

# Chemistry

## MAJOR MAP

### How to use the map

This map is designed to give you information about your chosen major that will help keep you on track for graduation within 4 years. The introductory sections will help orient you to the “big picture” ideas like the topics and areas of interest inside your major, the kinds of courses you will take, university policies including admissions, and other general topics. The chart on the second page will help you to develop a productive plan to make the most of your 4 years at East Carolina University and prepare yourself for the job market after graduation.

Remember, it is important that you diversify your experiences, both for success in your degree program and for success outside of school. While coursework is important, it should not be your only focus. The chart below will show you how to incorporate other kinds of experiences that will expand your knowledge of your chosen field and make you a more desirable job candidate. The map is only a guideline. Remember to speak with your advisor often to learn about new opportunities, clarify concerns, and develop a plan that is right for you.



### Questions?

East Carolina University offers an array of support to help you grow and learn from your first day of orientation until your graduation. New Student Orientation, Pirate to Pirate Mentoring, the University Writing Center, and the Career Center are only a few of the services and centers available to assist you throughout your time on campus.

THOMAS HARRIOT COLLEGE OF ARTS AND SCIENCES

# Chemistry



## ABOUT THE MAJOR

Chemistry is the central science. Its impact can be easily seen across our world through all human experiences. Everything you hear, see, smell, taste and touch involves chemistry and chemicals. A degree in chemistry maximizes the opportunity to explore and change your world. The guiding principles of chemistry are the basis for much of Pharmaceutical Science, Environmental Science, Forensics, Biochemistry, and beyond. Chemists are leaders, collaborators, inventors, and game changers, and our professors are experts in their field who will mentor you in a caring, encouraging environment!

There are five main areas of Chemistry:

- Analytical Chemistry focuses on the measurement of the amount and composition of materials. Most analytical chemists develop and use instrumental tools for their chemical analyses.
- Biological Chemistry can be thought of as the study of the chemistry of life. This discipline applies the concepts and tools

of chemistry to the investigation of the structure and properties of molecules found in living organisms.

- Inorganic Chemistry involves the study of non-hydrocarbon molecules. A quick glance at the periodic table reveals that this encompasses a wide variety of species. Despite the inorganic label, inorganic chemistry can involve the study of organic molecule transformations at metal centers – processes that are at the heart of enzyme reactions and catalysis.
- Organic Chemistry involves the study of carbon-based molecules. Organic chemists are interested in making novel and interesting compounds, as well as understanding the structures and functions of these molecules.
- Physical chemistry focuses on the study of chemical systems and processes. Physical chemists incorporate the principles of thermodynamics, kinetics, and quantum theory into their experimental approaches.

## DEGREE OPTIONS

You may choose to pursue a Bachelor of Science (BS) or Bachelor of Arts (BA) degree in Chemistry, or a BS degree in Biochemistry with a Chemistry concentration. The BS degree in Chemistry offers in-depth coverage of all major areas of chemistry, and is certified by the American Chemical Society. The BA degree in chemistry

provides excellent grounding in chemistry principles, including specially focused 3000-level coursework. The Chemistry concentration in the BS Biochemistry degree is rooted in structural biochemistry and emphasizes the dynamics of biochemically important systems



## ADMISSIONS INFO

You can apply to the Thomas Harriot College of Arts and Sciences through the Office of Undergraduate Admissions website at [www.ecu.edu/admissions](http://www.ecu.edu/admissions). To be considered for admission, freshmen applicants will submit their high school transcript and standardized test scores. Transfer applicants will submit official transcripts from all previously attended institutions. Application deadlines and specific admissions requirements for freshmen and transfer applicants are listed on the website.

## COURSE HIGHLIGHTS

From the very beginning of the Chemistry curriculum, students are developing and defending their own ideas, helping them build critical thinking skills. Advanced courses like Chemistry 3451: Elementary Inorganic Chemistry Laboratory, which involves the synthesis and characterization of inorganic and organometallic compounds, allow students to use modern, high tech equipment to do their experiments. Our department offers specialized coursework to introduce senior students to pharmaceutical industry skills; the course covers regulations, laws, and skills involved in good laboratory (GLP) and current good manufacturing practices (cGMP). Research for a professor also counts as a course in students' schedules!

## WORKING WITH FACULTY MEMBERS

Faculty members in the Department of Chemistry are here at ECU because they believe in fostering the growth and development of young scientists. Our faculty members are passionate about this investment and their dedication shows. Students provide the workforce in faculty members' research laboratories and even assist meaningfully in teaching and learning with their peers.

## WORKPLACE SUCCESS

### What employers want

As a Chemistry major, you will be ready to pursue a career that requires specific skills and experiences. These often include:

1. Maintaining accurate and reliable documentation and recognizing the importance of data integrity.
2. Designing useful and technically sound experiments.
3. Interpreting and communicating data, and relating it to associated literature and practice.
4. Adhering to health and safety requirements set forth by governing bodies like the FDA or EPA.
5. Carrying out projects with teams in a variety of disciplines, roles, and locations.

As a college student, you are now expected to take ownership of your skill development. Take the time to think about the unique skills and experiences you have or would like to gain at ECU. Seek out opportunities to expand your learning outside the classroom and challenge yourself to grow both as a student and as an emerging professional.

## WHAT CAN I LEARN?

Pursuing a major in the Department of Chemistry at ECU will challenge you to solve problems related to technology, medicine, food and drug safety, the environment, and beyond. Our coursework builds on general and organic chemistry to prepare you to answer a variety of questions in your career, such as:

- What part of this medicine is effective? How is it metabolized in the body?
- How will the ecosystem repair itself after exposure to this chemical?
- Are there traces of this illicit compound present in this sample?
- Can we design a molecule to transport this drug to treat this disease?

Our department provides hands-on experience with methods and techniques used in industry, healthcare, forensics, and many other fields. Advanced laboratory and undergraduate research experiences help you problem-solve and think outside the box. All degrees offered in the Department of Chemistry provide strong math and science foundations and are excellent preparation for employment, professional (medical, dental, pharmacy) school, or graduate school in the sciences.



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## FIRST YEAR >>>

## SECOND YEAR >>>

## THIRD YEAR >>>

## FOURTH YEAR >>>

## POST-GRAD OPTIONS

### THE COURSES YOU NEED

The most important courses for you to take are Math and Chemistry. Register for the hardest Math course in your required Math sequence that you can place into. Take CHEM 1150/1151 in the fall, and 1160/1161 in the spring. Be sure to take ENGL 1100 during your first year. Fill out your schedule with General Education requirements.

Math and Chemistry continue to be critical courses in your schedule. ENGL 2201 is also very important to take this year. Sign up for CHEM 2750/2753 and 2760/2763. For the BS degree, continue to take the appropriate Calculus courses (2171, 2172) so that you can take PHYS 2350/1251 this year. For the BA degree, take foreign language courses.

BS students need to complete Calculus (2173) and Physics (2360/1261) during the fall, and take CHEM 2103 and 2250/2251. BS students should also register for CHEM 3950/3951 and CHEM 3450/3451 in the spring. BA students should take at least one 3000-level chemistry course and lab this year, and complete their foreign language courses.

In the fall, BS majors will enroll in CHEM 3960/3961, then 4350/4351 in the spring. They will also complete CHEM 2770 and other restricted electives. BA students have some flexibility depending on what was completed junior year. Ensure that you have enough credits to graduate.

A Chemistry degree from ECU can prepare you for a variety of career options. You can advance your education by attending one of these graduate or professional schools:

- Chemistry (MS, PSM, PhD)
- Biomedical Sciences (MS, PhD)
- Pharmacology (MS, PhD)
- Toxicology (MS, PhD)
- Forensic Science (MS, PhD)
- Medical School (MD or DO)
- Dental School (DDS or DMD)
- Pharmacy School (PharmD)
- Physician Assistant School (MS)
- Veterinary School (DVM)
- Optometry School (OD)

### GAIN RELEVANT EXPERIENCE

Explore your major and career options in consultation with your advisor. Learn more about the types of extracurricular activities and other research opportunities available on campus so you can begin to identify potential employment and graduate or professional schools.

Meet with [Career Services](#) often to work on your post-graduation plans. Investigate job-related skills and identify gaps in your résumé so you can address them early. Use the [Occupational Outlook Handbook](#), [USAJobs.gov](#), and/or other resources available through [Career Services](#) to identify common skills in your career field.

Undergraduate research, internships, part-time jobs, student leadership positions, and volunteer or community engagement activities can help build your résumé and give you valuable experience. Connect directly with faculty members who share your interests and attend career fairs to explore your interests, network, and identify opportunities.

Volunteering for political, governmental, or social organizations is a great way to get experience in your field, build your résumé, test your interest in working with diverse populations, and develop your professional network.

Chemists are sought after employees in a variety of fields and jobs including:

- Research and Discovery
- Pharmaceutical Manufacturing
- Forensic Science
- K-12 Education
- Food Safety
- Environmental Science
- Quality Control and Assurance

### COMMUNITY CONNECTION

Emails from the department will let you know about upcoming guest lectures, internship opportunities, and special events. Follow the department social calendar to attend events such as bi-monthly sponsored seminars from speakers in government, private industries, and other university laboratories.

Join student organizations that suit your interests, which may include [Chemistry Club](#), Pre-Pharmacy Club, or the [Sigma Xi Scientific Research Society](#). For a full list of student organizations, visit [OrgSync](#).

Connect with the [Center for Leadership and Civic Engagement](#) to explore local opportunities. Also consider contacting community partners using the [Orgsync](#) directory. To build your professional network, join a professional organization like the [American Chemical Society](#).

Submit a proposal to present a polished research paper from one of your CHEM classes at [regional](#) or [national](#) meetings of the [American Chemical Society](#). Also consider presenting at ECU's RCAW or [SNCURS](#), or another state or regional conference that is open to undergraduates.

### THINK GLOBALLY

Being internationally aware and culturally competent is increasingly important. Think about ways you could build these skills, which may include foreign language or Global Understanding courses, study abroad, or internationally-focused courses or student organizations.

Integrate internationally-oriented classes into your electives and consider a minor or second major in an international field or foreign language. Spanish and German are particularly helpful to Chemistry scholars. Consider a summer or semester-long study abroad program. Apply for study abroad scholarships in the early fall.

Make the most of your return from your study abroad or internship program by becoming more active in your student organizations. Work with the [Office of Global Affairs](#) and the [Career Center](#) to learn how to leverage your study abroad experience to improve your job placement possibilities.

Take on a leadership position in one of your globally-oriented student organizations. Complete your program by incorporating more internationally-focused courses.

### VISIT US ONLINE

For more information and an interactive map PDF, visit: [www.ecu.edu/chem](http://www.ecu.edu/chem)

### CAREER PREPAREDNESS

Visit [Career Services](#) to learn about their resources. Check out the [Bureau of Labor Statistics](#) and [Virtual Job Shadow](#) to explore potential careers. Log in to [Handshake](#) to set up your profile, check out career events, and begin to explore potential employers and job opportunities.

Meet with your Career Counselor to explore your goals and develop your résumé. Attend career fairs and other employer-related activities. Speak to your instructors and advisors about career options often.

Develop your [LinkedIn](#) profile. Meet with your Career Counselor to discuss postgraduation plans. If needed, research graduate schools and program requirements. Continue to attend career fairs and other employer-related career events.

Meet with your Career Counselor to put your post-graduation plans into action. Refine your résumé, [LinkedIn](#) profile, and interview skills. Complete the Pirate Employment Survey.



APPLY FOR SCHOLARSHIPS EVERY YEAR

CONSIDER UNDERGRADUATE RESEARCH OR AN INTERNSHIP