

# Biology

“One Course At A Time allows us to focus our attention on one thing. We not only learn that topic better, we retain it better.”

*Barbara Christie-Pope, a biology professor at Cornell College who specializes in neuroscience*

**B**iology students don't just study biology at Cornell College; they actually get to be biologists, exploring authentic research questions for which the answers are unknown. While striving to achieve a major or minor in this field of study, students will develop a range of technical and practical skills in the field and in the laboratory.

Students work with biology faculty who represent a wide range of specialties and interests, ranging from molecular genetics and neurobiology to ecology and conservation. More importantly, students do all of this in a supportive learning environment as they explore the breadth of the biological sciences and discover what kind of biologist they want to become. Biology courses are also a core component of two related majors: biochemistry and molecular biology, and environmental studies.

#### **BENEFITS OF ONE COURSE AT A TIME**

Learning biology under the One Course calendar means students will be practicing science in “real-time,” not just once a week as they would at a school using the semester calendar. Students have the time to design and perform ecological experiments during frequent field trips to local wetlands, prairies, or forests. Daily labs allow students to analyze the molecular genetics of cells, measure how cells respond to drug treatments, detect enzyme activities in animal tissues, or apply concepts of anatomy and physiology while examining human tissues in the cadaver lab.

The One Course calendar lets the department teach biology during extended off-campus trips. Examples of that include learning ecology at the Wilderness Field Station in northern Minnesota; conservation biology in Costa Rica, the Philippines, or Myanmar;

coral reef biology in Belize or the Bahamas; or plant-insect interactions in South American rain forests.

#### **CURRICULUM HIGHLIGHTS**

##### **CAPSTONE**

Students' academic experience will culminate in a senior biology capstone in which they develop their own study to investigate a biological problem. This can be a project the student designs, a contribution to an on-going research project, or even part of an off-campus course in the Caribbean. The project includes reviewing literature, collecting and interpreting data, writing a research report, and presenting the work to peers.

##### **RESEARCH**

###### **STUDENT-FACULTY RESEARCH**

Students have many different opportunities to collaborate with professors and other professional biologists. All of Cornell College's biology faculty are involved in long-term research projects and work collaboratively with students both during the school year and during the summer. Students can even share their work with the broader scientific community by presenting at Cornell's annual Student Symposium or publishing papers in scientific journals.

Our faculty mentor students as part of the Cornell Summer Research Institute. The Summer Research Institute allows participants to become part of a learning community, living on campus, participating in career-development workshops, and helping to decide if a career in scientific research is the right path. Biology faculty currently have active research projects in areas such as the bleaching factors affecting Caribbean fire coral, molecular genetics of a yeast that may be related to human obesity, potential relationships between skin pigmentation and neurodegenerative diseases of the brain, and conservation of threatened species such as ornate box turtles and monarch butterflies.

## *Faculty Bios & Courses*

### **JEFF CARDON**

*Professor of Biology and Chemistry*

Teaches courses in biology and chemistry, including Cell and Molecular Biology, Biochemistry, Microbiology, and Organic Chemistry. Recent research with students has focused on energy utilization in the yeast *S. cerevisiae*, which may shed light on biological causes of obesity in humans. Ph.D., University of California, Los Angeles; B.S., University of Utah.

### **BARBARA CHRISTIE-POPE**

*Professor of Biology*

Teaches courses in biology, including Neurobiology, Immunology, and Human Anatomy and Physiology. She has research interests in neuropharmacology and degenerative diseases of the brain, and recent studies with students and University of Iowa researchers are examining zebrafish for a potential link between pigment producing melanocytes in the skin and dopaminergic neurons in the brain. Ph.D., University of South Alabama; B.S., University of Oklahoma; B.S., University of South Alabama.

### **MARTY CONDON**

*Professor of Biology*

Teaches courses in biology, including Evolution, Plant Morphology, and Plant Systematics. She collaborates with researchers in various institutions and countries to study the evolution and ecology of plant-animal interactions. She also uses molecular biology and field biology to study species diversity in tropical rain forests and tallgrass prairies. Ph.D., University of Texas; B.S. University of Michigan.

### **ANDY MCCOLLUM**

*Professor of Biology*

Teaches courses in biology, including Animal Behavior, Entomology, and Ecology. His research with students focuses on the ecology and conservation of threatened and endangered species, including the ornate box turtle in Iowa and the leatherback sea turtle in Costa Rica. He also contributes to collaborative research projects on the phenotypic plasticity of tadpoles. Ph.D. in Zoology, Duke University; B.S., North Carolina State University.



#### OFF-CAMPUS RESEARCH

In addition to work done on campus and during courses, students have the opportunity to take part in research off-campus related to their interests at places like the Emory University Gynecology and Obstetrics Department, the University of Colorado Medical School, the University of Iowa Genetic Laboratory, and other state universities throughout the country.

#### DIMENSIONS PROGRAM FOR HEALTH PROFESSIONS

Dimensions is an academic enrichment program for Cornell students of any major who are interested in careers in health care. The program works closely with biology and other science departments to provide research opportunities and internships for students in health-related fields, including physicians offices, public health offices, and research laboratories.

Dimensions also supports a wide range of opportunities, including professional workshops and seminars, assistance with admission test preparation (MCAT, GRE, PCAT, DAT), and navigating graduate admission processes. If students decide to apply to a health care program, Dimensions staff will help set up the application materials through a Health Professions Committee that serves in an advisory capacity and is responsible for the preparation of a letter of recommendation to support Cornell student applications to professional school.

#### INTERNSHIPS/FELLOWSHIPS

The One Course calendar enables students to participate in monthlong internships working alongside professionals and getting a first-hand look at potential career paths, giving students the chance to take part in off-campus experiences tailored to specific interests and earn credit toward graduation. Cornell students have held internships at places such as the Mote Marine Lab and Big Cat Rescue in Sarasota, Florida; Turpentine Creek Wildlife Refuge in Eureka Springs, Arkansas; the Iowa State Hygienic Lab in Coralville, Iowa; Child Family Health International in New Dehli, India, and Oaxaca, Mexico; the Mayo Clinic in Rochester, Minnesota; Baylor College of Medicine in Houston, Texas; the Children's Hospital in Aurora, Colorado; and the University of Maryland School of Medicine in Baltimore, Maryland.

#### AFTER CORNELL

National Association of Colleges and Employers (NACE) reports that demand for biologists is projected to grow 5 percent from 2014 to 2024, with a typical starting salary of \$32,738. Career options include research, health fields,

biotechnology, forensic science, bioinformatics, and science and medical writing.

#### ALUMNI CAREERS

Volunteer coordinator, Crane Trust, Wood River, Nebraska (Class of 2015)

Shorebird beach warden, National Audubon Society, Charleston, South Carolina (Class of 2015)

Pathology technical and clerical aide, Southeast Health, Cape Girardeau, Missouri (Class of 2015)

Lab technician, Heska Corporation, Des Moines, Iowa (Class of 2014)

Medical scribe, ScribeAmerica, Hoboken, New Jersey (Class of 2015)

Naturalist, Arrowhead Outdoor Science School, Lake Arrowhead, California (Class of 2015)

Advanced naturalist intern, Audubon Center of the North Woods, Sandstone, Minnesota (Class of 2014)

Assistant education specialist and teacher-naturalist, Utah Division of Wildlife Resources, Hyrum, Utah (Class of 2014)

Laboratory senior technician, Roquette America Inc., Mount Pleasant, Iowa (Class of 2013)

Sterilization technician, VCA Animal Hospitals, Denver, Colorado (Class of 2013)

Physician assistant, Allina Health MD CARE, Minnetonka, Minnesota (Class of 2011)

Research assistant, University of Chicago, Chicago, Illinois (Class of 2008)

Information aid and educator, Iowa Department of Natural Resources, Mississippi River Museum, Dubuque, Iowa (Class of 2008)

Scientist, Integrated DNA Technologies, Coralville, Iowa (Class of 2008)

#### GRADUATE SCHOOLS ATTENDED

Ph.D. pharmacy, University of Minnesota, Minneapolis, Minnesota (Class of 2013)

M.S., biology, University of Western Illinois, Macomb, Illinois (Class of 2013)

M.A., biology, Miami University, Oxford, Ohio (Class of 2013)

M.S., biology, University of Minnesota, Minneapolis, Minnesota (Class of 2012)

Ph.D., geological studies, University of Iowa, Iowa City, Iowa (Class Of 2011)

M.S., biomedical science, Midwestern University (Class of 2011)

M.S., physician assistant studies, University of Iowa, Iowa City, Iowa (Class of 2011)

#### TAMMY MILDENSTEIN

*Assistant Professor of Biology*

Teaches courses in biology, including Ecology, Environmental Biology, Conservation Biology and Organismal Biology. She studies threatened flying foxes in Southeast Asia and Oceania. Most recently, she has taken students to Myanmar to study flying fox conservation. Her local research with students focuses on monarch butterfly conservation and involves prairie restoration projects. Ph.D. in Wildlife Biology, University of Montana, Missoula; B.S. Iowa State University.

#### BRIAN

**NOWAK-THOMPSON**

*Associate Professor of Biology and Chemistry*

Teaches courses in biology and chemistry, including Chemical Ecology, Cellular Biology, and Biochemistry. Students in his lab study the production of bacterial metabolites that inhibit plant pathogens. The bacteria producing these metabolites are sometimes used in place of agricultural pesticides to manage plant disease. Ph.D. and M.S., Oregon State University; B.S., Northland College.

#### CRAIG TEPPER

*Professor of Biology*

Teaches courses in biology, including Cell and Molecular Biology, Genetics, and Developmental Biology. His research with students focuses on molecular genetics and marine symbionts, and includes collaborations on coral bleaching and the loss of reef habitat in the Caribbean. Ph.D., Utah State University; M.S., San Diego State University; M.A., Indiana University; B.A., University of California, Santa Barbara.