

CHEMISTRY & PHYSICAL SCIENCES



The Chemistry and Physical Sciences Department in New York City is located in the recently renovated and fully equipped Goldstein Laboratories, where the Biology department is also housed. This proximity allows for a constant exchange of ideas and approaches among all the faculty and students, often bridging the traditional barriers of the disciplines.

The curricula of our majors (Chemistry, Biochemistry and Forensic Sciences) carry the approval and certification of the American Chemical Society and they are continuously adjusted to the current trends in Chemistry and Physical Sciences. Our department has been a pioneer in embedding computational methods in the traditional chemistry curriculum and has built a state-of-the-art computational facility in addition to our complete and updated laboratory facilities. Recently, we started developing a strong Data Science interface with traditional Chemistry. Our program is also linked with the award-winning Haskins Laboratory, conducting joint research projects involving students, faculty and laboratory staff.

Upon graduation, our students possess critical and analytical thinking skills, a creative mindset, scientific and instrumentation competency, and the specialized abilities required to perform proficiently and confidently in today's world of science.

BS IN CHEMISTRY

The study of chemistry is both challenging and rewarding. It is a central science offering a wide range of career options. By prudent selection of elective courses, in consultation with faculty advisors, chemistry majors may choose a specialization in pre-medical, pre-dental or pre-veterinary studies. They may also elect to specialize in such areas as analytical, experimental, environmental, forensics, theoretical, industrial chemistry or management science.

BS IN BIOCHEMISTRY

The degree in biochemistry requires the same core studies as the chemistry program, including fundamental chemistry, biology, physics and math courses, as well as courses in biology and upper-division work in biochemistry, advanced biochemistry and advanced biochemistry laboratory work. Students will pursue research with department faculty members. Biochemistry majors often have a desire to continue their study to obtain a PhD, MD or a DDS degree.

\$82,520

Average annual earnings of people in the Chemistry and Physical Sciences field.*

*Source: Bureau of Labor Statistics

SUCCESS STARTS HERE

Samantha Pace '17, was the recipient of the Pace University Undergraduate Research Initiative for Summer 2014; Best Poster, William Patterson University 9th Annual Undergraduate Research Symposium in Analytical Chemistry (2015); and Eastern Colleges Science Conference Award for Excellence for a manuscript on the sol-gel process mechanism and for Best Poster (2014).

Eric Nguyen '16, was the recipient of the Eastern Colleges Science Conference Award for Excellence for a manuscript on the effect of nanomaterials on catalase enzymes (2014); Pace University Undergraduate Research Initiative for school year 2014-2015; and winner of the Pace University Research Showcase (2015).

Maximillian Baria '15, was the recipient of a Research Experience for Undergraduate (REU) grant to do summer research at the University of Michigan (2014); Best Poster, William Patterson University 9th Annual Undergraduate Research Symposium in Biochemistry (2015); and Pace University Undergraduate Research Initiative for school year 2014-2015. Baria went on to pursue a PhD in Chemistry at the University of Michigan.



CLASSROOM EXPERIENCE

You will be carried far beyond textbook learning to get hands-on experience with modern laboratory instrumentation. Current research projects include biochemical studies of parasitic diseases with a view to developing new antimicrobial agents to combat disease by opportunistic infections of AIDS patients, sexually transmitted diseases and East African sleeping sickness. Our students present their research at national and international conferences and publish their work in leading peer-refereed journals in the area of their work.

FACULTY AND FACILITIES

Our faculty members are actively engaged in a broad variety of research projects which often involve their students. Research topics including the following:

- **Demos Athanopoulos**, Ab initio calculations of molecular systems and their spectroscopic properties using Gaussian09. Application of various computer programs including PythonPrescription, AutoDockVina, and MGLTools to predict 3D protein structure of enzyme active sites and substrate binding energies;
- **Cho Chan**, Role of parasite adhesin amyloids in adhesion and infection;
- **Eric Chang**, Production and characterization of enzymes for medical and industrial applications;
- **Zhaohua Dai**, Fluorogenic compounds for use as biomarkers and mercury sensors;
- **Nanjie Deng**, Using computer simulation and molecular modeling to aid the discovery of new antiviral and anticancer drugs;
- **Erik Lascaris**, Computer simulations of the molecular dynamics in a variety of biochemical systems, ranging from bulk water to membranes and proteins;
- **Elmer-Rico Mojica**, Utilization of nanoparticles in removal of heavy metals in aqueous samples and land pollutants;
- **JaimeLee Rizzo**, Synthesis of naturally derived compounds to act as antibacterial agents and the modification of fabrics that kill bacteria and fungi on contact;
- **Rita Upmavis**, Investigation of factors that lead to increased oxidative and nitrative stress under conditions of inflammation and in disease states;
- **Nigel Yarlett**, Development of antimicrobial agents for the treatment of neglected tropical disease.



CAREER PREPARATION

Chemists impact almost every aspect of modern life, from developing better materials for automobiles to designing new drugs to cure life-threatening diseases. Chemistry provides a strong background for careers in research, medicine, law, pharmacy, environmental sciences, engineering, business technical writing and education. It also provides a foundation for graduate work in chemistry, biochemistry, pharmacology, green chemistry, and nanochemistry, and for admission to professional schools of medicine, dentistry, pharmacy and chemical engineering.

COMBINED DEGREE PROGRAMS

Pace University, in conjunction with Rensselaer Polytechnic Institute (RPI) and Manhattan College, offers combined programs in chemistry and engineering. These are 3+2 programs in which the student takes three years of instruction at Pace University and two years of instruction at RPI or Manhattan College. The chemistry bachelor's degree is awarded by Pace University. An additional bachelor's degree in chemical engineering is awarded by Manhattan College, and additional bachelor's degrees are awarded by RPI in chemical engineering, biochemical engineering, environmental engineering, industrial and management engineering, or material engineering. These unique programs combine a solid education in the basic sciences with a highly pragmatic understanding of the application of science to industry and business. They are programs suited to the Westchester area, a region with a large technical work force and an ongoing need for trained professionals.