundation for the Advancement of Teaching, and the Council for Advancement and Support of Education *2005 U.S. Professor of the Year*, and American Chemical Society's *Stanley C. Israel Award for Advancing Diversity in the Chemical Sciences*. Several faculty members are recipients of the Cal State LA Distinguished Women Awards for outstanding achievements and contributions. Finally, several faculty have also received the annual Faculty Research Award and the Mentoring Award by CSUPERB. Here is a list of their research descriptions: <http://www.calstatela.edu/dept/chem/research>

Department Staff have various job titles, including administrative assistant, technician, stockroom manager, and facility manager. You are likely to interact with some or all of our staff members as you complete your degree program here. They are a great resource for you, and are here to support you!

Contact information for Department office (located in BIOS 334)

Department Chair:

Dr. Alison McCurdy [amccurd@calstatela.edu](mailto:amccurd@calstatela.edu) 323-343-2300

Department Coordinator:

Ms. Maribel Estrada [mestrad2@exchange.calstatela.edu](mailto:mestrad2@exchange.calstatela.edu) 323-343-2300

Department Graduate Coordinator:

Mr. Alex Czerwinski [aczerwi2@calstatela.edu](mailto:aczerwi2@calstatela.edu) 323-343-2300

Key Locations on Campus:

Department Office –  
3<sup>rd</sup> floor Biological Sciences  
BS 336

University  
Tutorial  
Center Career  
Center

Faculty Offices,  
Teaching labs,  
research labs

Annenberg Science Complex:

- La Kretz Hall LKH or ASCL (27A)
- Rosser Hall RH or ASCB (27B)



## Resources for you

### 1) Websites

The information in this section and much more is available at the department website <http://www.calstatela.edu/dept/chem/ungradpro.htm> )

Orientation sessions are given to new students - to both freshmen and transfer students. Archived orientation presentations are available at the department website. Also, please use the [on-line General Catalog](#) and the [on-line Schedule of classes](#) or the [Professional and Global Education \(PAGE\) website](#) for information on all classes. Virtually all policies, procedures and requirements of the University are explained in the catalog (<http://ecatalog.calstatela.edu/>). Study the catalog sections relating to General Requirements for the Bachelor's Degree, General Education requirements, and major requirements. To see exactly what requirements you have or have not completed, you can look at your Campus Academic Advisement Report ([CAAR](#)): [Here's how](#). *Students who have taken some coursework during the quarter calendar (before Fall 2016) and some during semester calendar (after Fall 2016) should make an appointment with the Department Chair to identify missing major requirements and to "fix" requirements that don't show as completed (seen as red squares or incorrect course counting).* If you have questions about your CAAR or any major requirements, please make an appointment to see your faculty advisor.

### 2). Campus Resources for Student Support.

There are many support resources for you on campus, including a Health Center, Dean of Students Office, Office for Students with Disabilities, Veterans Resource Center, Dreamers Resource Center, Counseling Services, etc.

<http://www.calstatela.edu/student> In addition, please also see the section in this handbook called "How to be a Successful Student in Chemistry and Biochemistry."

### 3) Your Advisors

Regardless of your academic performance, consult with your faculty advisor at least once per semester. Faculty advisors can provide assistance with major requirements and career advice.

After your initial orientation to Cal State LA and your major, each student will be assigned to a faculty member who will, from then on, serve as that student's faculty advisor. The advisor assignments are posted outside the department office and linked to the website. You will see there are three different advisement resources (Faculty Advisors, Department Chair, and NSS Advisement Center Advisors) for different needs. The following table summarizes which advisor will help you with each need:

<b>NSS Advisement Center</b> (323-343-5284; <a href="mailto:nssac@calstatela.edu">nssac@calstatela.edu</a> )  <a href="http://www.calstatela.edu/nss/nss-academic-advisement-center">http://www.calstatela.edu/nss/nss-academic-advisement-center</a>	<b>Chemistry &amp; Biochemistry Department Chair</b> <b>(appointments: 323-343-2300)</b>	<b>Chemistry &amp; Chemistry Department Faculty Advisor (contact faculty)</b>
Initial Advisement - GE and major (if you missed your Orientation Session)  Graduation Check  Academic Plans for Financial Aid SAP Appeals  Probation Students  GE requirement questions  GE course petitions  Short (up to 1 year) and Long-Term (more than 1 year) Academic Planning  Repeat Limit Exception Requests  GE and major requirement term change (quarters versus semesters)  Referrals to campus resources	Initial Advisement - Major information only (if you missed your Orientation Session)  Declaration/change of major  Course substitutions (major courses only – not GE courses)  Transfer credit issues (major courses only)  Reinstatements  Leave of Absence  Unit overload  Short (up to 1 year) and Long-Term (more than 1 year) Academic Planning (majors courses)  Major requirement term change (quarters versus semesters)	Course instruction support (to students enrolled the faculty's courses)  Research student support  Meet with assigned advisees (assigned by last name to faculty advisors): <ul style="list-style-type: none"> <li>• Review of academic progress</li> <li>• Questions about programs</li> <li>• Referrals to campus resources</li> <li>• Career advisement</li> <li>• Choice of major electives</li> <li>• Quarters/semesters questions</li> <li>• Academic planning for the year (majors courses)</li> </ul>

Health Careers Advisement Office (HCAO). This office provides information and counseling to any student seeking entry into the major health professions including Medicine (allopathic and osteopathic), Optometry, Veterinary Medicine, Dentistry, Pharmacy, Podiatry, Chiropractic Medicine, Physical Therapy, and Physician Assistant Programs. The HCAO's primary goal is to provide support services and information for pre-health professional students before, during, and after their application to health professional schools. There are also many on-campus student-led support groups for pre-

health professional students with regularly scheduled activities and events to further enhance student development. <http://www.calstatela.edu/healthcareers>

## ***Planning Your Degree Program***

### WHERE TO START?

Getting started with the correct selection of classes is especially important for chemistry or biochemistry majors because later courses build upon the foundation of skills and knowledge formed during earlier courses.

In addition to taking math courses as early as possible, you should also include key major courses.

You have already attended either Freshmen or Transfer Orientation, in which the focus was on what you should take in your first semester at Cal State LA. Because of the critical importance of mathematics in all of chemistry and physics, you were advised to start taking mathematics

courses right away. In addition, you should also take General Chemistry I and II as soon as possible, since they must be completed before you can take *any* other chemistry courses.

### WHAT'S NEXT? Make a multi-year plan!

Rather than only plan what you should take in just the next semester, you should devise a multi-year plan that includes all of your graduation requirements. You can do this on paper (there are blank templates at the end of this handbook), or you can use the Degree Planner (on GET). In this way, you can see for yourself how long it will take you to graduate under different scenarios: whether or not you take courses in summer; whether you take 12 or 15 units per term. This should be revised or reviewed every semester to take into account what you have successfully completed, or if there were any changes due to course availability. *If you have questions about degree requirements or making your multi-year plan using the information below, you can contact your Faculty Advisor or the Department Chair.* The Chair and Faculty Advisors will review your plan with you to make sure there aren't any mistakes.

### **Information you need to create a multi-year plan**

Most courses in science and mathematics build directly on subject matter presented in earlier courses. It is therefore essential to take classes in the proper sequence and observe all prerequisites listed in a course description. Prerequisites are established for solid academic reasons and are not designed simply to be roadblocks to your progress. On the contrary, prerequisites are designed to protect you by making sure that you do not take classes for which you are unprepared.

Below are links for each major that include prerequisite maps and 2 different types of "roadmaps." The prerequisite map uses arrows to show what courses **MUST** be finished before you can continue in the program. The roadmaps present examples of how to complete the degree in 4 years (incoming freshmen) or 2 years (transfer students), assuming students are calculus-ready in Fall of their entering year.

- **BS CHEMISTRY PROGRAM (SEMESTER)** - [BS CHEM Prerequisite Map PDF](#); [BS CHEM 4 year roadmap PDF](#); [BS CHEM 2 year roadmap PDF](#) for transfer students
- **BS BIOCHEMISTRY PROGRAM (SEMESTER)** - [BS BIOCHEM Prerequisite Map PDF](#); [BS BIOCHEM 4 year roadmap PDF](#); [BS BIOCHEM 2 year roadmap PDF](#) for transfer students
- **BS CHEMISTRY PROGRAM (QUARTER CATALOG)** - [BS CHEM \(qtr\) Prerequisite Map PDF](#); [BS CHEM \(qtr\) 4 year roadmap PDF](#)
- **BS BIOCHEMISTRY PROGRAM (QUARTER CATALOG)** - [BS BIOCHEM \(qtr\) Prerequisite Map PDF](#); [BS BIOCHEM \(qtr\) 4 year roadmap PDF](#)

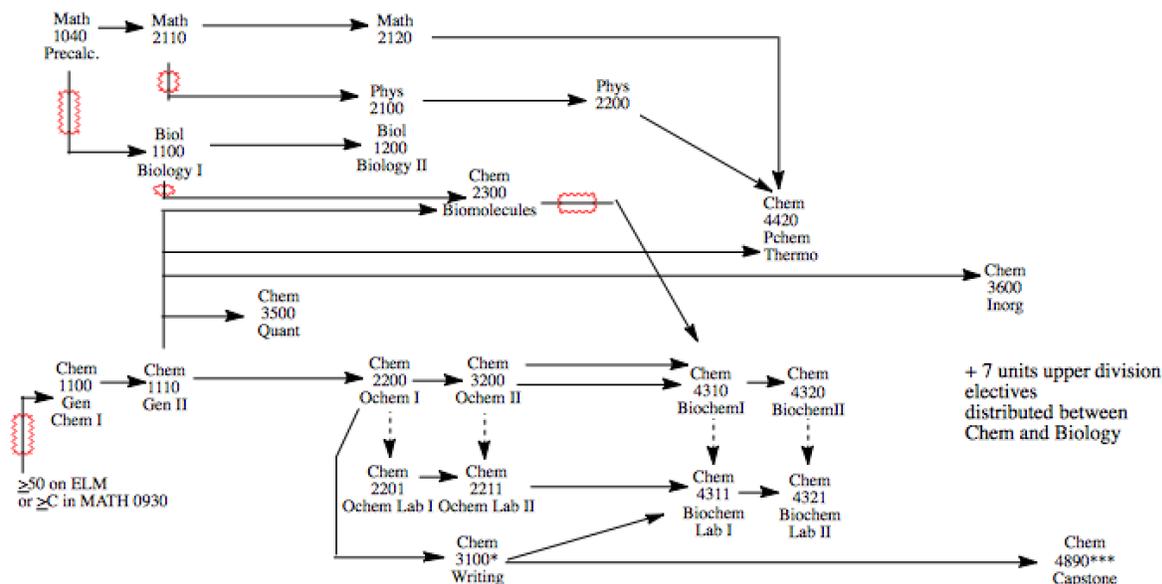
Here is an example of a 4-year roadmap (partial, without the notes) for BS Biochemistry majors. It includes major requirements plus placeholders for GE courses. Based on what math you need to take and if you have taken coursework elsewhere, your own multi-year plan will look different than this.

Sample 4 Year Roadmap for Students in the Bachelor of Science Degree in BIOCHEMISTRY** (Total 120 Units)			
	Fall	Spring	Total Units
Year 1	MATH 2110 (4) <sup>a,b,&amp;*</sup> Calculus I	MATH 2120 (4) <sup>b</sup> Calculus II	
	CHEM 1100 (5) <sup>c</sup> Gen. Chemistry I	CHEM 1110 (5) <sup>*</sup> Gen. Chemistry II	
	GE (A1, A2 or A3) (3)	GE (A1, A2 or A3) (3)	
	NSS 1001 (3) Intro. To CSULA	GE (A1, A2 or A3) (3)	
	<b>Total 15 Units</b>	<b>Total 15 Units</b>	<b>30</b>
Year 2	BIOL 1100 (5) <sup>f</sup> Princ. Biol. I	BIOL 1200 (5) Princ. Biol. II	
	CHEM 2200 (4) Organic Chem. I	CHEM 3200 (4) Organic Chem. II	
	CHEM 2201 (1) Organic Lab I	CHEM 2211 (1) Organic Lab II	
	CHEM 2300 (2) Intro. Biomol.	CHEM 3100 (3) <sup>d</sup> Writing for Chem.	
	LD GE Block C, D or AI (3)	LD GE Block C, D or AI (3)	
	<b>Total 15 Units</b>	<b>Total 16 Units</b>	<b>31</b>
Year 3	CHEM 4310 (3) Biochem. I	CHEM 4320 (3) Biochem. II	
	CHEM 4311 (2) Biochem. Lab	CHEM 4321 (2) Biochem. lab	
	CHEM 3500 (4) Quant. Analysis	PHYS 2200 (5) Gen. Physics II	
	PHYS 2100 (5) <sup>e</sup> Gen. Physics I	LD GE Block C, D or AI (3)	
		LD GE Block B, C, D or AI (3)	
	<b>Total 14 Units</b>	<b>Total 16 Units</b>	<b>30</b>
Year 4	CHEM 3600 (4) Inorg. Chem.	CHEM 4890 (3) <sup>e,g</sup> Capstone	
	CHEM UD elective (3) <sup>f</sup>	CHEM UD elective (4) <sup>f</sup>	
	LD GE Block C, D or AI (3)	CHEM 4420 (3) Physical Chem.	
	LD GE Block C, D or AI (3)	UD GE Block C or D (3)	
	UD GE Block C or D (3)		
	<b>Total 16 Units</b>	<b>Total 13 Units</b>	<b>29</b>
<b>GRAND TOTAL</b>			<b>120</b>

Revised date: 11/3/17

On the next page is an example of a prerequisite map (reduced size!) for BS Biochemistry majors. While it looks complicated, it is actually a useful drawing to help you decide what to take next (see the appendix). Solid arrows mean that you MUST take one course in order to register for the next one. Dashed arrows mean that you can take the course at the same term or prior to the next one.

ILLUSTRATION OF WHICH COURSES ARE PRE/CO-REQUISITES FOR OTHERS: BS BIOCHEMISTRY SEMESTERS



Solid arrows are pre-requisites (MUST be completed with a C- or better before taking the course)  
 Dashed arrows are co- or pre-requisites ((MUST be completed with a C- or better before taking the course OR during the same term as the course)

\*Satisfactory completion of GVAR is a pre-requisite

\*\*\*Also requires passing grade on the GVAR, completion of Blocks A and B4, an additional course from Block B, and at least one course each from blocks C and D.

Remember that if you are a BS Biochemistry major, you should NOT take lower division GE Biological Sciences; lower division GE Physical Sciences, or lower division GE quantitative reasoning because your major coursework satisfies these requirements. CHEM 4890 satisfies Upper division GE Block B.

Revised 7/17

## Frequency of Course Offerings

When you are making your multi-year plan, you need to know how frequently courses are offered. Some courses are offered every term, others are offered once per year, and still others are offered every other year. This information is contained in the **Course Offerings Schedule (PDF)**. If a course is offered, but not enough students enroll in it, it may be cancelled. For course descriptions of each of our course, see the University Catalog: <http://ecatalog.calstatela.edu/>

## General Education requirements that are fulfilled by major courses.

Several General Education (GE) requirements are met by courses required in the major, so you don't need to take additional courses to satisfy these requirements. The major courses "double count" in both GE and the major.

BS Biochemistry majors:

Lower division (LD) GE B4 Quantitative Reasoning is satisfied by MATH 2110

LD GEB1 Physical Sciences is satisfied by PHYS 2100.

LD GE B2 Biological Sciences is satisfied by BIOL 1100.

UD GE B Natural Sciences is satisfied by CHEM 4890

BS Chemistry majors:

Lower division (LD) GE B4 Quantitative Reasoning is satisfied by MATH 2110

LD GEB1 Physical Sciences is satisfied by PHYS 2100.

UD GE B Natural Sciences is satisfied by CHEM 4890

### **Major-specific Declaration Requirements.**

Starting Fall, 2018, freshmen are not admitted directly into the BS Chemistry or BS Biochemistry majors, but instead begin as pre-majors. Once students meet the requirements (<http://www.calstatela.edu/admissions/major-specific-criteria>), they can declare their major. For both majors, the criteria are:

**Required** minimum cumulative GPA: 2.2

**Required** major preparation courses (grade of "C" or better required):

- MATH 1040 – Precalculus; or MATH 1081 - Precalculus: Functions and MATH 1083 – Mathematical Analysis II; or MATH 1082 Precalculus I: Functions with Lab and MATH 1083 – Mathematical Analysis II
- CHEM 1100 – General Chemistry I
- CHEM 1110 – General Chemistry II

**Required** General Education courses not covered by major preparation courses listed above:

- Written Communication
- Oral Communication
- Critical Thinking

## ***How to Be a Successful Student of Chemistry and Biochemistry***

Many students find courses challenging. The key to succeeding in the face of such challenges is to figure out how to change the methods they used

Make enough time for learning! Block out enough time during every day, every week for studying. Focus on studying – no multitasking! In general, each unit of credit will require at least two to three hours per week of work outside of class for reading and homework in addition to the time that you spend in the lecture and laboratory. To help you keep track of study time, as well as to help you plan and organize your time, you might want to use a weekly planner/schedule (see the Appendix).

Learn what Neuroscience says about how to study! There are a lot of misconceptions about studying, but these videos will teach you what the evidence says are good study habits: <http://www.samford.edu/departments/academic-success-center/how-to-study> Students who change how they study after an early quiz or exam in class have been able to improve their grades dramatically.

Practice Solving Problems! One of the best ways to learn chemistry is to practice solving problems - alone and in study groups. It is extremely important to work out as many problems as possible -- writing them down, repeating if necessary. (And while you may have been given the solutions to some problems, or have a solutions manual, you should work out the problem *before* you look at the answer!). Embrace challenging work and “getting it wrong” as part of the path to mastery.

Use the textbook! This is a resource for you. As you read the textbook, do the embedded sample problems to reinforce what you are reading about.

Don't Memorize! Although some memorization is necessary to learn chemistry, you will not master any topic by rote memorization. You must learn the basic principles involved, and then be able to apply them to *new* situations and problems.

Go find help! There are lots of people that can help you learn chemistry. You can form a study group with some classmates. You can go to the professor during office hours – that is why they hold office hours. You can get tutoring from tutors (for free!) at the University Tutorial Center <http://www.calstatela.edu/tutorialcenter> or from Chemistry and Biochemistry Club members.

Study Load. To graduate in 4 years, you should aim for taking 30 units each year. The recommended full-time load for undergraduates is 15 units per semester. A minimum of 12 units per semester is the requirement for a full-time student to receive the maximum financial aid. If you wish to take more than 18 units, you must have a minimum GPA (depending on your total accumulated units) and fill out an overload petition.

In general, each unit of credit will require *at least two to three* hours per week of work outside of class for reading and homework in addition to the time that you spend in the lecture and laboratory.

## ***Ways to enrich your education and career preparation***

- 1). Attend talks hosted by Chemistry & Biochemistry Department, or other related departments.

The Department hosts several events that focus on current research in chemistry and biochemistry and related fields, including a weekly departmental scientific seminar where a speaker from a university is invited to present their research, an annual Lloyd Ferguson Research Presentation, honoring the late Dr. Lloyd Ferguson.

- 2). Pursue Undergraduate Research Opportunities

Your broad understanding of chemistry or biochemistry is valuable to careers in academia, business, government, law, medicine, nonprofit organizations (e.g., museums, private foundations), and other fields. However, to further broaden your educational experience, you are highly encouraged to participate in a research project under the direction of one of the department's faculty members. The department has a strong tradition of including undergraduate students in research, and often, you are provided financial support through research grants, fellowships, scholarships, or research assistantships. Nearly 100 students are currently participating in independent research programs under the direction of chemistry and biochemistry faculty.

Participating in laboratory research will give you the opportunity to experience the excitement of scientific discovery. Many students are co-authors of professional publications that describe their results. In addition, many have the opportunity to present their findings at national scientific conferences such as the American Chemical Society (ACS) National Meeting.

A research project can be used for elective credit and for Departmental Honors Program or Honors College Honors Thesis. See the Catalog for the requirements for participation in the Chemistry and Biochemistry Department Honors Program.

If you are interested in doing laboratory research on campus, first look for research active faculty members by searching our department website. Next, email the faculty member of your choice to ask them for an opportunity to join their research group. Be sure to include why you want to participate in research, your career goal, your class standing (first year, second year, etc.) and your CV/resume. Please also think about how many hours per week you are willing to commit to doing research, and for how many terms. You probably will be invited to have a discussion with the faculty member in person. It wouldn't hurt to think of a question about their research ahead of time – this helps show the faculty member that you are interested in the research. Sometimes faculty do not have room in their labs to add more research students, so that sometimes is part of the decision-making process for the faculty mentor. Once the faculty member agrees to be your research mentor, you will have to enroll in

CHEM 4990 before the add deadline. This course is graded with a letter grade, based upon your efforts and accomplishments, as reflected in a written report.

In some cases, you can be paid to work in a research lab! Some faculty have funding that allows them to pay students, and there are also some research training programs that include paid positions and additional professional development opportunities (resume workshops, how to apply to graduate school, etc). This includes the MORE Programs, LSAMP, CEaS, and PREM.

### 3) Join a Student Organization.

There are a number of academic and professional student organizations that you can join to support you in your studies and career goals. Check the Center for Student Involvement for a complete list of clubs and other activities that will get you involved! (<http://www.calstatelausu.org/csi>). One popular and active club is the Chemistry and Biochemistry Club!

### 4). Complete a minor in addition to your major. In addition to those below, there are many other minors available. Check the University catalog: <http://ecatalog.calstatela.edu/>

#### Bioinformatics and Computational Biology minor (BINF minor)

If you minor in Bioinformatics and Computational Biology (BINF minor), you will be given an overview of bioinformatics software programs and databases that are utilized to make discoveries in molecular life sciences. Bioinformatics is the science of collecting and analyzing complex biological data. The BINF minor will teach you how to create software programs that analyze molecular life science data and prepare you for more advanced studies in bioinformatics, systems biology, genomics, and computational biology. The BINF minor will provide you with further preparation to pursue graduate and professional schools. In addition, pharmaceutical and biotechnology industries offer career opportunities for those with advanced BINF training.

#### Forensic Science minor (Criminalistics Program)

The department supports a Forensics minor through the School of Criminal Justice and Criminalistics. Forensic Science represents the interface of science and the law. The minor is intended to complement your Chemistry or Biochemistry major by introducing you to the forensic perspective as it operates within and across justice system communities. The courses offered in the minor integrate the scientific concepts developed from the basic sciences to problems unique to the forensic sciences, including crime scene reconstruction, legal integrity of scientific evidence, expert testimony, and individualization. The curriculum covers several specializations, including forensic biology, forensic chemistry, firearms, crime scene management and courtroom interpretation of evidence. You may also take select courses in the minor without formal enrollment in the program provided you have satisfied the course prerequisites.

## ***Frequently Asked Questions.***

### **What does it mean to be a “pre-chemistry major”?**

This means that once you complete CHEM 1100, CHEM 1110, and MATH 1040 (or the equivalent), each with a C or better, 3 GE requirements, and have an overall GPA of 2.2, you can declare a chemistry (or biochemistry) major. The major-specific declaration criteria are listed here: <http://www.calstatela.edu/admissions/major-specific-criteria> Being a pre-major does NOT mean you will take longer to graduate!

### **If I have taken coursework at another school, how do I get credit for it at Cal State LA?**

Classes taken at community colleges or other universities need to “articulate” for you to receive transfer credit. Transcripts at Cal State are not always processed immediately, so it is important to get an accurate idea of what courses (taken at another college) will “count” towards your degree at Cal State LA. The website [www.assist.org](http://www.assist.org) provides information about articulation agreements between institutions. If a course that you have taken is not listed, and you feel that you have taken an equivalent course, you may petition it. For courses that are major requirements, you should bring a copy of the catalog description and if possible a course syllabus to the chair of the Chemistry & Biochemistry department. For courses that are General Education requirements, bring a copy of the catalog description to an advisor at the NSS Advisement Center.

### **Can I ever use different Cal State LA courses than those listed in the major degree requirements to substitute for major requirements?**

For elective courses, possibly. For most required courses, no. Course substitutions may be made under special circumstances, and only with approval of the Department Chair. Please make an appointment with the Department Chair to discuss your specific request and your circumstances. For example, if you are approved to graduate in Fall, but one of the courses you need to take is only offered in Spring, you should meet with the Chair to discuss whether there can be an alternative arrangement to keep you on track to graduate.

### **What happens if I don’t pass a course in the major with a C- or better?**

First, take some time to reflect on what changes should be made so that when you repeat the course, you are able to master the material. Please take a look at the section in this manual for succeeding in chemistry courses.

Repeat Course Forms. The University permits you to repeat a course in which you received a (C-) or less. You may not repeat a course more than twice (you can’t take

the course more than 3 times total) unless you fill a repeat limit exception request. There is also a limit to the total number of units you are allowed to repeat, and if you reach that limit, you must petition to be able to repeat additional classes. These requests must be made to the NSS Director of Advisement and Student Success Gene Sandan.

Grade Forgiveness. If you repeat a course and get a better grade, you are able to request that the improved course grade replaces your prior grade for your GPA calculation using a Grade Forgiveness request form, but the original grade will still appear on your transcript. There are limits to the number of units you can replace. If you have reached that limit, you can then request that the grades are averaged. You may wish to seek advice from an advisor before deciding which courses to file this paperwork for in order to maximize your GPA improvement.

### **If I don't attend a class, will I be automatically dropped from the roster?**

This depends on the class! For some classes with wait lists, like lab classes, if you do not show up on the first day (or communicate BEFORE that first day that you must miss the first day), the instructor may drop you from their roster. But for other classes, if you never attend, or stop attending, you will remain on the roster.

Add/Drop procedures. Pay close attention to the deadlines for adding/dropping classes posted each semester. Information about this can be found here: <http://www.calstatela.edu/registrar/records-enrollment>. Just because you stop attending class does not mean that you will automatically be dropped from the class roster! In fact, if you stop attending class and you do not drop the class, you will be assigned a WU, which counts in your GPA as an F. There is a time period (first 20% of the term) in which you can drop a course with no record through GET. After that time, you will have to fill out a petition form to drop a course, but that will result a W grade. There is a limit to how many units of W you can have. In the last 20% of the term, a different form must be used, and only serious and compelling reasons will result in a drop.

### **What do I do if I have a complaint about an instructor or a course grade?**

In most circumstances, you should start by approaching the instructor with your feedback or concerns or questions. If you are not able to resolve the issue on your own, or if you are not comfortable approaching the instructor, please make an appointment with the Department Chair. The Department Chair will work with you and/or the instructor to resolve the issue.

### **I think I'm ready to graduate in a year – what do I do?**

Congratulations! You are close to finishing! Now is the time to be sure about any remaining graduation requirements so there are no surprises that delay your graduation.

Filing for graduation. If possible, apply for graduation two semesters ahead. For example, if you are planning to graduate in Spring 2019, you could apply at the end of Spring 2018 or in Summer 2018. It is recommended that you meet with the Chair of the Chemistry & Biochemistry Department before you make an appointment with the NSS Advisement Center. At this meeting with the Chair, you will go over what is missing or any errors that need correcting. After that, make an appointment with the NSS Advisement Center for a graduation check. You should bring a graduation application with you with the basics filled out (name, CIN) and as much of missing requirements as you are able. If any of it is confusing, the NSS Advisors will help you out. If you have any past program sheets, you can bring those as well.

If you don't end up finishing all your requirements the term you filed for, you will need to submit a graduation term update form and pay a \$25 fee. Otherwise, you will not be allowed to register for any more classes past the term you initially filed for. For example, if a student filed for graduating in Spring 2018, but then they fail a required course, they will be denied their degree. In order to reenroll in that course, they will need to file a grad term update for SU 18 (or F18) and pay \$25 once they turn it in. Their graduation term will be updated to SU 18 (or F18) and the student can then enroll in the course they will need.

# APPENDIX

Time Management - Study Log.

One way to make sure you are devoting enough time to your classes is to keep track of how many hours you study. Record the hours you study each day and the total for each week. Remember the rule-of-thumb is two to three hours outside the class per unit per week. This includes doing homework, writing reports and papers, preparing for presentations, reading, and studying for exams. You must manage your time effectively and be the overall judge of the quality and quantity of your study.

Study Log \_\_\_\_\_ Semester

Week	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Total hours
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
Finals								

**Multi-Year Course Planning Template** – Keep track of all your remaining graduation requirements and plan ahead so you know what courses to take. Sometimes courses get cancelled or conflict with one another, so you may need to revise your plans as you go.

Fall 20__		Spring 20__	
Course	Units	Course	Units
Total Units		Total Units	

Summer 20__	
Course	Units
Total Units	

Fall 20__		Spring 20__	
Course	Units	Course	Units
Total Units		Total Units	

Summer 20__	
Course	Units
Total Units	

Fall 20__		Spring 20__	
Course	Units	Course	Units
Total Units		Total Units	

Summer 20__	
Course	Units
Total Units	

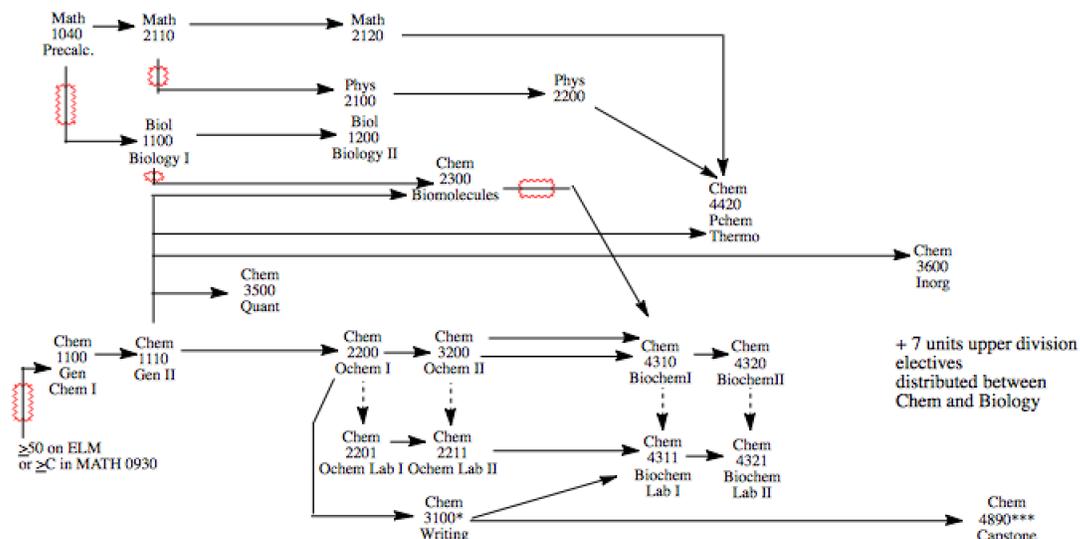
Fall 20__		Spring 20__	
Course	Units	Course	Units
Total Units		Total Units	

Summer 20__	
Course	Units
Total Units	

# How to use the pre-requisite map to decide what major classes to take next

Here is the pre-requisite map for BS Biochemistry:

ILLUSTRATION OF WHICH COURSES ARE PRE/CO-REQUISITES FOR OTHERS: BS BIOCHEMISTRY SEMESTERS



Solid arrows are pre-requisites (MUST be completed with a C- or better before taking the course)  
 Dashed arrows are co- or pre-requisites ((MUST be completed with a C- or better before taking the course OR during the same term as the course

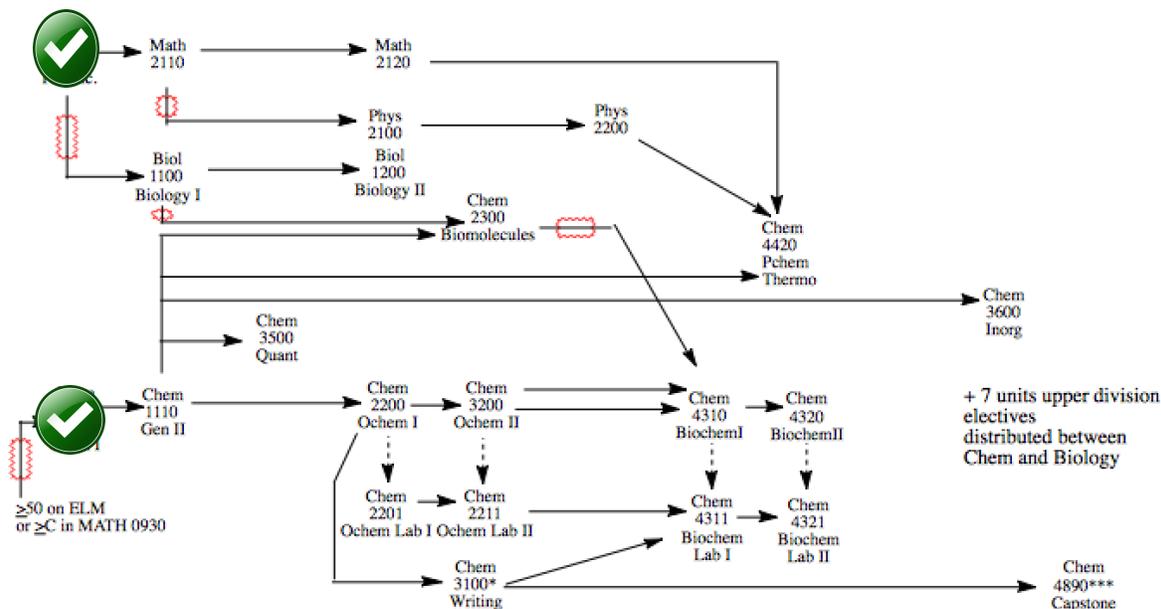
\*Satisfactory completion of GWAR is a pre-requisite  
 \*\*\*Also requires passing grade on the GWAR, completion of Blocks A and B4, an additional course from Block B, and at least one course each from blocks C and D.

Remember that if you are a BS Biochemistry major, you should NOT take lower division GE Biological Sciences; lower division GE Physical Sciences, or lower division GE quantitative reasoning because your major coursework satisfies these requirements. CHEM 4890 satisfies Upper division GE Block B.

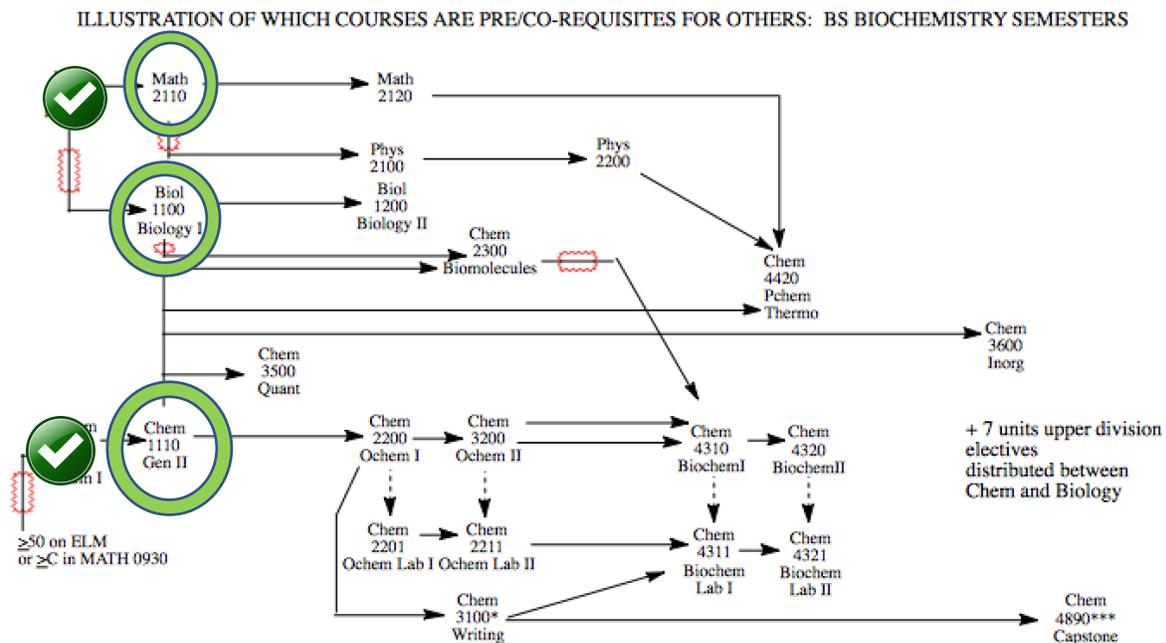
Revised 7/17

Cross off the courses you have already taken. For example, if you are calculus-ready and you have finished General Chemistry I:

ILLUSTRATION OF WHICH COURSES ARE PRE/CO-REQUISITES FOR OTHERS: BS BIOCHEMISTRY SEMESTERS



Follow the arrows from these and circle all the courses you are able to (prepared to) take. In this example, they are MATH 2110, BIOL 1100, and CHEM 1110. (And any missing GE, which is not shown here). Prioritize classes that are pre-requisites to other classes



Ideally, all of these courses are available and fit in your schedule and don't overlap with one another. However, sometimes a course is full, or it is canceled, or it conflicts with another class or your work schedule. Since it is not always easy to get your major courses, and because they must be taken in a specific sequence, you should prioritize taking your major course requirements, and then after those, fit your GE course requirements around your major courses.