

Pharmaceutical Chemistry B.S.

1. General description and characteristics of the program.

Pharmaceutical Chemistry is the study of the molecular and mechanistic aspects of pharmaceuticals. The discipline emphasizes the chemistry of drug design and development, drug action, drug transport, drug delivery, and targeting. The development of new pharmaceuticals is critically dependent on a molecular-level understanding of biological processes and mechanisms of drug action. Progress in the field now depends on the design and synthesis of new molecules using tools such as structure activity relationships, combinatorial chemistry, and computer-aided drug design. In recent years rational design of drugs tuned to specific target sites is becoming a reality due to concurrent advances in chemistry and biology, including elucidation of the human genome. Chemists continue to be at the forefront of drug design, synthesis, testing, and development. A bachelor's program in Pharmaceutical Chemistry will emphasize the molecular basis underlying the creation of new drugs and health applications of bioactive compounds. The proposed program will prepare students to fully and confidently participate in health and biomedical careers.

2. Rationale

The pharmaceutical industry is a major employer of chemists; in recent years more than 20% of graduates with BS and Ph.D. degrees in chemistry work in the pharmaceutical industry. Pharmaceutical companies need employees with strong skills in modern chemical techniques as well as a good understanding of biomedical issues such as drug action, drug design and drug development. Students are increasingly career-oriented and are motivated by early exposure to applications of their studies. Although the proposed program in Pharmaceutical Chemistry suggests a clear career goal, it includes sufficient grounding in fundamental chemistry to allow graduates flexibility if their career plans change.

Graduates of this program will have a solid foundation in basic chemistry with a focus on pharmaceutical applications. They will have skills necessary to work productively in the pharmaceutical industry, especially in the areas of research and development. Those seeking further education will be prepared for graduate work in chemistry or biochemistry, or professional programs in pharmacy or other health sciences.

Degrees of this type, combining basic science with real-world applications, are an ideal preparation for medical school or law school. (Pharmacy schools, of course, are not excluded, but they usually only require for a pre-pharmacy curriculum completion of the sophomore year or approximately 70 semester hours at an institution of higher learning - although the acquisition of a baccalaureate degree is often considered a plus in applying to pharmacy school, and graduates are ranked higher during the initial screening.) In addition, pharmaceutical chemistry will provide an excellent groundwork for careers in patent law.