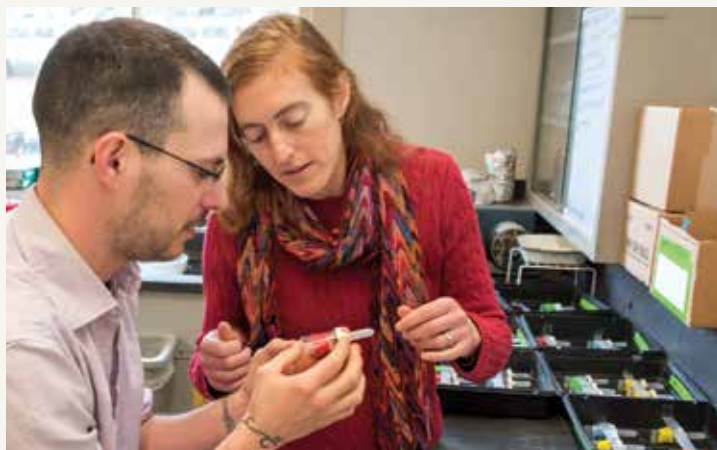


Science comes *naturally* at UMassAmherst



THE COLLEGE OF
NATURAL
SCIENCES



The CNS Advantage

Take classes taught by *award-winning* faculty.

Work in *state-of-the-art* facilities.

Join *faculty-directed* laboratories.

Pursue *independent research* interests.

Learn through *hands-on* laboratory experiences.



Marco Eres

CHEMICAL REACTION

In September of my freshman year, my dorm sponsored a series of faculty members talking about their research. I was curious and there was free pizza. Professor Dhandapani Venkataraman—everyone calls him DV—spoke about his nano-particle research. I just kept asking questions. I went to talk to him in his lab and I've been working there ever since. DV is very accessible. I see him every day in the lab. He's always asking our opinions about the research and he's been a huge help with career planning.

INDUSTRY EXPERIENCE

This summer I interned at Waters Corporation where I worked on a new liquid chromatography technology called the ionKey. I learned a lot about the business of science, how academic research is different from industrial research, and the kinds of things you have to take into consideration when you're designing your experiments. I really got a sense of the company, from research to sales.



MAJOR: Chemistry
FUTURE PLANS: graduate school in materials chemistry
FUN FACTS: Goldwater Scholar; research internship, Berlin, Germany; can juggle three pins; loves salsa dancing.

“Being in a research lab and having the resources of a large research university helped me get a summer internship in a lab in Berlin.”



MAJOR: Sustainable Food & Farming
FUTURE PLAN: help underprivileged urban communities gain access to fresh food
FUN FACT: Associate degree from the Culinary Institute of America (valedictorian)

Xochiquetzal Salazar

FRESH FOOD IS THE FUTURE

I love kids and I love food. I would love to work with underprivileged urban communities that don't have access to fresh food. Plant gardens in abandoned lots, get communities and parents involved, grow food and teach people how to cook with it. It would be super empowering to help people take back their food system and demand access to fresh, healthy food.

SUSTAINABLE UMASS

Here, I've found a great way to tie together two things that I really love, sustainability and food. I've learned so much already in such a short period of time. I've taken classes in botany, soil, permaculture, and sustainable agriculture, but also in fair labor, business planning, and integrated pest management.

THE POWER OF YOU

In Native American spirituality, when you are four or five years old, an elder gives you a kernel of corn to grow. You learn that it needs soil, sun, and water. But the elder reminds you that the seed also needs you to grow. The knowledge that I have the power to do something really good for the earth has been ingrained in me. Working with the Amherst School Garden Project has been my chance to give seeds to elementary school children and teach them that they have that power. It's hard to put into words how happy it makes me.

Keenan Mahan '14



MAJOR: Biochemistry & Molecular Biology
NOW: Harvard Medical School (class president and student council president)
FUN FACTS: Bio-TAP member and peer mentor; co-founded annual Pre-Health Sciences Networking Night; started Pre-medical Society volunteer program

UMASS BLINDED ME WITH SCIENCE

I chose UMass Amherst for its excellence across the sciences, the access to brand-new facilities, the opportunities to get involved in research, and the ability to take graduate classes. My UMass education gave me so much insight into the courses that I'm taking now. As a senior, I took a graduate class in drug design, which gives me an edge in some of the harder med school classes now.

QUANTUM LEAP

UMass is where I got my EMT license, where I became a CPR instructor, where I was able to really test out my leadership abilities with the Pre-med Society and other organizations. Having the opportunity to be involved in all these different groups is a big advantage of being at UMass. I also met all these amazing, open, available faculty! When I worked in Dr. Rebecca Spencer's lab, performing research on how sleep and memory are related, she encouraged me to explore my own interests, including traumatic brain injury.

"I would not be where I am without UMass Amherst. One of the great opportunities was UMass EMT. I'm not sure I would have had the opportunity to become an EMT at another school."

“My parents have associates degrees. I didn’t know what graduate school was until I got to college. I came thinking maybe I’d become a physician. After finding a passion for research, I’m applying for microbiology PhD programs.”

Garvin Dodard

FORMATIVE FIRST-YEAR EXPERIENCE

I’m in the Commonwealth Honors College and I was in the Science and Math Residential Academic Program (RAP) when I first came here. So I was surrounded by people who were all taking the same classes. Back at the dorm, I’d go to the common room to study because there would always be a bunch of people in the same classes as me, working on the same type of homework, and we’d all help each other.

MENTOR MAGIC

There are so many opportunities to dive into research here. I’ve been in Professor Michele Klingbeil’s lab since I was a sophomore. She’s an amazing mentor. She really cares about making sure you have the right mindset so you analyze things properly. She has taught me to think like a scientist.

FACULTY WHO CARE

My professors really want to help me learn. They’re very enthusiastic about what they’re teaching. They engage with students. Whether you’re in one of their labs or one of their classes they’re always trying to make you the best microbiologist you can be.

MAJOR: Microbiology
FUN FACTS: Commonwealth Honors College; intramural sports; teaching assistant for microbiology lab class; Research Experience for Undergraduates at the University of Georgia



Liz Pongratz

PERFECT ENVIRONMENT

At UMass Amherst, being exposed to a wide range of sustainability-related fields has helped me find a great direction for my career. I want to work on remediating our air, water, and soil. I’ve gotten the fundamentals that lead to that work, such as organic chemistry, toxicology, and environmental policy.

EUREKA EXPERIENCES

In taking advantage of all the opportunities here, I’ve learned what I’m passionate about. UMass has given me so many opportunities to become a more confident person, and to gain leadership skills. It’s rewarding because I get to be a part of institutional change and I get to help facilitate it.

SUSTAINABILITY BEGINS AT HOME

UMass Amherst is nationally rated for its sustainability accomplishments and offers lots of opportunities for students to be involved. My first semester I became an Eco-Rep, which offers academic credit to be a peer educator on sustainability. I wanted to be more involved, so my second semester I joined the Sustainability Fellowship Program, which works to implement change on campus. The fellowship coordinator was graduating and she asked me to take her place. I learned to coordinate the program and then I restructured it. The following summer I got an internship with a local cooperative that designs and installs solar arrays. They approached me because of my resumé, which was full of opportunities I’d been given at UMass Amherst.



MAJOR: Environmental Science
FUTURE PLANS: remediating our natural resources
FUN FACTS: Asked to run the Sustainability Fellowship Program as a sophomore

“My honors thesis advisor has been so amazing, connecting me with many resources. The more I reach out to faculty the more I realize how approachable and how attentive they are. They just want you to succeed.”



2014
DISTINGUISHED
TEACHING
AWARD
WINNER

Andy Danylchuk

TEACHING MATTERS

I take teaching very seriously. It's one of the most important parts of my job. I've spent a lot of time thinking about how I teach—and more importantly, how other people learn. During a lecture I will convey the same information in four or five different ways, based on my understanding that not everybody learns in the same way. Because of that, students have an opportunity to grasp complex information more easily. I find ways to get students to relate to the topic and personalize it, and engage them in problem-solving and integrated learning.

ENHANCING LEARNING RESEARCH

I'm always thinking of ways to engage undergraduates in research. Some join me in hands-on field work, and I also use a small aquaculture lab as a demonstration site. Even with a large class, I can bring that field experience to the students and enhance their learning experience. This also helps them better understand my research on bonefish and recreational fishing and how it influences international policy.

"I love teaching undergrads because they come into the learning situation with a much more open mind. They are looking for new ways to absorb information."

DEPARTMENT: Environmental Conservation
RESEARCH: best practices for the conservation of recreationally-targeted fish species, fish ecology; sustainable aquaculture; documentary filmmaking to convey ocean and fish issues

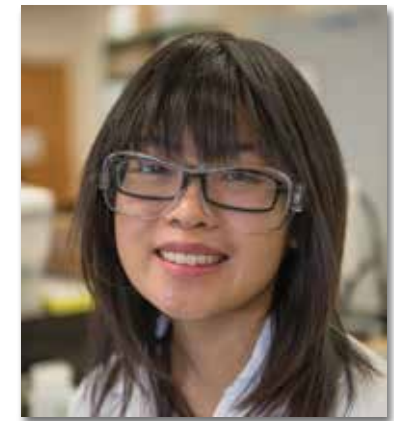
Lauren Lew

MY MAJOR FEEDS MY SOUL . . .

I'm a massive foodie. I chose this major because I want to learn the science behind food. You get to study a variety of different things that relate to food, from basics like biology, chemistry, and physics to applied courses in food microbiology, food chemistry, food analysis, and food processing. You have the opportunity to go into product development so it can be very creative as well.

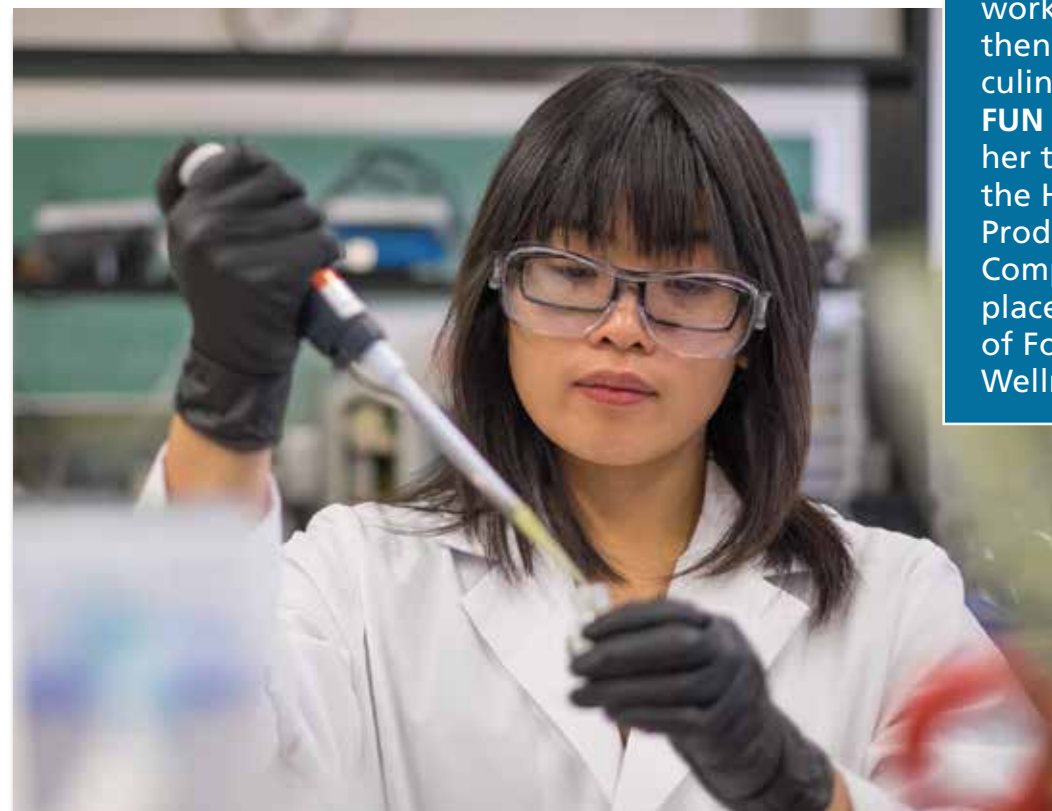
. . . AND PREPS MY FUTURE

Food Science at UMass is a small and tight-knit community. The professors know everyone by name. Classes are small, and offer great preparation for working in the industry—you get trained on the equipment and analysis methods you'll use in your job.



BASKIN-ROBBINS INTERNSHIP

A lot of what I learned at UMass came in handy in my internship. As a quality-assurance intern, I helped make sure products were in compliance with company standards. I also participated in sensory evaluations of new products, which basically means I got to eat a lot of ice cream!



MAJOR: Food Science
FUTURE PLANS: get work experience and then graduate or culinary school
FUN FACT: SmarTarts, her team's project for the Heart-Healthy Product Development Competition, won third place in the Institute of Food Technologists Wellness conference

State-of-the-art Facilities

THE INTEGRATIVE LEARNING CENTER

opened in fall 2014, offering 2,000 seats of modern classroom space loaded with the latest interactive instructional technology. Team-based learning classrooms (*pictured here*) are equipped with video screens, wall-mounted cameras, and desktop microphones for distance learning.

THE INTEGRATIVE SCIENCES BUILDING

opened in 2009 with 85,000 square feet of classrooms and teaching labs filled with \$4 million of cutting-edge instrumentation that students use on a daily basis.

THE LIFE SCIENCES LABORATORIES

opened in 2013, fully equipped to facilitate 21st century interdisciplinary research, scientific innovation, and technological advancement.

Outstanding Students

- 33% of CNS seniors graduate with honors.
- 36% of CNS students make the Dean's List.
- CNS students win national Goldwater and Fulbright scholarships on an annual basis.

Award-winning Teaching

- 50% of all University Distinguished Teaching Awards go to CNS faculty.
- CNS professors are dedicated to effective teaching in the classroom and committed to mentoring students.
- CNS faculty welcome undergraduates into their research labs.





MAJOR: Biology
FUN FACTS: Internship at Mass. General Hospital/Harvard Medical School; while taking a course in tropical biology, discovered a cheap, easy way to kill termite infestations in Belize

Frank Carellini

EVOLUTION OF A SCIENTIST

I work in Professor Abigail Jensen’s lab and I talk with her every day. Working in a research lab is really important for understanding how to do science. You can see what it’s like to be a successful researcher. You begin to think like them. You get true mentoring in a lab—you get to learn how to do science the right way and you can draw upon what they’ve personally taught you.

THE BIOLOGY OF EVERYTHING

Because I’ve been encouraged to take multiple approaches to learning biology and to integrate it with different disciplines, I’ve dabbled in courses that have exposed me to bio-engineering and bio-physics. Understanding how biology relates to other sciences is one of the most important skills to learn. Once you’re able to merge skills and approaches from different sciences, you’re able to tackle a problem at a much higher level.

“I chose UMass Amherst because I didn’t want to be stuck with a cookie-cutter curriculum. I really wanted to get into a lab. I really like the research community here and the labs are very intimate.”

Lynn Adler

RESEARCH AND TEACHING

Research and teaching are often set up as a dichotomy but I don’t think that has to be true. I love doing both. What I like most is teaching about skills rather than about facts. I like to teach about the research process. I designed my Experimental Methods in Ecology class to get students to think like scientists. They learn to pose—and answer—the important questions. What’s my hypothesis, how do I design an appropriate experiment, how do I think about controls, bias, and replication, how do I deal with the data, how do I communicate the results. It’s exciting to be part of that process.

EXCEPTIONAL UNDERGRADS

I love working with undergraduates! There are a lot of really smart undergrads here with really creative ideas and a lot of enthusiasm and initiative. It’s fun to see how students take their lab experience and use it to help figure out their own career goals. I love being a mentor—seeing where students are coming from and what they’re experiencing, and helping them get to where they’re going.

DEPARTMENT: Biology
RESEARCH: plant-insect interactions including bumblebees; ecology and evolution; agriculture
FUN FACT: An average of 15 undergrads work in her lab every semester, nine of whom have published their research

“I like to give undergraduate students research that’s more risky. It’s not going to make or break their career if they don’t get a cool answer, and they get a taste of what it’s like to do real science.”



Jordie Kamuene

IN THE LAB MY FIRST SEMESTER

I knew I wanted to work in a real research lab and UMass has a special program for first-year students. I work two to three days a week in the lab with the professor, a grad student, and another first-year student. We are trying to find out the role of specific proteins in the Suprachiasmatic nucleus (SCN), also known as the master clock, that plays a major role in regulating the sleep and wake cycles. We meet weekly with the professor to discuss the work and the articles we've been reading. I will present a research poster about our work at the end of the semester.

MAJOR: Biochemistry & Molecular Biology

FUTURE PLANS: career in industry, probably bio-manufacturing

FUN FACTS: originally from Democratic Republic of Congo; member, International Society for Pharmaceutical Engineering, Rotaract, and Biochemistry clubs

RESEARCH 101

I've learned lab skills, analytical skills, and how to work with others in a research lab. We have these discussions, we help each other out, so I'm developing team skills. Having experience working in a real research lab improves my chances of getting summer internships and working in another faculty lab.

HIGH IMPACT

I've learned that I really want to be a scientist. I want to go into industry, probably bio-manufacturing. I want to make an impact on the world, curing diseases and helping sick people. UMass Amherst has a one-year master's program where you learn to be a bio-technician. I can see myself doing that.

**CNS
FIRST-YEAR
RESEARCH
EXPERIENCE**



**SPECIAL
OPPORTUNITY
FOR FIRST-YEAR
STUDENTS**

iCons: Integrated Concentration in Science Program

"I learned so much about my abilities, and how they could be applied in every single context you could ever imagine."

iCons is a unique four-year interdisciplinary program that brings together students from a wide range of majors to tackle real-world problems from day one. Designed to produce the next generation of science leaders, the iCons curriculum builds expertise across disciplines and emphasizes student teamwork, laboratory experiments, and problem-solving skills.

MAJOR: Geosciences
ALSO: internship at the University of Minnesota; athlete tutor
FUTURE PLANS: graduate school in geology
FUN FACT: President of the UMass Amherst disc golf club, which typically goes to nationals every year



Paul Southard

GEOSCIENCES ROCKS

Geosciences has great professors and they are also really accessible. I've asked them questions even when I hadn't had them for a class. Almost all my classes have been small, around 30 people. I got the idea for my independent study during a class field trip. My professor, Sheila Seaman, was showing us something and said this would make a great project. So I proposed that I work on it with her.

SCIENCE IS INSTRUMENTAL

Every science class has labs where we use instruments and gain skills, from interpreting topographic maps to using a Brunton compass and mapping software. In my independent study with Dr. Seaman I look at thin sections of rock using a variety of machines: FTIR, XRF, an electron microprobe. But it's much more than just how to use the instruments—you learn how to pose the problem and go about solving it. They don't just give you the data and tell you what to do.

"People think a school has to be small to offer opportunities, but everything is here at UMass. There's so much going on here, a lot of research, so many different classes to choose from."



"Having so many opportunities to get involved has been the most valuable part of my academic experience."

Rachel Rosen

THE VIEW FROM ABROAD

Spending my junior year in Montpellier, France, was a life-changing experience. I learned life skills that I'll use the rest of my life. I learned about other cultures, about other ways of teaching and learning. I'm much more competent in French and I learned to be more independent and resourceful. I've become a more adventurous person. I know this whole experience will help me when it comes time to apply to graduate schools. And most importantly, I learned about myself. I recommend the experience for everyone.

BACK ON CAMPUS

I truly feel close to several mentors—professors. Whenever I have problems of any kind, need advice, or just good conversation, they are always there for support. I feel like I play an important role as a student here. The things I do make a difference and I am making a contribution to the UMass Amherst community.



MAJOR: Psychology
ALSO: teaching assistant; works in the Infant Cognition Lab; club soccer
FUTURE PLANS: PhD in psychology



“UMass Amherst literally got me my job. The skills I learned there will benefit me for the rest of my life.”

Kevin Cavanaugh '14

DOING THE MATH

I became a math major because it's something I can do that not too many others can. UMass has a very strong math department, and my classes definitely prepared me for my career. But more than the calculus, probability, and statistics, at UMass I learned to become a life-long learner. I learned how to adapt to a situation and figure out a problem that is seemingly impossible to solve. Without the foundation that I built at UMass, I do not know where I would be today.

CAREER CONNECTIONS

My friends and I formed the UMass Amherst Actuarial Club, which has hosted speakers, held career workshops, and created a resumé book to share with companies. We offered support and information about actuarial science in general, as well as built a lot of interest in and awareness on campus of actuarial science professions.



MAJOR: Mathematics & Statistics
CAREER: actuarial analyst, Mercer Retirement
FUN FACT: Ran Kevin's Painting Company for three years while in college: created a business plan, developed estimates for more than 100 houses, and managed 10 employees

Building the Future



The College of Natural Sciences is dedicated to training and advancing the next generation of scientific leaders, problem-solvers, and workplace innovators, as demonstrated by these examples of where recent CNS graduates have researched, worked, and studied:

INTERNSHIPS

- Abbott Laboratories
- American Cancer Society
- Beth Israel Deaconess Medical Center
- Boston Biochem
- Cisco Systems
- GlaxoSmithKline
- MIT Lincoln Laboratory
- NASA Langley Research Center
- The Nature Conservancy
- Pfizer
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency

FULL-TIME EMPLOYMENT

- Brigham and Women's Hospital
- Center for EcoTechnology
- DuPont
- Genzyme
- IBM
- JELD-WEN
- Johnson & Johnson
- Kraft Foods
- Massachusetts General Hospital
- MathWorks
- McLean Hospital
- Procter & Gamble

GRADUATE SCHOOLS

- Boston University
- George Washington University Law School
- Harvard University
- Massachusetts Institute of Technology
- New York University
- University of California, Berkeley
- University of California, San Diego
- University of Colorado
- University of Maryland
- University of Massachusetts Medical School
- University of North Carolina at Chapel Hill
- Yale University

Photos © Jim Gipe / Pivot Media and Pawlok Dass

Integrated Sciences Building



Majors

Animal Science (BS)
Astronomy (BA, BS)
Biochemistry & Molecular Biology (BA, BS)
Biology (BA, BS)
Building & Construction Technology (BS)
Chemistry (BA, BS)
Earth Systems (BS)
Environmental Science (BS)
Food Science (BS)
Geography (BA, BS)
Geology (BA, BS)

Mathematics & Statistics (BA, BS)
Microbiology (BS)
Natural Resources Conservation (BS)
Physics (BA, BS)
Plant, Soil & Insect Sciences (BS)
Pre-veterinary (BS)
Psychology (BA, BS)
Science (BS)
Sustainable Food & Farming (BS)
Sustainable Horticulture (BS)
Turfgrass Science & Management (BS)

*Pre-medical/pre-health curricula and advising

www.cns.umass.edu

THE COLLEGE OF
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UMASS
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