HOWARD PAYNE UNIVERSITY

THE SCHOOL OF SCIENCE & MATHEMATICS

CHEMISTRY

OVERVIEW

The purpose of the School of Science and Mathematics is to provide programs and coursework to students in the fields of science, engineering, technology, and mathematics. The school also contributes course offerings for HPU's liberal arts and sciences general education curriculum. Undergraduate degrees are offered in the areas of biology, biomedical engineering, biomedical science, chemistry (with concentrations in biochemistry and forensic science), computer information systems, engineering science, information systems management, mathematics and software engineering.

COURSES DESCRIPTIONS

CHE 1101-4609: Special Studies

Special courses not a part of the regular schedule, offered on an irregular schedule.

CHE 1105: Chemical Calculations I

Problem-solving techniques for CHE 1479 General Chemistry I. One-hour lecture per week. Fall.

CHE 1106: Chemical Calculations II

Problem-solving techniques for CHE 1489 General Chemistry II. One-hour lecture per week. Spring.

CHE 1130: Chemical Calculations For Non-Majors

Discussion of materials and problem-solving techniques for CHE 1430. Introduction to Organic and Biological chemistry. One-hour lecture per week. Spring.

CHE 1429: Fundamentals Of Chemistry I

A foundational chemistry course designed for preparing students for General Chemistry 1479 as well as Chemistry 1430 and for students in non- science majors who do not need an extensive chemistry background. The course includes the structure, properties and changes in matter, quantitative relationship in reactions, solutions, equilibrium, kinetics, pH, buffers and nuclear chemistry. This course fulfills the general education curriculum requirements for a lab science course. Not recommended for science majors or pre-professional students in health-related fields. Does not meet prerequisites for CHE 1489 or CHE 2331. Three hours of lecture and two hours of laboratory per week. Fall, Summer.

CHE 1430: Introduction To Organic And Biological Chemistry
An analysis of the chemical processes that are important to biological systems. The course will cover organic, biochemical, and food/physiological chemistry as it pertains to the human body including, but not limited to, structural analysis of organic molecules and macromolecules, protein interactions, and biological metabolism. This course fulfills the general education curriculum requirements for a lab science course. Three hours of lecture and two hours of laboratory per week. Spring, Summer.

CHE 1479, 1489: General Chemistry I, II
A study of the fundamentals of chemistry with emphasis on atomic structure, chemical bonding, the periodic system, descriptive inorganic chemistry, equilibria and elementary thermodynamics of chemical systems. Three hours lecture and three hours laboratory per week. Concurrent enrollment in CHE 1105 and CHE 1106 respectively is highly recommended. CHE 1479, Fall, Spring; CHE 1489, Spring, Summer.

CHE 2139, 2149: Organic Chemistry Laboratory I, II
A two-semester study of the laboratory techniques and methods used in modern organic chemistry. Three hours of laboratory per week. CHE 2139, Fall. Summer; CHE 2149, Spring, Summer.

CHE 2331, 2341: Organic Chemistry I, II
A study of organic chemistry emphasizing nomenclature, bonding, structural relationships to reactions; reaction types and mechanisms and synthetic methods. CHE 2331, Fall; CHE 2341, Spring.

CHE 3001: Laboratory Assistant Internship
Students will gain experience in preparing, conducting, and evaluating laboratory studies.

CHE 3101, 3201, or 3301: Chemistry Laboratory Internship
A student undertakes an internship program in a company in which the operation is STEM (Science, Technology, Engineering and Mathematics) related. A site supervisor representing the company and academic advisor are appointed. The student is required to submit an abstract of proposed work/project for approval prior to beginning the internship. The student will orally present a report of the

internship to a committee of at least three faculty and one student, including the academic advisor. The site supervisor is to provide a written evaluation of work performance of the intern. Forty-five clock hours of service per credit hour are required. No more than four hours may apply toward a Chemistry degree. (Courses may be repeated for credit, but only four hours of STEM internship will apply to the Chemistry degree.) Fall, Spring, Summer.

CHE 3119, 3129: Physical Chemistry Laboratory I, II
An introduction to the equipment, methods and laboratory skills needed in modern physical chemistry. Three hours of laboratory per week. CHE 3119, Fall, odd years; CHE 3129, Spring, even years.

CHE 3311, 3321: Physical Chemistry I, II
A two-semester study of the physical properties and structure of matter together with chemical interactions from the perspectives of thermodynamics, quantum mechanics, chemical kinetics and symmetry. Three hours lecture per week. CHE 3311, Fall, odd years; CHE 3321, Spring, even years.

CHE 3469: Quantitative Chemistry
The theory and practice relating to the major analytical techniques in chemistry will be studied. These include gravimetric, volumetric, electrochemical and colorimetric methods of analysis. Three hours of lecture and four hours of laboratory per week. Fall, even years.

CHE 4381: Advanced Inorganic Chemistry
A study of the chemistry of the main group elements including bonding, symmetry, periodic properties, and the chemistry of the transition elements. Three hours of lecture per week. As needed.

CHE 4389: Environmental Chemistry
This course explores the fundamental chemistry evident in prevalent environmental issues. Topics will include both anthropogenic and natural phenomena that affect water, air and soil condition. Current domestic and global environmental concerns will be analyzed by comparison of popular media representations with scientific literature and published data. Application of analytical chemistry to the study of these issues will be demonstrated. Two hours of lecture and two hours of laboratory per week. As needed.

CHE 4439, 4449: Biochemistry I, II

Chemical studies of biological processes emphasizing conformation, metabolism, biosynthesis, genetic information and molecular physiology. Three hours lecture and three hours laboratory per week. CHE 4439, Fall, even years; CHE 4449, Spring, odd years.

CHE 4469: Instrumental Analysis
The study of the principles upon which instrumentation is based along with the practical application of spectral interpretation. Three hours of lecture and three hours of laboratory per week.