

Natural Sciences at Maryville College

Possible Majors:

Biology
Biology for Teacher Licensure
Chemistry
Chemistry for Teacher Licensure
Biochemistry
Chemical Physics

Possible Minors:

Chemistry | Biology | Physics

Class Favorites:

Vertebrate Field Biology (BIO 403) —

Taught as either Ornithology (Dr. Crain) or Herpetology (Dr. Cash) in alternating years, Vertebrate Field Biology is the hands-on course that, in Sally Johnson's '04 words, "got us out of the classroom and into the natural environment around us. This is the class that made me know I was at the right school."

Forensic Science (Science 350) —

Designed as a senior course for majors outside the sciences, it has led to three students from the Natural Sciences division pursuing graduate degrees in Forensic Science. Taught by Dr. Bunde, "You hear about forensic science on television, in movies, and in books all the time. You study it at Maryville."

Science and Religion Senior Seminar

(SRS 480) — One of the most popular of the new senior seminar courses which are designed to study big questions from two different disciplinary perspectives. Taught by Dr. Drew Crain, "because science and religion are too often pit against one another. It's how they're intertwined that's truly interesting."



What interests you?

Whether your interest lies with the understanding of the function of a molecule or gene or you are curious about the function of complex ecological communities, the program and faculty expertise in the Division of Natural Sciences at Maryville College is structured to give you the tools you need for success in whatever career you choose.

The program in the sciences here at Maryville College is also designed to give the student intellectual training *and* hands-on experience in modern science topics. Too often, students lose sight of the fact that science is a creative process. We encourage students not to just think or talk about science, but to actually go out and do it.

Courses, internships, seminars and the senior study program are all designed to put more than knowledge about science, but science itself, in the hands of our students. Through these programs, our students understand the value of exploration and problem solving as being skills that extend well beyond the laboratory. As faculty, our purpose is to help you think about the questions that fascinate you, and then to equip you with the knowledge and resources to find the answers.



Quick Fact

- ◀ DR. BEN CASH, MC Biology, is the lead researcher for the reptile survey in the Great Smoky Mountains National Park as part of the **All Taxa Biodiversity Inventory (ATBI)**. Dr. Cash has had several MC students working with him in the past, four of whom are current graduate students in ecology/zoology programs. Current additional projects include a study on salamander distribution in the Cherokee National Forest and long-term research involving anuran species in the east Tennessee region and in the sub-arctic of Canada. All of these projects involve students.



Faculty Profile

Name: Drew Crain

Title: Associate Professor of Biology

Courses Taught: Animal Physiology, Developmental Biology, Environmental Toxicology, Perspectives on the Environment,

Ornithology, Science and Religion

Education: B.S. (Biology), Clemson University; M.S. (Zoology), University of Florida; Ph.D. (Zoology), University of Florida

At Maryville College since: 1998

More often than not, Dr. Drew Crain finds that scientists are stereotyped as withdrawn, boring people. This is a perception that Crain is working to change. As lively and engaging in class as he is in person, the biologist with an affinity for things that crawl, creep or slither (namely, reptiles and amphibians) is a favorite among Maryville College students, faculty and staff.

As a teacher, Crain understands his greatest challenge to be helping students make practical connections between what classroom learning and the larger world. Not surprisingly, labs for Crain's classes are never optional. "For me, lab is not 'in addition' to the lecture," says Crain. "It is part of the lecture." And by insisting that his students actually "do science," rather than simply learn about it, Crain's classes have become some of the most popular on campus.

In his continuing quest to put aside incorrect stereotypes, Crain stresses both written and oral communications skills in his classes. "Being a good scientist requires one to be a good communicator." Hence, the writing and speech courses in Maryville's core curriculum are, in Crain's estimation, just another necessary prerequisite for a solid foundation in the sciences.

Drew Crain teaches more than just biology – he has a talent for teaching his students to see the larger, interconnected perspective, the "whole forest, not just the individual trees." Whether he is teaching about birds, pressing environmental issues, or the hard-to-answer questions that science and religion both raise, Crain helps keep the "everyday importance" of his lessons in view.

"I want every student to come out of class saying, 'Wow, I've really learned something useful.'"

Quick Fact

Maryville College is an undergraduate member of Oak Ridge Associated Universities (ORAU) and participates in the functions of this consortium which gives our students access to summer research opportunities. Dr. Bunde serves as the Maryville College representative to **ORAU**.

Natural Science Faculty & Staff:

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Dr. Ben Cash Division Chair of Natural Sciences, Associate Professor of Biology
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Dr. Mary Turner Assistant Professor of Chemistry
Education: Bachelors: Chemistry and Physics; 1997; Harding University, Doctorate: Chemistry; 2003; Rice University | mary.turner@maryvillecollege.edu

Dr. Maribeth Vowell Adjunct Instructor, Biology | maribeth.vowell@maryvillecollege.edu

Student Research/Achievements:

Joshua Ennen (2003 - Biology) researched "Circadian calling dynamics of the wood frog, *Rana sylvatica*, in Great Smoky Mountains National Park," resulting in a Senior Study on the topic. Currently pursuing a Ph.D. in Biology at the University of Southern Mississippi.

Catherine Webb, (2003 - Biology) developed an interest in the control of growth and development of vertebrates through coursework in Developmental Biology and Animal Physiology. From this, she designed and conducted a study on "The Effects of Malathion on Growth and Development of *Xenopus* leaves." Currently pursuing an M.S. at Virginia Polytechnic Institute and State University.



Rachel Bowman (2002 - Chemistry) conducted research with Dr. Kristi Kneas, culminating in a presentation at the national ACS meeting in 2002 and a publication in *Journal of Microscopy*.

Valerie Malyvanh (2001- Chemistry) did Senior Study research on transferring an ion transport protein, which was presented at the Council of Undergraduate Research Meeting of Posters on

Capitol Hill, Spring 2001. She also completed a summer undergraduate research project, resulting in a paper in *Biosensors and Bioelectronics*.

Elizabeth Hewitt (2001 - Biology) conducted research with Dr. Louis Guillette at the University of Florida on physiological changes in alligators induced by environmental toxins. The results of this research were published in *Chemosphere*.

Student Organizations & Groups:

Beta Beta Beta National Biology Honor Society

Student American Chemical Society Chapter

Both of these organizations are very active, bringing outside speakers to the campus, and engaging in outreach to local schools and the community. The student ACS chapter has been voted with honorable mention (2000-2001 and 2002-2003) and commendable chapter status (2001-2002) by the National ACS organization over the past three years.

Experiential Learning Opportunities:

Internships and practica with local industries (TVA); with local physicians and regional hospitals; in local bio-molecular, analytical, environmental laboratories.

Formal Summer Research Programs at National laboratories (ORNL, Savannah River, Argonne, Livermore, Batelle, Brookhaven) or at NSF-funded summer research (REU) programs (UTK, UK).

A summer undergraduate research program on characterizing G protein coupled receptors (GPCR) in yeast run from the natural science division at Maryville College. This research is funded by both the NIH and the ACA.

Ongoing faculty-sponsored research projects in the east Tennessee region and in northern Manitoba, Canada offer students the chance for one-on-one experience.



Student Profile

Name: Ben Taylor

Hometown: Maryville, TN

Major: Biology; **Minor:** Chemistry

Dr. Cash, my advisor, always has his door open, and I can go in and shoot the breeze with him. It's a comfortable atmosphere for students. Having this kind of relationship makes working on my Senior Study even more exciting.

"My study, 'Basic Habitat Analysis of the Tellico Salamander, *plethodontid aureolus*' builds on the discovery of a new species of salamander endemic to the Cherokee National Forest. Very little is known about it, and because of its low population numbers, it's at high risk for extinction. The goal of my study is to describe its habitat needs so that the Cherokee National Forest can make sure those requirements are met. Next semester, I'll be taking quite a few trips there. In fact, I'll be in the National Forest most weekends!"



Ben Taylor found himself deep in the rain-forest of Ecuador during a summer research trip to study poison dart frogs. Are those poison dart frogs on his glasses? You bet.

Recent Graduate/ Career Data

NAME | MC DEGREE | FIELD | INSTITUTION

Bean, Benjamin

Biology | Biology | TVA

Caughron, Justin

Chemistry | Medical School | UTMHSC

Davenport, Jon

Biology | PhD Biology |
East Carolina University

Ennen, Joshua

Biology | PhD Biology |
University of Southern Mississippi

Flenniken, Carli

Chemistry | Research Technician | UTK

Johnson, Amanda

Biochemistry | Pharmacy Doctorate |
Campbell University

Kincaid, Brian

Biology | Medical School | Duke University

Kirby, Kenneth, Jr.

Biology & PHR | Doctor of Physical
Therapy | Duke University

Kissinger, Chelsea

Biochemistry | Nurse Practitioner | UTK

LeBar, Jennifer

Biology | MBA | Queens University

Lehman, Chris

Biology | Vet School | UTK

Lovingood, Ginger

Biology | Medical School |
East Tennessee State University

Mackens, Austin

Biology | Medical School | UTMHSC

Mabe, Adam

Chemistry | Medical School | UTMHSC

McCallum, T.J.

Biology | Resident Lab Technician |
Vanderbilt University

Nichting, Patty

Chemistry | Chemistry | UTK

Robison, Benjamin

Chemistry | Engineering | UTK

Schmutzer, Chandler

Biology | MS Biology | UTK

Schumaker, Shelley

Biology | MSN/Certified
Nurse-Midwifery | Vanderbilt University

Webb, Catherine

Biology | MSBiology | Virginia Tech

Life After MC | Alumni Highlights

Name: MICHAEL CHERSKOV '80

Major: Chemistry

Current Title & Employer: Intellectual Property Attorney, Cherskov & Flaynik

Web site: www.cherskov.com

What have you recently achieved in your career or life that you're especially proud of:

I am proud of the continuing growth of our practice, Cherskov & Flaynik and of the good people we've been able to hire. We just won a major settlement award in a copyright litigation action for one of our clients. On a personal note, I'm working toward my IFR (instrument flight rating) certification for aviation. This will allow me to fly in any kind of weather to visit properties associated with my other business, and also to visit friends.



In what ways did your MC experience prepare you for your current vocation:

I use my chemistry everyday. I'm serious about that. My specialty is biotechnology and chemical patent application drafting and prosecution. My clients include hi-end organizations—Argonne National Laboratories, University of Chicago and the Department of Energy. These people deal with cutting edge stuff, protein engineering, enhanced aluminum production, ceramic technologies. My studies at MC provided me the grounding to begin to understand these technologies....Because of the bedrock in chemistry/biochemistry that Naylor/Bunde gave me, I was able to hit the ground running when I first started.

Favorite course at MC:

Spectroscopy. Naylor taught the NMR portion and Bunde taught the IR stuff. It dealt with both inorganic and organic analysis.

Thing you love most about what you do now:

It's a combination of things. I love science (I really am a nerd at heart). I enjoy writing about science. In fact, I went from MC to the masters program in science communication at Boston University to become a science news reporter. And I like the law. These three things—science, writing and law—I do every day. It's a perfect fit for me.

Building Community & Staying Sharp

Maryville College is a member of the **Appalachian College Association** and has full access to the various programs of the consortium. Division faculty regularly attend workshops on Instructional Technology and meet with science colleagues at other ACA schools.

A regional tournament for junior and senior high school **Science Olympiad** Teams is hosted periodically at Maryville College. Dr. Bunde also serves on the State of Tennessee Science Olympiad Board.

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