

# PRE-PHARMACY: ACADEMIC AND CAREER INFORMATION



Health Professions Advising Office (HPAO) • Jensen Student Access to Science (SAS) and Mathematics Center

• Location: Faculty Office 5 Building – Room 109 • Phone: (562) 985-5720 • Website: [www.sascenter.org/hpao](http://www.sascenter.org/hpao)

## NATURE OF THE WORK, EARNINGS AND OCCUPATIONAL OUTLOOK

Pharmacists are health professionals who are concerned with serving the pharmaceutical needs of patients and communities. The American Association of Colleges of Pharmacy reports the principal goal of pharmaceutical care is “to achieve positive outcomes from the use of medication which improves patients’ quality of life. These outcomes include: cure of a disease, elimination or reduction of symptoms, arresting or slowing a disease process, prevention of disease, diagnosis of disease, and desired alterations in physiological processes, all with minimum risk to patients.” As a result of society’s changing health and social issues, Pharmacists today do much more than simply compound and dispense medication. Their roles have broadened to include direct patient care, education, and case management duties.

Pharmacists can be found in a variety of settings including community and consultant pharmacies, hospitals and institutions, managed care organizations, the pharmaceutical industry, academics and research, government agencies and many more. The most common setting is community pharmacies, which include independent, prescription only pharmacies, such as those found in medical office buildings, and chain pharmacies (local drug stores), which generate income from the sale of other merchandise. Opportunities are becoming increasingly available for pharmacists with advanced training to work as clinical pharmacists in recognized pharmacy practitioner specialties such as ambulatory care, clinical pharmacokinetics, geriatrics, oncology, psychopharmacology, drug information, and nutrition support. The advanced training for such programs usually requires a fellowship or residency after the Pharm.D. degree.

The Occupational Outlook Handbook (2010-2011) reports that employment of pharmacists is expected to grow faster than the average for all occupations through the year 2018 due to the increased pharmaceutical needs of a larger and older population and greater use of medications. The median annual of wage-and-salary pharmacists in May 2008 were \$106,410. The middle 50% earned between \$92,670 and \$121,310 a year. Salaries vary by work setting and geographic location.

## PHARMACY EDUCATION

Currently there are 110 accredited pharmacy programs offering the Doctor of Pharmacy (Pharm.D.) professional degree. The Pharm.D. is a four-year program that produces a scientifically and technically competent pharmacist that can use their knowledge to provide maximum health care services to patients. Pharmacy students gain experience in patient-centered learning experiences and in working in close, cooperative relationships with health practitioners. After completing a Pharm. D. degree, graduates have the option to pursue residency training in institutional and community pharmacy practice.

## PRE-PHARMACY PREPARATION

Requirements for admission to colleges of pharmacy vary. The vast majority of students who enter a pharmacy program have completed a minimum of three years of pre-pharmacy courses or a bachelor’s degree. Common coursework completed includes calculus, inorganic chemistry, organic chemistry, biology, physics, and additional courses in the humanities and social sciences. Many programs outside of California require applicants to take the Pharmacy College Admissions Test (PCAT) offered four times a year in January, June, August and October. No California Pharm.D. program

currently require the PCAT. Programs select applicants based on a variety of characteristics, including academic background, clinical experience, personal statement, interview, letters of recommendation and personal qualities including motivation, communication, critical thinking skills, and empathy. Some schools set minimum prerequisite and cumulative GPA requirements that vary between 2.4 and 3.0. Most schools expect applicants to gain first-hand paid or volunteer experience in a pharmacy setting to confirm their interest in the pharmacy profession. As pharmacists become more involved in educating patients, communication and interpersonal skills are increasingly important to demonstrate.

#### MAJOR:

No particular major is required or preferred for pharmacy school admissions, thus students are advised to select a major they find interesting and in which they can excel. Students should also consider a major that may lead them to an alternate career, should they decide not to pursue the field of pharmacy. Whichever major a student declares, their course of study must incorporate the required pre-medical requirements. Many students who select a science major find a great deal of overlap between their major requirements and those required for medical school. Regardless of the choice in major, medical schools prefer that students have a well-rounded liberal arts education.

#### COURSE REQUIREMENTS FOR CALIFORNIA PHARMACY SCHOOLS:

Below is a list of requirements for the 8 Pharmacy programs in California. Students maintain responsibility for verifying course selection with individual Pharmacy programs. For further information on these programs or Pharmacy programs outside of California, consult the [Pharmacy School Admissions Requirements](#) book, available at [www.aacp.org](http://www.aacp.org).

#### CSULB Courses that fulfill admission requirements for the [University of California, San Diego](#):

Pre-pharmacy Coursework	CSULB Courses
<b>One year of General Chemistry with lab</b>	Chemistry 111A & 111B
<b>One year of Organic Chemistry with lab</b>	Chemistry 320A & 320B ( <i>Chem. &amp; Biochem. majors</i> ) <b>OR</b> 322A w/ 323A & 322B w/ 323B ( <i>Biology &amp; other majors</i> )
<b>One year of Calculus</b>	Math 122 & 123 <b>OR</b> Math 119A & 119B
<b>One year of General Physics (Only 1 lab)</b>	Physics 100A & 100B <b>OR</b> 151 & 152
<b>One year of General Biology with lab</b>	Biology 211 & 212 & 213 (Biology 111 w/ 111L & 212 w/ 212L & 213 w/ 213L if taken prior to catalog year 2010-11)
<b>One year of English</b>	English 100 <b>OR</b> Asam 100 <b>OR</b> Chls 104 <b>OR</b> Afrs 100 & Engl 101 <b>OR</b> 102 <b>OR</b> 300
<b>One course of Public Speaking</b>	Communication 130
<b>One course of Macro OR Micro Economics</b>	Economics 100 <b>OR</b> 101
<b>One elective course</b>	Psychology 100 <b>OR</b> Sociology 100 <b>OR</b> Anthropology 120

#### CSULB Courses that fulfill admission requirements for the [University of California, San Francisco](#):

Pre-pharmacy Coursework	CSULB Courses
<b>One year of General Chemistry with lab</b>	Chemistry 111A & 111B
<b>One year of Organic Chemistry with lab</b>	Chemistry 320A & 320B ( <i>Chem. &amp; Biochem. majors</i> ) <b>OR</b> 322A w/ 323A & 322B w/ 323B ( <i>Biology &amp; other majors</i> )
<b>One year of Calculus</b>	Math 122 & 123 <b>OR</b> Math 119A & 119B
<b>One year of General Physics (Only 1 lab in electricity &amp; magnetism)</b>	Physics 100A & 100B <b>OR</b> 151 & 152 (strongly recommended)
<b>One year of General Biology (Only 1 lab)</b>	Biology 211 & 212 & 213 (Biology 111 & 212 & 213, w/

	111L <b>OR</b> 212L <b>OR</b> 213L, if taken prior to catalog year 2010-11)
<b>One course of Mammalian Physiology</b>	Biology 207 <b>OR</b> 342
<b>One year of English</b>	English 100 <b>OR</b> Asam 100 <b>OR</b> Chls 104 <b>OR</b> Afrs 100 & Engl 101 <b>OR</b> 102 <b>OR</b> 300
<b>One course of Public Speaking</b>	Communication 130
<b>One course of Macro OR Micro Economics</b>	Economics 100 <b>OR</b> 101
<b>One elective course</b>	Psychology 100 <b>OR</b> Sociology 100 <b>OR</b> Anthropology 120
<b>Computer Literacy</b>	<a href="http://pharmacy.ucsf.edu/pharmd/admissions/steps/1/literacy/">http://pharmacy.ucsf.edu/pharmd/admissions/steps/1/literacy/</a>

**CSULB Courses that fulfill admission requirements for the California Northstate College of Pharmacy:**

Pre-pharmacy Coursework	CSULB Courses
<b>One year of General Chemistry with lab</b>	Chemistry 111A & 111B
<b>One year of Organic Chemistry with lab</b>	Chemistry 320A & 320B ( <i>Chem. &amp; Biochem. majors</i> ) <b>OR</b> 322A w/ 323A & 322B w/ 323B ( <i>Biology &amp; other majors</i> )
<b>One course of Biochemistry or Cell &amp; Molecular Biology</b>	Chemistry 441A <b>OR</b> 448 <b>OR</b> Biology 340
<b>One year of General Biology with lab</b>	Biology 211 & 212 & 213 (Biology 111 w/ 111L & 212 w/ 212L & 213 w/ 213L, if taken prior to catalog year 2010-11)
<b>One course of Microbiology</b>	Microbiology 200 <b>OR</b> 211
<b>One course of General Physics with lab</b>	Physics 100A <b>OR</b> 151
<b>One course of Physiology</b>	Biology 207 <b>OR</b> 342
<b>One course of Calculus</b>	Math 122 <b>OR</b> Math 119A
<b>One course of Statistics</b>	Biology 260 <b>OR</b> Stat 108
<b>One course of Public Speaking</b>	Communication 130
<b>One course of Macro OR Micro Economics</b>	Economics 100 <b>OR</b> 101
<b>One course of Psychology</b>	Psychology 100

**CSULB Courses that fulfill admission requirements for the Loma Linda University:**

Pre-pharmacy Coursework	CSULB Courses
<b>One year of General Chemistry with lab</b>	Chemistry 111A & 111B
<b>One year of Organic Chemistry with lab</b>	Chemistry 320A & 320B ( <i>Chem. &amp; Biochem. majors</i> ) <b>OR</b> 322A w/ 323A & 322B w/ 323B ( <i>Biology &amp; other majors</i> )
<b>One course of Biochemistry</b>	Chemistry 441A <b>OR</b> 448
<b>One year of General Biology with lab</b>	Biology 211 & 212 & 213 (Biology 111 w/ 111L & 212 w/ 212L & 213 w/ 213L, if taken prior to catalog year 2010-11)
<b>One course of Microbiology</b>	Microbiology 200 <b>OR</b> 211
<b>One year of General Physics with lab</b>	Physics 100A & 100B <b>OR</b> 151 & 152
<b>One course of Anatomy</b>	Biology 208
<b>One course of Calculus (4 units)</b>	Math 122 <b>OR</b> Math 119A & 119B
<b>One course of Public Speaking</b>	Communication 130
<b>One course of Macro OR Micro Economics</b>	Economics 100 <b>OR</b> 101
<b>One course of Psychology</b>	Psychology 100

**CSULB Courses that fulfill admission requirements for the University of Southern California:**

Pre-pharmacy Coursework	CSULB Courses
<b>One year of General Chemistry with lab</b>	Chemistry 111A & 111B
<b>One year of Organic Chemistry with lab</b>	Chemistry 320A & 320B ( <i>Chem. &amp; Biochem. majors</i> ) <b>OR</b>

	322A w/ 323A & 322B w/ 323B ( <i>Biology &amp; other majors</i> )
<b>One course of Biochemistry</b>	Chemistry 441A <b>OR</b> 448
<b>One course of Calculus</b>	Math 122 <b>OR</b> Math 119A <b>OR</b> 119B
<b>One course in Statistics</b>	Biology 260 <b>OR</b> Statistics 108 <b>OR</b> Psychology 210
<b>One course of General Physics with lab</b>	Physics 100A <b>OR</b> 100B <b>OR</b> 151 <b>OR</b> 152
<b>One year of General Biology with lab</b>	Biology 211 & 212 & 213 (Biology 111 w/ 111L & 212 w/ 212L & 213 w/ 213L, if taken prior to catalog year 2010-11)
<b>One course in Molecular Biology</b>	Biology 340 <b>OR</b> 370
<b>One course of Physiology</b>	Biology 207 <b>OR</b> 342 <b>OR</b> 345
<b>One course of Microbiology</b>	Microbiology 200 <b>OR</b> 211
<b>One course of Psychology OR Sociology</b>	Psychology 100 <b>OR</b> Sociology 100
<b>One course of Microeconomics</b>	Economics 101
<b>One year of English (Required for students without a Bachelor's degree from a U.S. university)</b>	English 100 <b>OR</b> Asam 100 <b>OR</b> Chls 104 <b>OR</b> Afrs 100 & Engl 101 <b>OR</b> 102 <b>OR</b> 300
<b>One course of Interpersonal Communication OR Public Speaking (Required for students without a Bachelor's degree from a U.S. university)</b>	Communication 110 <b>OR</b> 130

**CSULB Courses that fulfill admission requirements for the University of the Pacific:**

Pre-pharmacy Coursework	CSULB Courses
<b>One year of General Chemistry with lab</b>	Chemistry 111A & 111B
<b>One year of Organic Chemistry with lab</b>	Chemistry 320A & 320B ( <i>Chem. &amp; Biochem. majors</i> ) <b>OR</b> 322A w/ 323A & 322B w/ 323B ( <i>Biology &amp; other majors</i> )
<b>One course of Calculus</b>	Math 115 <b>OR</b> Math 119A <b>OR</b> 122
<b>One course of General Physics with lab</b>	Physics 100A <b>OR</b> 151
<b>One year of General Biology with lab</b>	Biology 211 & 212 & 213 (Biology 111 w/ 111L & 212 w/ 212L & 213 w/ 213L, if taken prior to catalog year 2010-11)
<b>One course of Microbiology</b>	Microbiology 200 <b>OR</b> 211
<b>One Year of English</b>	English 100 <b>OR</b> Asam 100 <b>OR</b> Chls 104 <b>OR</b> Afrs 100 & Engl 101, 102, 300, 310, 317, 410/510, 411/511, 419, 488, 491 (Select any two courses)
<b>One course of Public Speaking</b>	Communication 130 <b>OR</b> 335
<b>One course of Economics</b>	Macroeconomics 100 <b>OR</b> 300
<b>One course of Psychology</b>	Psychology 100 <b>OR</b> 370

**CSULB Courses that fulfill admission requirements for Touro University:**

Pre-pharmacy Coursework	CSULB Courses
<b>One year of General Chemistry with lab</b>	Chemistry 111A & 111B
<b>One year of Organic Chemistry with lab</b>	Chemistry 320A & 320B ( <i>Chem. &amp; Biochem. majors</i> ) <b>OR</b> 322A w/ 323A & 322B w/ 323B ( <i>Biology &amp; other majors</i> )
<b>One course of Calculus</b>	Math 119A <b>OR</b> 122
<b>One course of Human Anatomy with lab</b>	Biology 208
<b>One course of Human Physiology with lab</b>	Biology 207 <b>OR</b> 342 w/ 342L
<b>One course of Microbiology</b>	Microbiology 200 <b>OR</b> 211

CSULB Courses that fulfill admission requirements for Western University of the Health Sciences:

Pre-pharmacy Coursework	CSULB Courses
<b>One year of General Chemistry with lab</b>	Chemistry 111A & 111B
<b>One Year of Organic Chemistry with lab</b>	Chemistry 320A & 320B ( <i>Chem. &amp; Biochem. majors</i> ) <b>OR</b> 322A w/ 323A & 322B w/ 323B ( <i>Biology &amp; other majors</i> )
<b>One Year of Biochemistry</b>	Chemistry 441A & 441B <b>OR</b> 441A & 447, <b>OR</b> 448 & Bio 340
<b>One course of Microbiology</b>	Microbiology 200 <b>OR</b> 211 <b>OR</b> 320
<b>One course of Anatomy</b>	Biology 208
<b>One course of Human Physiology with lab</b>	Biology 207 <b>OR</b> 342 w/ 342L
<b>One course of Calculus</b>	Math 115 <b>OR</b> 119A <b>OR</b> 119B <b>OR</b> 122 <b>OR</b> 123
<b>One year of English</b>	English 100 <b>OR</b> 101 <b>OR</b> 102 <b>OR</b> 205 <b>OR</b> 206 <b>OR</b> 300 <b>OR</b> 317 <b>OR</b> 320
<b>One course of Psychology</b>	Psychology 100
<b>One course of Public Speaking</b>	Communications 130
<b>One course of Macro OR Micro Economics</b>	Economics 100 <b>OR</b> 101

## APPLICATION

Pharmacy College Application Service (PharmCAS), is a centralized web-based application service for applicants to pharmacy colleges and schools allowing applicants to submit one application and apply to multiple first-year professional pharmacy degree programs. Currently, 95 programs participate in PharmCAS. Applicants to programs that do not participate in PharmCAS should apply directly to each institution using the traditional application process. All of the CA pharmacy programs participate in the PharmCAS application service. For more information and a list of schools participating, please visit the PharmCAS web site at [www.pharmcas.org](http://www.pharmcas.org).

*For more information about Pharmacy, visit [www.aacp.org](http://www.aacp.org) and see your HPAO advisor for further information on the application process, application assistance, and a list of upcoming workshops and events.*