Pharmaceutical Sciences is a dynamic, new major that takes an interdisciplinary approach to the study of the discovery, development, and use of drug therapies to treat diseases.

Degree offered
Pharmaceutical Sciences B.S.

Major Overview

The Pharmaceutical Sciences Department offers a Bachelor’s of Science degree that brings together the many scientific disciplines that make up Pharmaceutical Sciences to provide a unified view of the field. This highly interdisciplinary major teaches our students the relevant basics of chemistry, biology, engineering, and computer science and then shows how such diverse scientific disciplines are woven together in the search for new and better medicines. Students who obtain a Bachelor’s degree in Pharmaceutical Sciences will be in a strong position to move directly to research positions in pharmaceutical or biotechnology companies or to continue their education in a graduate PhD program, medical school, or pharmacy school.

What are the Pharmaceutical Sciences?

Drug Discovery and Design
Drug Discovery and Design deals with the design and synthesis of new drug molecules. This category includes specialized fields of study such as medicinal chemistry, combinatorial chemistry, structural biology, identification of biological targets, and assay development to test drug candidates.

Drug Delivery
Drug Delivery is concerned with the design of dosage forms -- such as tablets, injections or patches -- that will deliver the drug to the site of action in a patient. The purpose is to ensure that the drug arrives in the right concentration and at the right time. Specialty fields within Drug Delivery include pharmaceutics, biomaterials, and pharmacokinetics.

Mechanism of Drug Action
Drug Action examines how the drug itself actually works in a living system, which is the definition of pharmacology. The action of the drug can be studied at the molecular level, in a cell, an organ, and in animals. Specialty fields within Drug Action include molecular biology, pharmacology, pharmacodynamics, toxicology, and biochemistry.

Clinical Sciences
Clinical Sciences are concerned with the use of drugs in the treatment of diseases. Particular properties of new drugs -- such as efficacy, adverse effects, drug-to-drug interaction, bioavailability -- are determined in clinical trials in humans.

Pharmacoeconomics
Cost Effectiveness of Medicines (Pharmacoeconomics) examines the economic savings from the use of one drug rather than others, with regard to costs for the drug itself and patient management (e.g., compliance, quality of life, physician visits, potential hospitalization).

Regulatory Affairs
Regulatory Affairs promotes communication, understanding, and cooperation between scientists from industry and academia and the regulatory authorities worldwide who govern approval and distribution, by means of developing regulatory guidelines.
Special Opportunities and Resources

Undergraduate Research
Through our Undergraduate Research course, Pharm Sci 199, students have the opportunity to work directly with faculty and conduct research in their labs while earning college credits. Almost all Pharmaceutical Sciences graduates have engaged in research with a faculty member during their time at UCI. Although it is not a requirement of the major, the Pharmaceutical Sciences department strongly recommends and encourages students to get involved with research as soon as possible, as it helps to clarify educational and occupational goals, and provides valuable preparation for graduate school and careers in industry. In addition to Pharm Sci 199, students can also get involved with research through summer opportunities and other on-campus programs through UROP.

Education Abroad Program
The Department of Pharmaceutical Sciences encourages students in all majors to enhance their UCI education by studying abroad. There are programs for every major, and opportunities in more than 50 countries. Early academic planning is highly recommended so that you can find a program that is best suited for your study abroad goals and graduation timeline. A popular program for Pharmaceutical Sciences students is the summer abroad in Sussex, England. During this 8-week program, students complete an entire year of calculus-based Physics and labs equivalent to the required Physics courses for the Pharmaceutical Sciences major. Financial aid, including scholarships, grants, and loans, apply to most study abroad programs. Studying abroad helps UCI graduates achieve the academic, personal, and professional skills necessary to be well-informed, engaged members of the global society. For detailed information about all of the study abroad opportunities, go to UCI’s Center of International Education: www.cie.uci.edu.

Careers and Professional Opportunities

Graduates of the Pharmaceutical Sciences major will be strong candidates for entry-level positions with pharmaceutical and biotechnology companies, research associate positions in academia or industry, regulatory scientists for agencies like the Food and Drug Administration (FDA), and even researcher positions in national laboratories, such as the National Institutes of Health (NIH). Students with a B.S. in Pharmaceutical Sciences will also be prepared to continue their education through graduate and professional degree programs, such as:

- Ph.D. programs in Pharmacology, Chemistry, etc.
- Pharm.D.
- M.D.
- D.D.S.
- M.S.