



## GRADUATE STUDIES

# Chemistry



### JOIN OUR COMMUNITY OF SCHOLARSHIP AND RESEARCH

Join the Department of Chemistry at Villanova University for research training and advanced coursework in a broad range of specialties. The master's program in Chemistry can help you advance your career in the chemical, pharmaceutical or biotech industries, facilitate entry into a doctoral program, or matriculate into veterinary, dental or medical school.

#### MASTER OF SCIENCE IN CHEMISTRY: THESIS OR NON-THESIS TRACK

The master's degree program at Villanova offers both a thesis and a non-thesis track for students based on their individual goals. Students in the full-time program pursue a degree with the thesis option and work under the direction of a faculty mentor. Part-time students may pursue the non-thesis option.

- The thesis track option requires successful completion of 30 credits, including two core courses, four electives, three research courses and a thesis preparation course. In addition, full-time students serve as teaching assistants and receive a stipend and tuition remission.
- The non-thesis option requires three core courses and seven electives.
- Students in both tracks may take special topics courses.

#### STATE-OF-THE-ART FACILITIES

The Department of Chemistry is located in the Mendel Science Center, where research is conducted in state-of-the-art laboratories stocked with all required safety features and equipment. Recent large acquisitions include 500 MHz and 400 MHz JEOL NMRs, as well as SCIEX 5600+ TripleTOF and 4500 QTrap LC-MS/MS instruments, purchased with funding from the National Science Foundation. The Department is equipped with a full complement of modern analytical instrumentation, including an X-ray diffractometer and multiple GC/MS, GC, LC, FTIR, UV-Vis and fluorescence spectrometers. The Department has a full suite of biochemical instrumentation, including a Typhoon FLA 9500 laser imager, FPLC, high speed centrifuges, laminar flow hoods for cell culture work, and shaking incubators for bacterial or yeast cell growth.

#### EXPLORE OUR CURRICULUM

We offer a broad range of courses for you to explore. Courses are taught in the evening to accommodate part-time students with full-time jobs. Courses include topics in organic chemistry, inorganic chemistry, physical chemistry, environmental chemistry, analytical chemistry, biochemistry, solid state and materials chemistry, polymer chemistry, crystallography, metabolism, computational chemistry, chemistry in industry, and a variety of special topics and research courses. You will find a complete list of courses and course descriptions at [gradchem.villanova.edu](http://gradchem.villanova.edu).



## STUDY WITH OUR DISTINGUISHED FACULTY

Temer S. Ahmadi, PhD

*Associate Professor*

Materials/Physical Chemistry: Synthesis, optical and thermal properties of metal and metal oxide nanomaterials

Joseph W. Bausch, PhD

*Assistant Professor*

Organic and Computational Chemistry: Synthetic and computational studies of electron-deficient clusters, carborane synthesis, structure prediction

Eduard G. Casillas, PhD

*Associate Professor*

Organic Chemistry: Natural product synthesis, synthesis of antagonists for plant/fungal secondary metabolic pathways, terpene biomimetic synthesis

Aimee L. Egger, PhD

*Associate Professor*

Biochemistry: Oxidative and electrophilic stress, mechanisms of cytoprotective enzyme induction by plant-derived chemicals, synergy, human cell lines

Bryan C. Eigenbrodt, PhD

*Associate Professor*

Analytical/Materials Chemistry: Synthesis and electrochemical characterization of fuel cell catalysts; exploring the chemistry of algal biofuel generation

Amanda M. Grannas, PhD

*Professor*

Analytical/Environmental Chemistry: Photochemistry, pollutant fate, snow/ice chemistry, ice core analysis, dissolved organic matter chemistry, climate change

Ryan P. Jorn, PhD

*Associate Professor*

Physical/Theoretical Chemistry: Multi-scale modeling of charge transport in electrochemical systems and materials for rechargeable battery technology

W. Scott Kassel, PhD

*Professor*

Inorganic Chemistry: Solid-base catalysis, X-ray diffraction, synthesis of chiral pyrrolidine transition metal complexes as enantioselective catalysts

Daniel A. Kraut, PhD

*Associate Professor and Chair*

Biochemistry: Mechanism and kinetics of unfolding, degradation and partial degradation of proteins by the proteasome

Anthony F. Lagalante, PhD

*Professor*

Analytical Chemistry: Mass spec instrumentation and methodology with applications in agricultural insecticides, environmental toxins, art conservation

Kevin P. C. Minbiole, PhD

*Professor*

Organic Chemistry: Natural products chemistry, medicinal chemistry, organic synthesis, identification of amphibian defense compounds

Brian K. Ohta, PhD

*Associate Professor*

Organic Chemistry: NMR spectroscopy, intermediate characterization in photosensitized oxidation reactions, hydrogen bond asymmetry

Matthew C. O'Reilly, PhD

*Assistant Professor*

Organic Chemistry: Synthetic of organic compounds, natural products, medicinal chemistry, chemical biology

Jennifer B. Palenchar, PhD

*Associate Professor*

Biochemistry: Characterization of trypanosome transcription complexes, mechanistic enzymology of trypanosome metabolic enzymes

Jared J. Paul, PhD

*Professor*

Inorganic Chemistry: Proton coupled electron transfer, synthesis of transition metal catalysts for solar energy conversion, photochemistry, electrochemistry

Barry S. Selinsky, PhD

*Professor*

Biochemistry: Membrane biophysics, structural analysis of membrane proteins, membrane-active antibiotics

Deanna L. Zubris, PhD

*Professor*

Organometallics/Polymer Chemistry: Development of metal-ligand complexes as catalysts for polymerization, homogeneous catalysis

FOR MORE INFORMATION OR TO APPLY:

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