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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 research and research training 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.

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 students 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. 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.
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.

GENERAL INFORMATION

• Degrees offered.

The department currently offers two undergraduate degrees, the **BS in Chemistry** and the **BS in Biochemistry**. The BA in Chemistry has been discontinued, effective Fall, 2013. When choosing between these degree options, students should discuss the career implications with their advisor.

The Bachelor of Science degrees are designed for those who plan to obtain positions in scientific and industrial laboratories, or attend graduate or professional schools. The BS degree in Chemistry is accredited by the American Chemical Society; the BS degree in Biochemistry is also accredited if research is taken as an elective.

• Chemistry & Biochemistry Department Faculty and Staff.

Every term, faculty members teach courses and engage in research with students. Each faculty member has research and 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. The list of faculty in the Department changes over time due to new hires and retirements.

Department Staff have various job titles, including administrative assistant, technician, glassblower, stockroom manager, facility manager. Students will be interacting with some or all of these staff members as they complete their degree programs here.

For a current list of faculty and staff in our department, see the Appendix.

• Resources and important information.

**Faculty Advisors in the Department.** Initially all new chemistry and biochemistry majors are advised by the department chair. After one or two terms, each student will be assigned to a faculty member who will, from then on, serve as that student’s advisor. **Students should consult with their faculty advisor each term.** Faculty advisors are able to provide assistance with major requirements and career advice.

**NSS Academic Advisement Center.** Staff advisors are knowledgeable about General Education Requirements, major requirements, and can help you find the right campus resource to help you be successful at CSULA. You can make an appointment with one of the NSS Advisors for help with a wide variety of issues.
General Catalog. Virtually all policies, procedures and requirements of the University are explained in the General Catalog. This catalog is available both as a hard copy and online. Especially for new students, it is important to check the online catalog for recent changes that may not yet have appeared in the printed catalog but which apply to you as an incoming student. Study the catalog sections relating to General Requirements for the Bachelor’s Degree, General Education requirements and your major requirements. The catalog also lists course descriptions for required and elective courses.

Know your Catalog date for GE and your major. We have revised our degree programs recently. Thus, the requirements listed in the most recent catalog are different from those of earlier catalogs. It is very important to know the date that you officially became a chemistry or biochemistry major. This “major declared date” determines what set of degree requirements you must meet. Also note that frequently students will have a “GE catalog date” that is different (sometimes years earlier) than the major declared date.

Course equivalencies for Transfer Students. Transcripts are not processed immediately, so it is important to get an accurate idea of what courses you have taken at another college will “count” towards your degree at CSULA. The website 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. You should bring a copy of the catalogue description, a general petition form, and if possible a course syllabus to an advisor.

Documents to help you plan what courses to take. A detailed discussion of your degree program is provided in the section of this manual entitled “Planning your Degree Program.” Some documents have been prepared to help you plan your class schedule. These include: Future Course Offerings; Degree Checklists; Pre-requisite Pathways; Two- and Four- Year Roadmaps.

Department web page. http://www.calstatela.edu/dept/chem/ This page provides detailed information on department events, programs, facilities, faculty and staff, courses and seminars. It contains links to the resources described above.

• Procedures for taking Classes

Add/Drop procedures and incompletes. Pay close attention to the Program Change Procedures and deadlines for adding/dropping classes posted each term. Students who are new to CSULA often are unaware of the short deadlines and the consequences of not following the proper procedures. Just because you stop attending class does not mean that you will automatically be dropped from the class roster. Failure to follow the procedures for dropping a class can lead to a grade of (U) or (F). Typically, students may withdraw from any class through
the sixth day of instruction simply by using GET. In such cases, no record of the withdrawal appears on the permanent academic record. As a courtesy, particularly in laboratory courses, students should notify their instructors so that other students may be admitted. In all cases of drops, the responsibility for the drop rests with the student (do not assume your instructor will drop you). After the above deadline, students who withdraw from a class receive a grade of (W) on their permanent academic record. Withdrawals are not permitted during the final three weeks of the quarter except under extraordinary situations with written documentation, and often involve withdrawal from all classes in the student’s program.

An Incomplete (I) grade may, at the discretion of the instructor, be assigned in circumstances where a student is passing the course, but because of extenuating circumstances is not able to complete all or part of the work during the last four weeks of the course. The incomplete form should be filled out specifying the work that remains to be completed, and needs both the student and instructor’s signatures. The (I) grade is an interim grade only, and the student must complete the outstanding work within one year following the quarter in which it was assigned. Extensions of the one year time limit may be obtained by petitioning the University Undergraduate Studies Subcommittee in writing (using the University General Petition Form). Once the work is completed, the (I) grade is changed to a final letter grade, although the permanent record still shows the original (I) grade, along with the date that the Incomplete was removed. An Incomplete that is not removed during the time allowed will remain on the student’s permanent record as an (IC) and will be counted as an (F) in GPA calculations.

Repeat Course Forms. The University permits students to repeat a course in which the student received a (C-) or less. If a student files a repeat course form, the first grade remains on the transcript, but only the second grade is counted in the overall GPA. There is an upper limit of 20 units total for which a student may use this procedure, so the student should check with their advisor before filing a form. The form may be filed retroactively, so it is wise to make sure that the second grade is in fact better than the first before filing the form since the procedure can only be done once for a particular course. The student may wish to seek advice from an advisor before deciding which courses to file this paperwork for. (For example, a student may have the choice to improve their major GPA by a little or their overall GPA by more).

Prerequisites. 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 a student’s progress. On the contrary, prerequisites are designed to protect students by making sure that they do not take classes for which they are unprepared.

Study Load. The recommended full-time study load for undergraduates is 16 units per quarter. A minimum of 12 units per quarter is the requirement for a full time student to receive the maximum financial aid. If a student wishes to
take more than 18 units, they must petition, have a GPA greater than 3.00, and in addition, chemistry and biochemistry majors must have completed ENGL 102, the WPE, and MATH 103 and have one quarter of grades on record from Cal State L. A.

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, the Appendix has some resources you can use.
PLANNING YOUR DEGREE PROGRAM

WHERE TO START

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

The courses for which you register in your first quarter depend upon your previous course preparation. Transfer students may use the web (see page 5) to determine what courses may be transferred to their program. A word of advice: because of the critical importance of mathematics in all of chemistry and physics, students should be sure to start taking mathematics courses at the earliest opportunity in their program. In addition to taking math courses as early as possible, you should also include other courses that will help you in your major. In any academic field, the ability to write clearly and effectively is an essential skill.

• Requirements for Entering Students.

EPT  English Placement Test. This test is required for all entering undergraduates, with some exceptions (see catalog) such as a score of 470 or higher on the SAT verbal test or 25 or higher on the ACT English test. Eligibility for ENGL 095, 096, and 101 is determined by the results of the EPT, which students must take before they register for any courses. The exam is usually given once per quarter. For exam dates and registration information contact the University Testing Center (Library South 2098).

ELM  Entry Level Mathematics Exam. This test is required for all entering undergraduates, with some exceptions (see catalog), such as a score of 560 or better on the Math section of the SAT, a score of 24 or higher on the ACT Math test, a score of 25 or higher on the Enhanced ACT Math test, or completion of a college Math course that satisfies the GE Math requirement. The exam is usually offered once per quarter - see Schedule of Classes for the dates. The ELM must be taken before registering for any courses and may be taken at another CSU campus if their exams’ dates are more convenient. An ELM workbook is available in the campus bookstore for about $7.00. See Testing Center (Library South 2098) for further details.

Chemistry Placement Exam. A passing score on this test is required to enroll in CHEM 101. The content of the exam is roughly 40% quantitative chemistry, 40% descriptive chemistry and 20% math. The exam is offered on a daily basis, with examination times beginning on the hour throughout the day in the Testing Center (Library South 2098). The exam takes 45 minutes, and is graded immediately afterward to make the score available to the student. The exam may be taken only once per quarter.

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Mathematics Proficiency Exams. A passing score on these exams is required for registration in MATH 206 (or a grade of (C) or better in MATH 104A and MATH 104B within the previous year). There are exit exams for MATH 104A and 104B. Students must pass both exams to qualify for calculus. There is no time limit for these exams, each of which consist of 15 multiple choice questions. The exams can be taken on demand, but there is a limit on how many times the tests may be repeated during the quarter. For details contact Testing Center, Library South 2098. These screening exams can be taken before the ELM, but both are required prior to enrolling in Math courses.

Introduction to Higher Education Course. All new freshman students must take a 4 unit course, Introduction to Higher Education, NSS 101 during their first or second quarters. This also fulfills Block E requirement. All transfer students must take a similar upper division course, Transition to CSULA for NSS Majors, NSS 301 (2 units) in their first or second quarter.

OVERVIEW OF COURSE SEQUENCES

In general, earlier (pre-requisite) courses will provide the necessary foundation of skills and knowledge for later courses to build upon. This is why it is important for you to take courses “in order.” Above all, chemistry and biochemistry are considered experimental sciences, which is reflected in the significant amount of required laboratory classes.

The following pages show a visual map of the required core math and science courses in our undergraduate degree programs. These diagrams are most useful for you to see what courses are pre-requisites or co-requisites to other courses. There are several resources to help you plan your course selections for each year of study linked to the department webpage. These include the sample two-year (for transfer students), four- and five-year plans, checklists for each degree, and a list of future course offerings. Additionally, there are blank forms for planning your coursework in the Appendix.

It is advisable that students complete at least one quarter of calculus before starting the Physics 211-level sequence (two quarters are better). It should also be noted that the General Chemistry sequence, CHEM 101-103 starts in the Fall and Winter quarters only.
ILLUSTRATION OF WHICH COURSES ARE PRE/CO-REQUISITES FOR OTHERS: BS BIOCHEMISTRY

Solid arrows are pre-requisites
Dashed arrows are co- or pre-requisites

*Satisfactory completion of the GWAR is a pre-requisite

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

Solid arrows are pre-requisites
Dashed arrows are co- or pre-requisites
+ 7 units upper division
Chem electives

*Chem 103 is a pre-requisite for this course. Either Math 215 or Math 401 may be used as a pre-requisite for this course. Phys 306 is recommended.
**412B has the same pre-requisites as 412A. If you have completed the math and physics prerequisites to take Chem 403, you may be allowed to take Chem 412AB before Chem 401 or 402.
***Satisfactory completion of GWAR is a pre-requisite
PLANNED COURSE OFFERINGS (Subject to change). NOTE: Even if the department plans to offer a course, if that course does not have enough students (usually 10) enrolled by a certain date, it will be cancelled.

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<tr>
<th>Course</th>
<th>Quarter(s) offered</th>
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<tr>
<td>CHEM 101</td>
<td>Fall and Winter</td>
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<td>CHEM 102</td>
<td>Winter and Spring</td>
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<td>CHEM 103</td>
<td>Spring and Summer</td>
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<td>CHEM 155</td>
<td>Summer and Fall</td>
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<td>CHEM 201</td>
<td>Summer, Fall, Winter</td>
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<td>CHEM 280</td>
<td>Spring</td>
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<td>CHEM 291A</td>
<td>Fall and Winter</td>
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<td>CHEM 291B</td>
<td>Winter and Spring</td>
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<tr>
<td>CHEM 292A</td>
<td>Winter and Spring</td>
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<tr>
<td>CHEM 292B</td>
<td>Spring, Summer, and Fall</td>
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<tr>
<td>CHEM 301</td>
<td>Spring, Summer, and Fall</td>
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<td>CHEM 316</td>
<td>Fall</td>
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<td>CHEM 318</td>
<td>Fall</td>
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<td>CHEM 327</td>
<td>Fall</td>
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<tr>
<td>CHEM 360</td>
<td>Spring</td>
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<tr>
<td>CHEM 401</td>
<td>Fall</td>
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<td>CHEM 402</td>
<td>Winter</td>
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<tr>
<td>CHEM 403</td>
<td>Spring</td>
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<tr>
<td>CHEM 411</td>
<td>Fall</td>
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<td>CHEM 412A</td>
<td>Winter (odd years)</td>
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<td>CHEM 412B</td>
<td>Spring (odd years)</td>
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<td>CHEM 415</td>
<td>Winter (even years)</td>
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<td>CHEM 418</td>
<td>Winter</td>
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<td>CHEM 420</td>
<td>Fall</td>
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<td>CHEM 425</td>
<td>Spring (odd years)</td>
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<td>CHEM 431A</td>
<td>Fall and Winter</td>
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<td>CHEM 431B</td>
<td>Winter and Spring</td>
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<tr>
<td>CHEM 432A</td>
<td>Winter and Spring</td>
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<td>CHEM 432B</td>
<td>Fall and Spring</td>
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<tr>
<td>CHEM 434</td>
<td>Fall</td>
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<td>CHEM 435</td>
<td>Fall</td>
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<td>CHEM 438</td>
<td>Winter (odd years)</td>
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<td>CHEM 444</td>
<td>Spring (even years)</td>
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<td>CHEM 462</td>
<td>Spring</td>
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<tr>
<td>CHEM 480</td>
<td>occasional</td>
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Please take account of these limitations in planning your schedule. In order to make it possible for you to finish in four years, you may enroll in CHEM 462 simultaneously with CHEM 401. Also, if you have completed the math and physics prerequisites to take CHEM 403, you may be allowed to take CHEM 412 AB before CHEM 401 or 402. A listing of Chemistry course offerings is posted outside the department office and is updated quarterly.
GRADUATION REQUIREMENTS

The following information is provided to help students plan their overall degree program, including components in the major and outside the major.

- WPE Writing Proficiency Exam. Consult the current schedule and catalog for information on the WPE. Students must pass ENGL101 and 102 (or equivalent, e.g., 190 that is no longer offered) with a grade of C or better before attempting the WPE. It is recommended that this exam be taken as soon as possible after ENGL102. A passing score on the WPE is a prerequisite for CHEM360 (Writing for Chemists). Also, students must pass the WPE prior to completion of 135 quarter units. Transfer students who have completed 135 quarter units upon entrance must pass the WPE during their first quarter in residence here. The exam takes 90 minutes and involves writing an essay in response to a short prompt. Dates and times are listed in schedule of classes. Registration is accomplished by enrolling in UNIV 400 using the same process as for all other courses. A fee (ca. $15.00) must be paid along with registration fees. Detailed information about the WPE is available at the Testing Office, Library South 2098.

- GE (General Education) requirements. For new non-transfer students, these requirements are outlined in the Catalog and the Schedule of Classes and have probably been sent to you with your acceptance materials. For transfer students who have not missed registration at their college or university more than one semester or two quarters, consult your Evaluation of Transfer Credit form, which lists the transfer courses for which credit has been given, the courses each student must take and the student’s GE catalogue date (if this date is prior to F98, the student is under the old GE requirements). For both the old and new programs, remember that ENGL102 is also a University requirement. Students must fulfill those requirements described in their catalog of record (for transfer students, see the above evaluation form for catalog of record). The mathematics and natural science components of the lower division GE program are fulfilled by courses required in the chemistry and biochemistry majors, except that chemistry majors need to take a biological science course with lab to complete their GE science requirement. Also, while science majors only require 8 units in section B, they must take 12 unit in both sections C and D. The basic subjects section of the GE program (ENGL101, COMM150, PHIL250,1 and MATH102) must be completed within the first 45 units that are counted towards the student’s baccalaureate degree. Students must take two diversity courses from anywhere within blocks B, C, D or their upper division theme. Also, a (C-) grade is not acceptable for ENGL102 and the basic subjects GE Courses (a (C-) is acceptable for all other GE courses so long as the average of all GE courses is 2.000 or better).

- Upper Division Theme. A 12 unit theme must be completed after reaching upper division standing (i.e., after 90 units). Before taking any upper division theme course a student must complete the basic subject’s part of the lower

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1PHIL 250 is the critical thinking course that the department recommends for this requirement. It is OK, however, if a student has already taken one of the other critical thinking courses such as COMM176 or POLS155.
division GE requirements as well as one course each of the blocks B, C, D and E. See the Academic Advisement resources for students for descriptions. Transfer students who are certified by a community college for their lower division GE, should consider choosing an upper division theme that contains diversity courses in two different theme subdivisions.

Students who choose the Ancients and Moderns Theme are prohibited from taking CHEM/HIST/PHIL 380N, Ancient and Modern Science. One of the other two Natural Sciences courses must be used instead.

• Upper Division Electives in the Major. It is important that these courses be selected jointly by the student and his/her advisor before the student enrolls in any elective course. Electives taken without the consent of the student's advisor may, in some cases, not be allowed on the student's degree program.

Upper Division Biology Electives for Biochemistry Majors. For students who declared a biochemistry major before Fall 2006, it is important that electives be chosen in consultation with the student's academic adviser, since there are restrictions on which courses are allowed (for students who declared the biochemistry major after Fall 2006, their elective choices are outlined in the current catalog). Courses in Biology for which no credit is allowed toward a Biology degree are not allowable as electives. Courses from other departments may be substituted for biology courses only with adviser approval. It is required that least one course in genetics and one course in physiology or development be included among the upper division electives. Those students who have finished Biochemistry (CHEM 431ABC) may, at the discretion of the instructor, be able to take an upper division biology electives without having completed all the normal prerequisites. For example, it may be possible to take BIOL417 without taking BIOL380 first.

Also, students who declared a biochemistry major prior to Fall 2006 are required to take PHYS 443AB, Biophysics, which are no longer offered. To substitute for PHYS 443AB, students must arrange with their adviser to take additional upper division courses in chemistry or biology. Students are encouraged to check with their academic adviser to assist them in making an appropriate choice before enrolling in a replacement course.

Upper Division Electives for Chemistry Majors. Only 3 units of CHEM 499 may be used to satisfy the elective requirement of the BS degree in chemistry. Courses with an "N" suffix, such as CHEM 380N, may not be used as electives. Students who declared a BS Chemistry major prior to Fall 2006 should include CHEM 435, Introduction to Biochemistry, in their electives if they want their BS degree to be ACS accredited.

• General Degree Requirements. The General Requirements for the Bachelor’s Degree include such factors as an overall 2.000 GPA, a grade of (C-) or higher in all courses required for the major, a GPA of 2.000 in the major and in the upper
division units in the major, a minimum of 45 units taken at Cal State LA, a minimum of 60 upper division units, and several other specific requirements. The catalog contains a complete description of these general graduation requirements, along with the general education and major requirements. All of these requirements should be carefully examined, since failure to meet any one of them will delay graduation. For example, a BA student may not qualify for graduation if that student has fewer than the 60 upper division units required by the University, even though that student has met all GE and major requirements.

• **Filing for graduation.** Two quarters before graduation students must complete and submit a graduation application package to the Department office. The package includes a Graduation Application form, a Bachelor's Degree Worksheet, and an online departmental survey. The process begins by paying the fee in the Cashier’s office for filing a Graduation Application. The student then makes an appointment with an adviser in the NSS Advisement Center. The NSS Advisor will complete the Bachelor's Degree Worksheet and the online record through GET. This step shows how specific graduation requirements, including major and general education courses, have been met. (For students who transferred from another campus, it is helpful to ensure that all transferred coursework has been applied properly to Cal State LA requirements by consulting an advisor well before the application process begins.) The student then completes the online departmental satisfaction survey, providing anonymous feedback to the department. At this point, the student can then make an appointment with the Department Chair for a final exit interview. At this interview, the Survey Completion Form, the Graduation Application form, and the Bachelor's Degree Worksheet are submitted to the Department for further processing.

When filing for graduation it is important to check that all degree requirements will be fulfilled by the proposed graduation date, including lower division GE requirements, the upper division GE theme, major requirements, and the general requirements for the bachelor's degree.

It is very important to note that once a student files to graduate in a particular quarter, the financial aid office will stop offering that student financial aid after that target graduation date. Thus, the student should be fairly certain that he/she will finish in the quarter the student applied for.

• **Dual Majors.** In order to initiate a dual major, the student must inform both departments in writing and copy the Graduation Office. The Change of Major Form is usually used with both departments signing and stamping the form. Clearly all requirements of both majors must be satisfied, however, the University also requires that the student complete a course or courses required by both majors during the quarter that he/she plans to graduate. Otherwise, the student will end up with a degree in a single major - the one that was completed first.

• **Credential Requirements.** Students interested in fulfilling requirements for a teaching credential, or for a BS degree in Natural Science should see Dr. Rudd in ASCB 121A.
ADDITIONAL RESOURCES AND SUPPORT FOR STUDENTS

The Department of Chemistry and Biochemistry hosts annual events for students, including a Fall Reception to welcome new students and reacquaint students and faculty. In addition, the Department hosts a Spring Awards Ceremony to recognize the many accomplishments of our students.

Several groups and programs offer free tutoring and/or career counseling. Among these are:

University Tutorial Center, JFK Library, Palmer Wing 1039. The University Tutorial Center’s mission is to help Cal State L.A. students to better prepare, improve their knowledge and understanding, and develop the skills necessary to succeed in college. There is tutoring for specific courses, as well as free Study Skills Presentations each quarter (College Success Series). (323) 343-3971

Chemistry & Biochemistry Club. This Student Affiliate Chapter of the American Chemical Society has various activities that may include study groups, sharing of notes, free tutoring, visits to industry, career information, and information about graduate schools.

Health Careers Advisement Office (HCAO). Provides information and faculty-led 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.

Pre-Pharmacy Student Association. This student club offers various activities, including career information seminars, for students interested in applying to pharmacy schools.
RESEARCH OPPORTUNITIES

The Chemistry & Biochemistry Department at Cal State LA has a strong tradition of involving undergraduate students in research projects. Student research is conducted under the supervision of a faculty member, and provides an excellent way to study advanced topics in chemistry and biochemistry, to learn experimental techniques and to participate in the scientific investigation of an interesting topic.

• How to get involved:

**CHEM 499** - Requires a 2.5 GPA in chemistry courses or one advanced laboratory course elective, and the consent of instructor to act as sponsor. An enrollment form is available in the department office. This course is graded with a letter grade, based upon the student’s efforts and accomplishments, as reflected in a written report.

**Honors Program (CHEM 196 and 396)**. Entry into this research program requires a 3.0 GPA in all college work and in chemistry, averaged separately, and recommendations from at least two faculty members and approval of the application at a department meeting of the faculty. Honors students must write a thesis based on their research and pass an oral examination relating to their project. Students should take CHEM 196 every quarter that they are in the program (except for summer quarters when weekly departmental seminars are not scheduled). Students should also note that only 5 units of CHEM396 are allowed to be taken on the program. Students who complete this program graduate with departmental honors. See the Honors Thesis Advisor for details.

• Support for Student Research.

Minority Opportunities in Research (MORE) Programs. Provides research opportunities and financial support for students in a variety of disciplines through the RISE, MARC and Bridges to the Future Programs. For details see Dr. Gutierrez (ASCB 221C) or Ms. Bautista (Program office, BIOS 16).

Other research grants. Consult individual faculty members about the availability of financial support for students involved in their research programs.

• Faculty and Active Research Areas

**YONG BA** (Ph. D. Gerhard-Mercator University, Duisburg) Development and applications of magnetic resonance techniques (NMR and EPR) for the study of physicochemical properties of biomedically related macromolecules, hydrogel systems and nano-structured drug delivery carriers.

**KRISHNA FOSTER** (Ph.D., University of Colorado, Boulder) Photochemistry and kinetics studies of heterogeneous systems using HPLC and mass spectroscopy. Projects explore the photodegradation of environmental pollutants.
RAYMOND E. GARCIA (Ph.D., Univ. of California, Riverside) Regulation of plasma lipoprotein, lipid, and apolipoprotein metabolism by dietary and hormonal factors.

HAROLD GOLDWHITE (Ph.D., Cambridge Univ.) History of Chemistry.

FRANK A. GOMEZ (Ph.D., Univ. of California, Los Angeles) Biological applications of capillary electrophoresis (CE) with a particular interest in molecular recognition and analysis of in-capillary enzyme-mediated transformations.

CARLOS G. GUTIERREZ (Ph.D., Univ. of California, Davis) Synthetic organic chemistry. Synthesis of natural and designed molecules for high affinity complexation of ferric ion as probes in the study of iron aquisition, transport and utilization in bacteria. Development of ligands potentially useful as therapeutic agents in the management of disease resulting from iron or actinide overload.

ALISON McCURDY (Ph.D., Caltech) Bioorganic chemistry; organic synthesis. The design, synthesis, and characterization of molecules capable of photoreversible binding and release of calcium ions to study how cells respond to hormonal stimulation.

JAMIL MOMAND (Ph.D., Univ. of California, Los Angeles) Redox regulation of signal transduction pathways with a particular emphasis on the p53 tumor suppressor protein. Development of new assays for quantitative and qualitative analysis of oxidation reactions of protein amino acid residues.

SCOTT NICKOLAISEN (Ph.D., Univ. of Southern California) Kinetic study of the gas phase photolysis of alkanes using flash photolysis/infrared photochemical techniques.

JAMES RUDD (Ph.D. Iowa State University) My research interests include the study and development of science instruction that promotes active learning through the use of writing tasks, guided-inquiry methods, collaborative learning environments, and computer-based instruction; investigation of the nature, roles, and impact of science faculty specializing in science education.

MATTHIAS SELKE (Ph.D., Univ. of California, Los Angeles) Mechanistic organic, bioorganic, and organometallic chemistry, models for oxygen activation in enzymatic reactions. Organic and organometallic photochemistry. Chemistry of singlet oxygen.

WAYNE TIKKANEN (Ph.D., Univ. of California, Santa Barbara) Use of asymmetric zirconocene complexes in stereospecific synthesis; synthesis and characterization of heterobinuclear transition metal complexes.

LINDA TUNSTAD (Ph.D., Univ. of California, Los Angeles) Synthetic organic chemistry; Synthesis of "container" molecules with an enforced cavity for molecular complexation studies.
ROBERT L. VELLANOWETH (Ph.D., Univ. of California, Berkeley)  
Characterization of the biochemical and molecular genetic basis for the annual life history pattern in *Arabidopsis thaliana*. Discovery of lipid-based signals, their protein carriers, and the genetic regulation of the “death hormone” system that governs life span in annual plants; Investigations into human migration patterns along the western North American coast during the Holocene epoch using ancient DNA and isotopic ratio analyses of archaeological artifacts.

XIN WEN (Ph. D., University of Rochester)  My research interests are at the chemistry-biology interface. We aim to understand molecular recognition events in protein-ligand complexes by integrating molecular biology techniques with biophysical/bioanalytical methods. Currently, two biological systems are focused: (1) antifreeze protein and small molecular enhancers; and (2) zinc finger protein and toxic metal ions.

FEIMENG ZHOU (Ph.D., University of Texas, Austin)  Developing various sensitive instrumental methods to analyze environmentally and biologically important species using electrochemical and inductively coupled plasma atomic emission spectroscopic methods. Also, developing electrochemically-based biosensors.
APPENDIX
PERSONNEL

Department Chair: Dr. Robert Vellanoweth
Undergraduate Honors Thesis Advisor: Dr. Matthias Selke

Faculty, Full-time (Field)

Dr. Yong Ba (Physical Chemistry)
  Office: CSWB 122B; Lab: CSWB 148/155
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Dr. Donald Paulson (Organic Chemistry). EMERITUS  
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Dr. Stanley Pine (Organic Chemistry) EMERITUS  
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Phone: (323) 343-2395  

Ms. Karla Carias (MORE Programs)  
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Ms. Maribel Estrada  
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Phone: (323) 343-2300  

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Dr. Errol Mathias (Manager of Instructional Laboratories)  
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Phone: (323) 343-5648  

Ms. Jesse Murillo (Administrator Coordinator)  
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Phone: (323) 343-2300  

Mr. Floyd Nesbitt (Electronics Technician)  
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Phone: (323) 343-2379  

Mr. William Wimberley (Stockroom Manager)  
Office: CSWB 251  
Phone: (323) 343-2345
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.

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You can use blank planners (from the University Tutorial Center – go to the Handouts/Downloads page) to help you be more successful. For example, you can keep track of appointments and classes, avoid “double booking”; schedule your study time. You can use blank planners so you can plan ahead for important deadlines or events of the quarter. You will be able to plan ahead and prepare for weeks in which many deadlines or assignments or tests will take place. The University Tutorial Center also has a variety of daily, weekly, and monthly planners.