



Faculty

William Bare, Associate Professor of Chemistry; B.S., Chemistry, Florida State University; Ph.D., University of Virginia

I began teaching at Randolph College thinking that I would only be here a year. But when the opportunity arose to make the temporary position permanent, it wasn't hard to make a decision. Randolph is a completely different world than I was accustomed to from my educational background at large state universities, and I really liked the personal feel of the college. The red brick campus began to feel like home almost immediately.

Environmental chemistry is my favorite course to teach because it brings together all of the material learned in introductory courses and places it in the context of important national and global issues. Smog, ozone depletion, greenhouse gas emissions, global warming, alternative fuels, and ground water contamination are all issues of tremendous current importance, and are also all issues that cannot be understood without understanding the chemistry of the species and processes involved. Although many of these issues represent great concerns, they also provide great opportunities for future creative chemists to make meaningful improvements to people's lives.

Williams, M. J.; Bare, W. D. Synthesis and Spectral Analysis of the Bologna Stone, a Historically Important Inorganic Phosphor. *Proceedings of the 70th SERMACS Conference*, Augusta Georgia, Oct 30 – Nov 3, 2018. (student presentation)
Bare, W. D. Safe Production of Continuous Colored Flame Tests for Lecture Demonstrations and Student Laboratories. *The Chemical Educator*, in press.

Ann Fabirkiewicz, Charles A. Dana Professor of Chemistry, Natural Sciences and Mathematics Division Head, Chair of the Chemistry Department; B.S., University of Michigan; Ph.D., University of Tennessee

I knew I wanted to be an organic chemist in high school and that I wanted to teach it at the college level by my sophomore year, so I'm pretty sure I've found my dream job! I also get to teach Biochemistry, a course in nutrition and Topics in Organic Chemistry. I advise students interested in the health professions and enjoy helping students both sort out their interests in the many fields available and work through the admissions prerequisites and required paperwork.

My current research interests involve the study of techniques to quantify antioxidants in foods and beverages as well as developing TLC staining methods for antioxidant fingerprinting. My students and I have analyzed chocolate, fresh and bottled juices, herbal teas, and colored rices most recently.

Fabirkiewicz, A. M.; Stowell, J.C. *Intermediate Organic Chemistry*, third edition, Wiley, 2015.
Antioxidant Analysis of Herbal Teas Using Thin-Layer Chromatography (student research project)

Jesse Kern, Assistant Professor of Chemistry; B.S. Baker University; Ph.D., University of Kansas

Physical chemistry has been a passion of mine ever since my first undergraduate thermodynamics course. Physical chemistry gracefully connects the fundamental physical descriptions of matter with the everyday properties of matter that we know and love. I teach courses in quantum mechanics, thermodynamics, materials science, as well as introductory general chemistry. I also advise chemistry majors interested in pursuing graduate school.

My current research interests are related to phenomena that occur at surfaces. We primarily use simulation techniques such as molecular dynamics and Density Functional Theory to understand surface structure and properties on the atomic scale.

Keller, C.L.; Kern, J.L.; Terry, B. D.; Roy, S.; Jenkins, D.M.. *Catalytic aziridination with alcoholic substrates via a chromium tetracarbene catalyst*, *Chem. Comm.*, **54**, 1429–1432 (2018).
Multiscale Modeling of Functionalized Surface Catalysts for Hydrogen Peroxide Production (student research project)

Randolph's Academic Offerings

- Bachelor of Science Degree in Chemistry
- Bachelor of Arts Degree in Chemistry
- Minor in Chemistry

Through lectures, laboratory work, research, and seminars, students in Randolph College's chemistry department achieve a basic knowledge and conceptual understanding of matter, its structure and properties, and the nature, energetics, and dynamics of its transformations.

The department maintains small lecture and laboratory sections to ensure students have extensive access to faculty and the College's facilities and instruments.

Majors have the opportunity to serve as lab assistants and tutors, and the faculty encourages placement of students into summer research programs in addition to an active summer research program on campus.

All seniors complete a research project under the mentorship of a faculty member. Research opportunities are available earlier in the curriculum as well.

Opportunities for Experience

Summer Research

Spend the summer working closely with a professor and focused on a specific aspect of chemistry.

Randolph's intensive eight-week Summer Research Program enables students to conduct research that is complemented by a thorough review of the relevant literature; live in a residence hall on campus, participate in on-campus summer events, attend special seminars with guest speakers; and share the progress and results of their research.

Internships

Chemistry majors have completed special programs in forensic science with the Charlottesville Police Department, pharmacy at Lynchburg General Hospital; sanitation in the Hampton Roads Sanitation District, analytical chemistry at Fleet labs and Abbott labs, scribing at the Lynchburg Free Clinic, working with the Department of Environmental Quality, and working in the College's Natural History Collection.

What Will a Chemistry Degree Do for Me?

Chemical Engineers

Bachelor's degree \$102,160

Chemical engineers apply the principles of chemistry, biology, physics, and math to solve problems in the production or use of chemicals, fuel, drugs, food, and many other products. They design processes for large-scale manufacturing, plan and test production methods and byproducts treatment, and direct facility operations.

Environmental Scientists and Specialists

Bachelor's degree \$69,400

Environmental scientists and specialists use their knowledge of the natural sciences to protect the environment and human health. They may clean up polluted areas, advise policymakers, or work with industry to reduce waste.

Forensic Science Technicians

Bachelor's degree \$57,850

Forensic science technicians aid criminal investigations by collecting and analyzing evidence. Many technicians specialize in various types of laboratory analysis.

Chemists

Bachelor's degree \$76,280

Chemists analyze materials to develop new and improved products and pharmaceuticals and to confirm the quality and safety of manufactured goods.

Materials Engineers

Bachelor's degree \$94,610

Materials engineers develop, process, and test materials used to create a wide range of products, from computer chip to golf clubs to biomedical devices. They study the properties and structures of metals, ceramics, plastics, nanomaterials, and other substances in order to create new materials.

According to the Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook* <https://.bls.gov/ooh> May, 2017