



University of New Haven

TAGLIATELA COLLEGE OF ENGINEERING

**BEST
COLLEGES**

U.S. News & WORLD REPORT

UNDERGRADUATE ENGINEERING
2014



HOW TO DO EVERYTHING



WHY CHOOSE



DEAN'S MESSAGE

The Tagliatela College of Engineering at UNH is the only institution of higher education in Connecticut that offers seven nationally accredited engineering programs. Its primary focus is the education of individuals for rewarding careers in a competitive marketplace. To that end, we expose our students to the formulation and solution of real-world problems using modern computer tools and well-integrated laboratory experiences.

Thanks to our small class sizes, students receive more individual attention than they would get at a large university. And while our programs are rigorous, our instructors collaborate directly with students to help them meet the challenges.

If you're interested in a dynamic profession that requires technical skills and knowledge, judgment, creativity, and teamwork to solve the most important, interesting, and challenging problems facing society today, why not contact our admissions office to schedule a visit to the College. We hope to see you soon!

Sincerely,

Ronald S. Harichandran, Ph.D., P.E., F.ASCE
Dean, Tagliatela College of Engineering

ENGINEERING AT UNH?

The 21st century is an incredibly exciting time to enter the engineering and applied science fields. Changes in the workplace are of such magnitude that it has amounted to a paradigm shift in both methodology and practice. The Tagliatela College of Engineering has kept pace with these changes, adapting our programs so that our graduates can contribute to their fields as soon as they enter the work force.

OUTSTANDING FACULTY

The faculty in the Tagliatela College of Engineering are among the most dedicated, hardworking and amiable people in higher education today. That comes directly from someone who has seen them in action, year after year, under every circumstance, and with students of every background and ability — Dean Harichandran. But our faculty are much more than salt of the earth types. They are people of vision. The year 2020 is where they are training their sights.

Recognizing the need for a totally new approach to the way engineering and computer science professionals are trained, our professors designed the Multidisciplinary Engineering Foundation Spiral Curriculum — a four-year sequence of engineering courses, matched closely with the development of students' mathematical sophistication and analytical capabilities, and integrated with coursework in the sciences. The resulting degree programs are designed to produce a new breed of professional — a 21st century Renaissance engineer or scientist.

OUTSTANDING FACILITIES

Our facilities are extensive, and reside precisely on the cutting edge of technology. Prospective freshmen take note: You'll have access to our first-rate laboratories from year one.

You'll see engineering and applied science principles in action at our Multidisciplinary Foundation Laboratory; the Instrumentation and Mechanics Laboratory; the Thermo/Fluids Laboratory; the Interfacing and Control Laboratory; the Cyber Forensics Laboratory; and the Wireless Networking Laboratory. Our state-of-the-art multiuse labs fuse lecture, learning, practice, collaboration and computing zones. Reconfigurable desks and worktables allow for innovative learning practices, and the use of Smart Classroom technology.

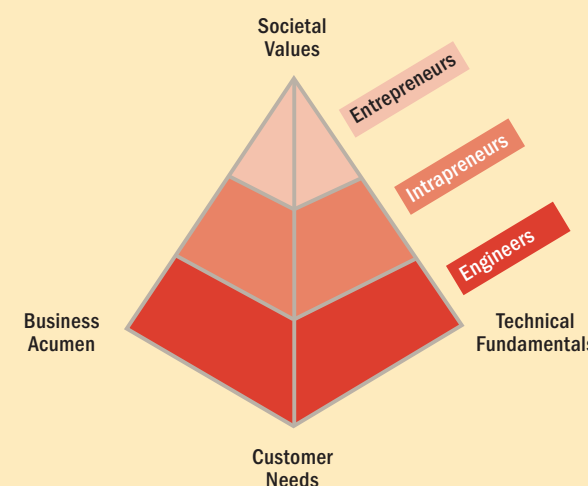
Freshmen can also participate in our Engineering Living Learning Community (LLC) and our new Entrepreneurial Engineering LLC. These are groups of first-year engineering students who occupy a residence hall wing together, take two core courses together, participate in activities centered on engineering and entrepreneurial thinking, and generally help each other make the transition to college life while forming networks that can last their entire life.

INTEGRATED TECHNICAL COMMUNICATIONS PROGRAM

Employers look for strong technical communications skills when hiring engineering graduates. Repeated practice and effort is required to learn how to communicate effectively in written, oral, and visual forms. Therefore, we expose engineering and computer science students to a variety of technical communication products in an integrated program that spans all four years of their study. The skills they develop will enable our graduates to stand out in the engineering marketplace.

ENTREPRENEURIAL THINKING AND INNOVATION

In order to maintain American leadership in engineering and technology, U.S. engineers must be innovative and entrepreneurially minded. As a member of the Kern Entrepreneurship Education Network, we have activities integrated into engineering coursework and extracurricular programs that stimulate students to develop technical solutions that address customer needs while being ever mindful of societal values. At the same time, our students learn the business acumen needed to contribute to business success.



MODERN AND RELEVANT FOCUS AREAS

In most majors, students can develop a specialization in a modern and relevant focus area. We offer the following focus areas that will make our graduates highly sought after in the decades to come:



RENEWABLE ENERGY

The nation and the world are facing challenges in fulfilling society's ever-growing demand for energy while conserving fossil fuels and reducing carbon emissions. Energy derived from sources such as solar, wind, geothermal, and biofuels is increasingly being developed to supplement fossil fuels.



SUSTAINABILITY

Development of products and services that conserve our natural resources for future generations is a hallmark of sustainable societies. Sustainability requires a balanced consideration of societal needs, economics, and the environment. Small and large companies, as well as government agencies, are giving more and more attention to sustainable development.



WIRELESS COMMUNICATION

Many of the electronic devices that enhance our daily lives communicate wirelessly. In time, wireless communication will become ubiquitous in all of our lives, and more and more of our business and personal equipment will be built to communicate data wirelessly.



CYBER FORENSICS

With computers being used in every aspect of business and personal productivity and communication, they are also being increasingly used for committing crimes. Digital devices are a rich source of evidence for detecting and prosecuting criminals. Organizations are rapidly growing their cybersecurity and incident response capacity.

OUTSTANDING CAREERS

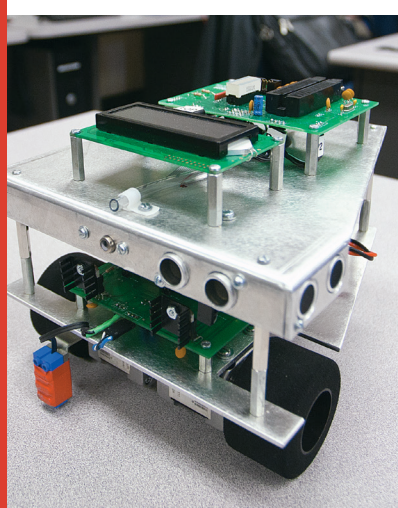
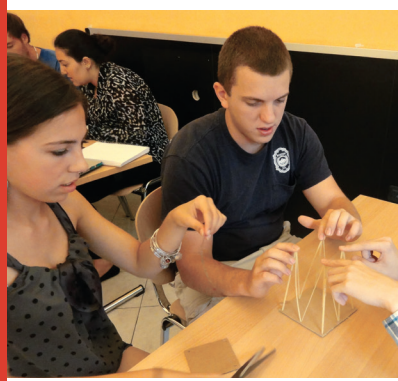
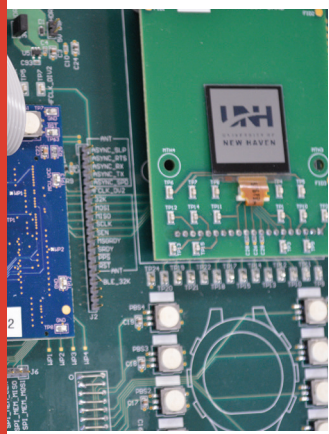
Every faculty member, facility, lecture, club, or activity in the Tagliatela College of Engineering has one design — to excite your love for the art and science of engineering and help you make a stunningly successful career of it. For the 21st century Renaissance engineer, there are amazing breakthroughs on the horizon. They will come about in the same way they did during the first Renaissance — through a rethinking of the established ways and methods and a new ideal that puts humanity at the center of creative works.

This will come naturally to engineers, who are trained to apply technology to human needs in innovative ways. With the Tagliatela College of Engineering, and the resources of the University's Career Development Center to help, you'll have all the tools you need to become a dynamic part of this extraordinary new era.

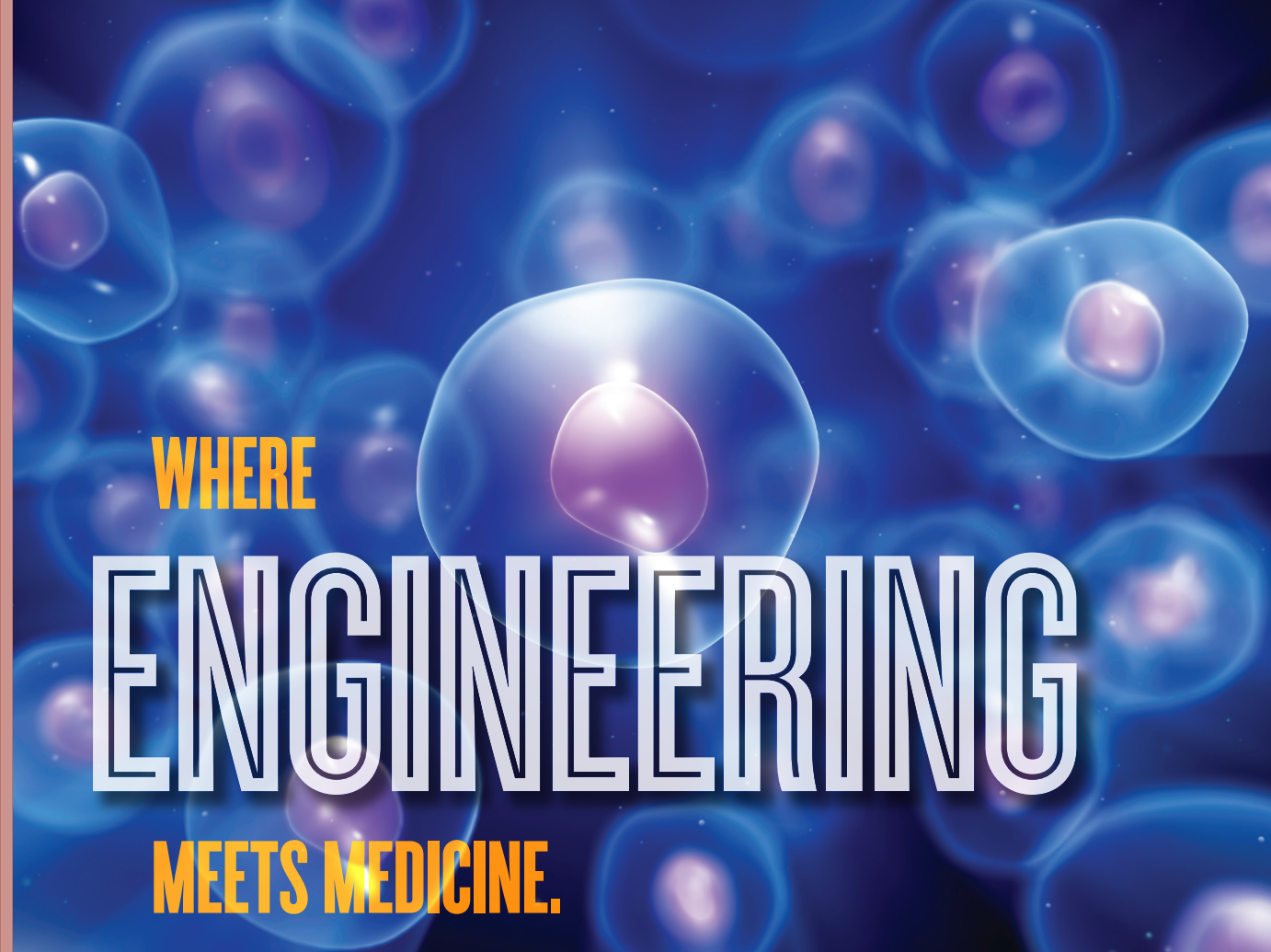
One last word: yes, engineering is serious. But it's also exhilarating and fun. It's a great — at times, wild — ride. We very much hope you'll join us for the trip!

TAGLIATELA COLLEGE OF ENGINEERING

Chemical Engineering*	Information Technology
Chemistry	• Network Administration and Security
Civil Engineering*	• Web and Database Development
Computer Engineering*	Mechanical Engineering*
Computer Science*	System Engineering*
Cyber Forensics †	Undecided (Engineering)
Cybersecurity †	
Electrical Engineering*	*ABET accredited
General Engineering	†Focus area of study
• Biomedical Engineering †	
• Business †	
• Education †	
• Sustainability †	



BIOMEDICAL ENGINEERING



WHERE
ENGINEERING
MEETS MEDICINE.

BIOMEDICAL ENGINEERING

WHEN YOUR END-USERS ARE PATIENTS.

Think artificial heart. Regenerative tissue growth. Biopharmaceuticals. They're all innovations in the field of biomedical engineering, one of the most exciting fields of the 21st century. It unites the engineer's design and problem-solving skills with knowledge of the biological sciences to make a radical difference in people's lives and health.

UNH offers a Biomedical Engineering Certificate to all engineering and science majors. It's a 15-credit program, as well as a focus area within General Engineering, that opens up a lot of career doors in addition to the ones associated with your major. You'll be able to add pharmaceutical, medical device and biologics firms to your list of dream companies. Plan on applying to medical school? Having biomedical engineering on your résumé will help make you a standout.

Whatever your path, you'll have a much broader perspective — because your eyes will have been opened to the miraculous possibilities and advances on the horizon.



OUT OF THE
TEST TUBE
AND INTO MASS PRODUCTION.

CHEMICAL ENGINEERING

WHERE CHEMISTRY MEETS COMMERCIAL USE.

The transformation of matter or energy into forms that benefit human beings is both the definition and the beauty of chemical engineering. Of all the engineering disciplines, this one is the broadest, pulling into its orbit the sciences of chemistry, physics and biology, as well as mathematics.

The fully accredited Chemical Engineering major at UNH gives you a rock-solid foundation for a career in pharmaceuticals, consumer products, fuel cells, energy products, environmental services, electronics, or biotechnology. Judgment and creativity are stressed in the program — especially critical in the 21st century, as chemical engineers rise to the challenges of environmental integrity, limited resources, and human safety on a global scale.

With small classes and individual attention from instructors, you'll have a chance to thrive. And with state-of-the-art labs and equipment that live up to industry standards, you'll start rising to those 21st century challenges even before you graduate.

CHEMICAL ENGINEERING



GETTING A
REACTION.

CHEMISTRY

HOW ONE MOLECULE BEHAVES TOWARD ANOTHER.

Far more than just the study of how chemical substances interact, chemistry demands (yes, demands) a much deeper perspective. Known as the “central science,” chemistry connects with physics and math on one side, biology and medicine on another, and earth and environmental sciences on a third.

Not the reclusive, tunnel-visioned lab dwellers some people think of, chemists are diverse thinking, dynamic professionals with extensive career options. At UNH, our B.S. in chemistry is uniquely flexible in that it lets you concentrate, minor, or double major in related fields. Think double major in chemistry and forensic science. Or, a career in drug discovery for a major pharmaceutical firm. Of course, medicine and nursing are naturals, as is teaching. Those are just a few of your possible paths.

Our chemistry program is rigorous, but you’ll thrive in small classes — taught only by professors, not grad students — use only modern instruments, and have the internship opportunities that make this demanding science well worth your commitment.



THE FEATS THAT CHANGED
HISTORY.

CIVIL ENGINEERING

THE DESTINY OF A NATION IS BUILT ON IT.

Without roads, bridges, tunnels, dams, railroads, airports, and — most of all — without water that doesn’t make you sick when you drink it — where would we be? Where would a country be? The safety, health and welfare of the public are the true vocation of the civil engineer. In fact, civil engineers have saved more lives, through clean water and sanitation systems, than all the doctors in history.

Planning and designing new infrastructure and maintaining existing structures are phenomenal undertakings. Civil engineers are the creative thinkers and problem solvers that make it all happen. At UNH, we make it happen for you with a B.S. degree program that integrates mathematics, basic and engineering sciences, communication, humanities and social sciences, with a general base of civil engineering technologies.

Electives in your particular civil engineering focus, plus numerous opportunities to interact with practicing professionals, will help you lay the kind of foundation a great career is built on.

AN
ALGORITHM
 FOR EVERY OCCASION.

CREATING THE FASTEST
THINKERS
 ON THE PLANET.

COMPUTER SCIENCE

HOW HUMANS AND COMPUTERS HAVE A CONVERSATION.

We talk to a computer in its language. It answers us in ours. Pretty amazing. But more than that, the conversations are continuing to expand in both scope and complexity. No one will be in greater demand, therefore, than the computer scientist — the person who makes those conversations happen.

Creating algorithms that instruct a computer how to answer our questions, acquiring a solid understanding of hardware, software and theory, and designing and implementing a system for a real application are some of the skills you'll acquire with a Bachelor's in Computer Science at UNH. At the same time, you'll expand your horizons by choosing a field of interest, whether it is cyber forensics, wireless communication, cybersecurity, or something else, where you can put those skills to use. Some students choose to minor in mathematics, engineering, business, social sciences and multimedia.

The computer connection to our lives is permanent. Whatever field you pursue, a degree in computer science will give you an undeniable advantage.

COMPUTER ENGINEERING

THE INCREDIBLE RELATIONSHIP BETWEEN HUMAN AND ARTIFICIAL INTELLIGENCE.

Information, please. And make it snappy. That about sums up why we invented, and continue to evolve, computers. The first computers made tedious mathematic calculations in seconds, instead of the minutes or hours it used to take us. They were — and still are — our servants, but their job description has expanded beyond anything imagined sixty years ago.

The Bachelor of Science program in Computer Engineering at UNH puts you on the leading edge of computer evolution, thanks to a solid foundation in both hardware design and software engineering. In fact, you'll be immersed in the design experience throughout your studies, which culminate in a design project during your senior year. Add to that the experiential learning you gain through internship and co-op programs, and you'll have the confidence and skills you need for that most critical interface — the job interview.

Computer "intelligence" will continue to evolve. It's our goal to make you the brains behind it.



ELECTRONS

TELLING
WHERE TO GO.



ENGINEERING

A DEGREE PROGRAM.

ELECTRICAL ENGINEERING

HARNESSING THE AWESOME POWER OF NEGATIVELY CHARGED PARTICLES.

Power plants. Radio. Television. Cell phones. Biomedical devices. Fiber optics. Computers. Robots. These barely even scratch the surface of what electrons in motion can do with the creative help of electrical engineers.

Electrical engineers study the behavior of electrons in three areas — electricity, electronics and electromagnetism. They design, develop and oversee the operation of electrical and electronic systems. The Bachelor of Science program in Electrical Engineering at UNH puts you on the cutting edge of the field with a multidisciplinary approach that incorporates newly designed project-oriented courses. You'll get real-world experience through the department's dynamic internship program — which often leads to permanent employment after graduation — and cap off your studies by designing your own pièce de résistance in your senior year.

Want to give your electrical engineering degree some more juice? You can double-major with computer engineering or computer science with just one additional year of study.

GENERAL ENGINEERING

THE MAJOR THAT LETS YOU DESIGN YOUR OWN COURSE OF STUDY.

Say you're attracted to the field of engineering. You have the logical mind, the ability to focus, and an appreciation of the engineering discipline, its many feats and potential for even greater ones. But you like the idea of combining engineering knowledge with some other field — blazing your own trail.

The Bachelor of Science program in General Engineering was made for you. During the first three semesters, you'll take the same foundation courses as students in specific engineering majors, gain insight into all of them, and learn practical skills. On the other hand, if you're looking to go off on more of a tangent, career-wise, this major will allow you to focus on biomedical engineering, sustainability, business, or K-12 science education. You can combine general engineering with a minor in any undergraduate discipline in the University.



HOW WE MANAGE
INFO.

INFORMATION TECHNOLOGY

THE EFFECTIVE DELIVERY OF EVERYTHING WE KNOW OR WANT TO KNOW.

“I just want it to work!” That’s a familiar refrain among most end-users of technology. Results-oriented, they’re not all that interested in how it happens. That’s where the Information or Cyber Systems Tech comes in — making that human/computer interface as successful and user-friendly as possible.

Our B.S. program in Information Technology differs from Computer Science in that it focuses on the more hands-on, less technically rigorous aspects of applications development and network design and administration. Still, you’ll get a solid grounding in practical and conceptual information technologies and a good feel for the intricacies of computer hardware and software.

The Bureau of Labor Statistics ranks specific areas of Information Technology and Cyber Systems as the fastest-growing over the next ten years.



MACHINERY
OF CIVILIZATION.

MECHANICAL ENGINEERING

HOW WE GET THINGS MOVING.

The real wheel of fortune? That was the one invented around 8,000 B.C. Considered the most important mechanical invention in the history of the human race, the wheel represented the birth of mechanical engineering. It’s also a fundamental component in every mechanized system designed and implemented since the Industrial Revolution.

Mechanical engineering applies the principles of physics and material sciences to the analysis, design, manufacture and upkeep of mechanical systems. Its interests span the colossal — space vehicles, for example — all the way down to miniscule nano machines. The UNH Bachelor’s program immerses you in this fascinating field with opportunities for hands-on learning that is based on a firm understanding of theory and allows you to focus on renewable energy, mechatronics, or system engineering if you desire. You’ll learn analysis and design on the same computer tools you’ll find in the industry. And — unlike in many colleges — your instructors will all be full-time faculty members, never graduate students.

Sikorsky, Pratt & Whitney, Pitney Bowes, and Covidien are some of the companies that have hired graduates from our program. Let us get you moving in the same direction.



SYSTEM ENGINEERING

**DESIGNING, MANAGING — AND FIXING —
THE MOST COMPLEX SYSTEMS IN THE WORLD.**

Today's systems are enormously complex, involving multiple engineering disciplines. Mechanical, chemical, computer, civil, and other types of engineers may all work on the same project, each focusing narrowly on his or her area. Who sees the big picture? Who designs the process that smoothly integrates everybody's contribution so the project is a success? The system engineer.

The system engineer must also provide cost effective solutions to operational or design flaws. Adding to the challenges, the global economy has thrown its own wrench into the works — domestic and foreign platforms are frequently incompatible. Phenomenal preparation is obviously priority #1 for this field, and our B.S. program provides it. In fact, the design of the program itself was a team effort — combining the input of future employers, alumni, business and industry pros, students, and faculty.

The end product is an innovative, foot-in-the-door program that gives you a competitive advantage in products, processes and operations — heavy on simulation modeling and analysis techniques. But first analyze this: At the same time, the demand for trained system engineers is skyrocketing, you'll be studying in one of the few undergraduate system engineering programs in the U.S.

CYBERSECURITY, CYBER FORENSICS, WIRELESS NETWORKING

**WHETHER IT'S WIRED OR WIRELESS, A COMPUTER CAN
EITHER BE A CRIME SOLVER — OR A HOSTILE WITNESS.**

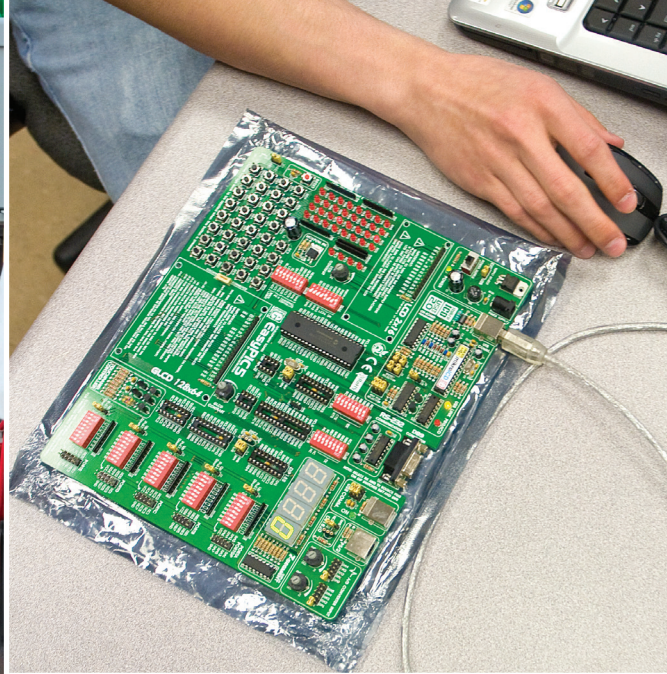
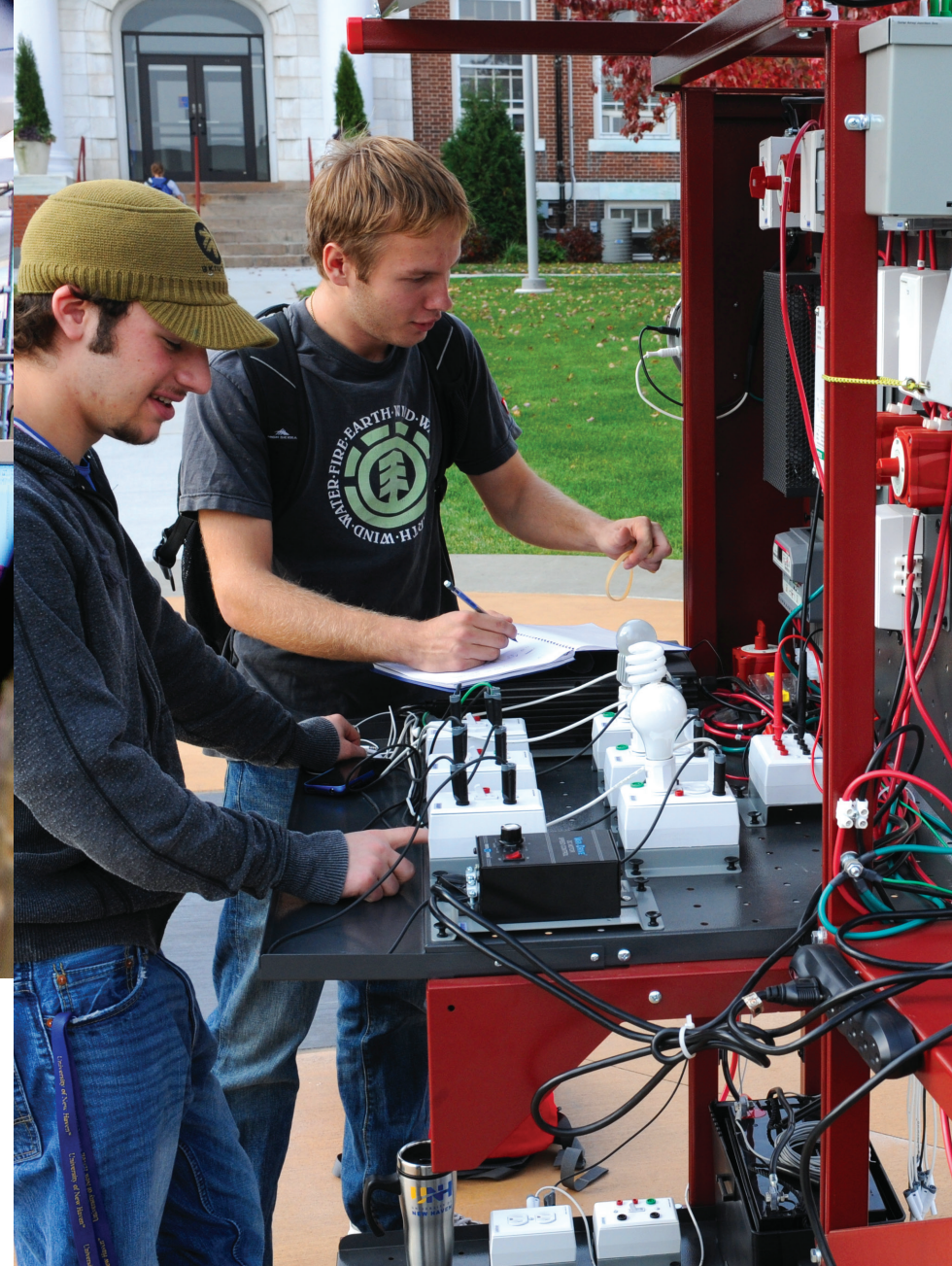
If you're a crime victim or digital forensics investigator, the device is on your side. If you're a criminal, it can be your worst enemy. There's a wealth of evidence just waiting to be discovered on computers, and there's a growing body of specialists who know how to examine these devices.

The field of discovery runs from state-of-the-art, small-scale digital devices such as smartphones to huge hard-drives containing thousands of gigabytes of data. The career disciplines related to them — cyber forensics, cybersecurity, and wireless networking — start here, with majors in Computer Science and Information Technology, tailored through your electives to focus on your interests.

The courses? A wide range of introductory and advanced hands-on courses focusing on cyber forensics, cybersecurity and enterprise networking. The career outlook? The job market in the domain of cyber forensics and cybersecurity is so strong that many of our students are receiving lucrative job offers before finishing their degrees.



PRACTICE WHAT THEY
TEACH



TIME TO SPREAD YOUR WINGS.

Practical experience is a must-have for engineers-in-the-making. UNH gives you many opportunities to try out what your instructors have taught you, learn from doing, and develop your independence:

Senior Design Projects. In previous years, we asked students to develop their own projects. We've replaced that with a better idea: asking local industries for suggestions on real-world project scenarios for students to tackle. Some corporations that have participated and provided funding: Sikorsky Aircraft, ASML, Otis Elevator, Z-Medica, The Henkel Corporation, Hamilton Sundstrand, Roller Bearing Corporation and Fuel-Cell Energy, Inc.

Engineer-in-Residence Program. This program gives students a golden opportunity to work on real industry projects under the direct supervision of practicing engineers from local and regional companies. Through the UNH-Sikorsky Aircraft Engineering Internship program, students work at Sikorsky. In the Engineer-Entrepreneur-in-Residence program with iDevices, students work with iDevices engineers at our new Orange Campus. Thanks to rave reviews from students and engineers, other engineering firms have also expressed an interest in joining.

Faculty-Mentored Undergraduate Research. Here's a chance to collaborate with your instructor through independent study, laboratory research, or a thesis topic. You'll enjoy support from the University, governmental agencies and engineering firms. The big finale: an undergraduate thesis and your appearance at a professional-quality seminar at which you'll present your findings.

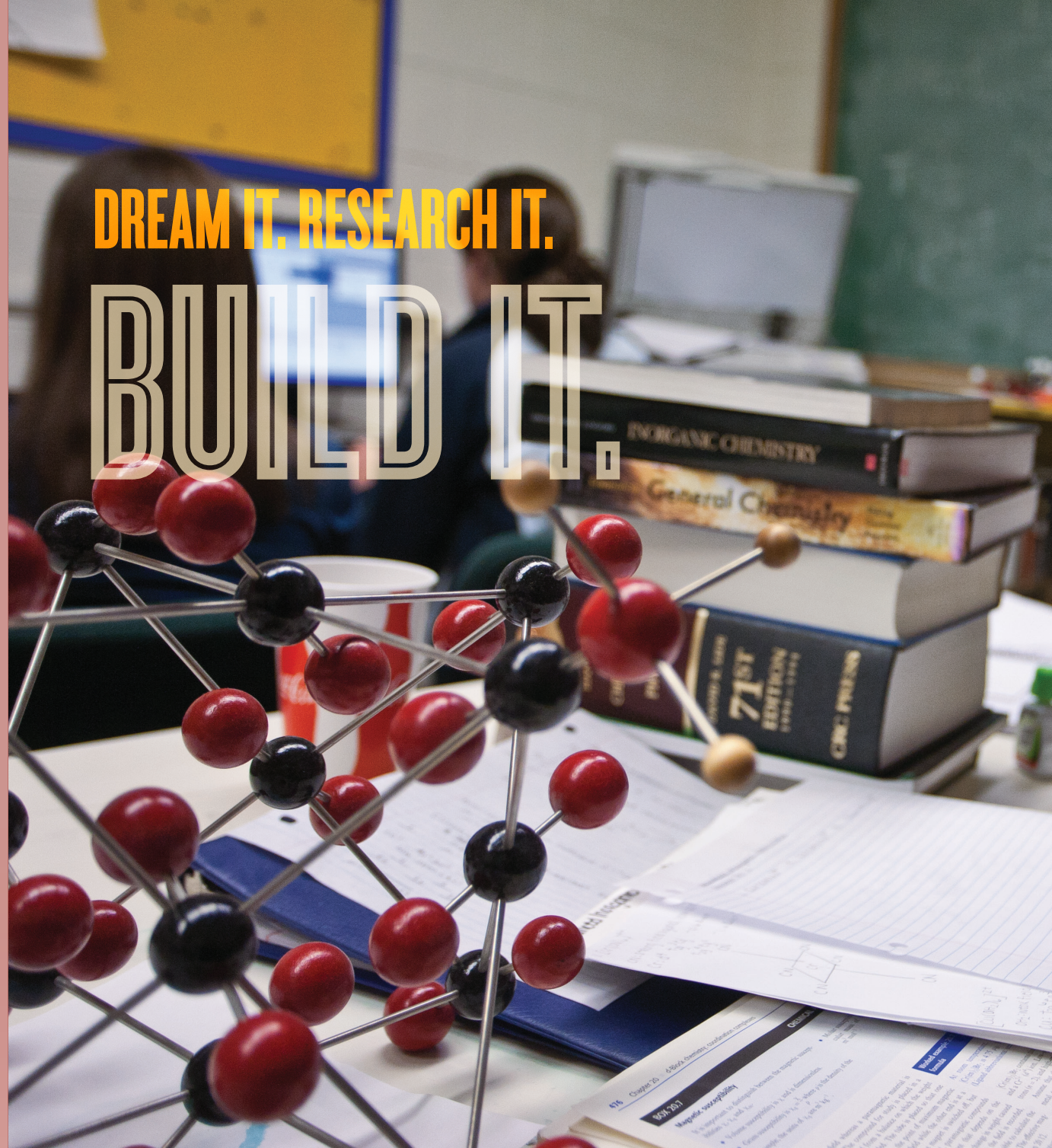
Internships. UNH engineering and applied science students are in high demand as interns. Their talent and expertise are recognized by many companies, locally and throughout the region. Along with a site mentor, students have the guidance of a faculty advisor during their stints at companies like Sikorsky Aircraft, Covidien, FAST, Inc., Pratt and Whitney, United Illuminating, Unilever, Pfizer, Pitney Bowes, and other firms across the U.S.

Study Abroad. Study abroad programs in engineering are very rare because of the difficulty in finding matching courses at foreign institutions. We offer an exciting semester-long study abroad program at the UNH campus in Prato, Italy during the fall of freshmen year. A cohort of engineering students can take Calculus, Chemistry, Introduction to Engineering, Italian language, and Italian culture courses at the same cost of taking courses at the West Haven campus. Studying abroad allows students to become familiar with international cultures and settings that are ever so important in a global marketplace.

Living/Learning Community. Open to freshmen, this program groups engineering students together and houses them in a dedicated residence hall wing. It's a great way to transition from high school to college life — you'll have the opportunity to bond with your classmates both in and out of the classroom, as well as receive individual attention from faculty and staff who visit regularly.

DREAM IT. RESEARCH IT.

BUILD IT.



DOING IS KNOWING.

In keeping with the University's focus on experiential education, we incorporate undergraduate student research as a key component of our engineering programs. This sets us apart. While most colleges reserve research for graduate students and faculty, we believe in allowing our undergraduate students to participate in high-level research in order to further enhance their résumés. This is especially evident in the Tagliatela College of Engineering, where our undergraduates work on a variety of projects and participate in national competitions.



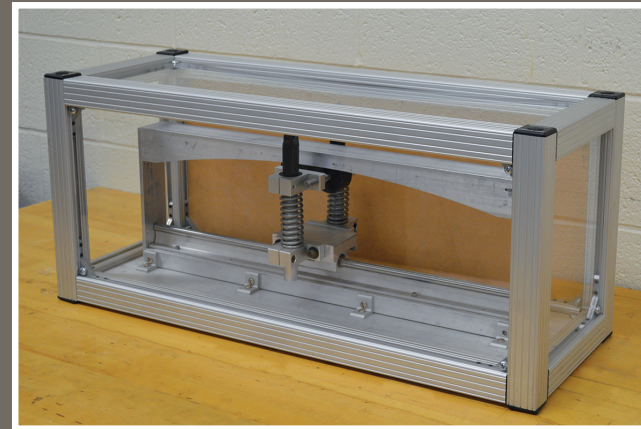
LOW-WEIGHT ANTI-VIBRATION ACTUATOR

Team members: John Capozzo, Matthew Cocuzzo, Robert Lucas, and Demetrios Xenikakis (Mechanical Engineering)

Faculty Advisor: Dr. Ismail Orabi

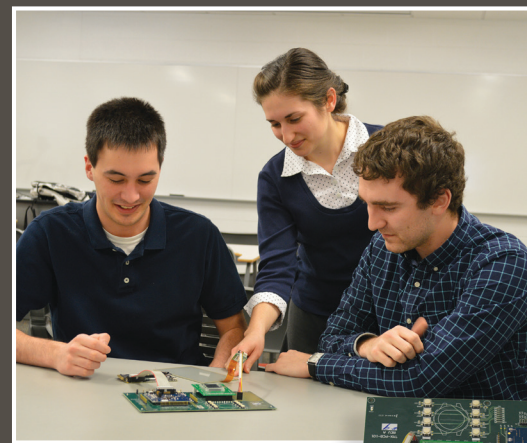
Industry Advisor: Bill Welsh

Sponsor: Sikorsky Aircraft Corporation — designers and builders of the world's most advanced helicopters for commercial, industrial, and military uses.



During flight, a helicopter's spinning rotors create vibration that rattles the helicopter. To reduce this vibration, the current UH-60 Helicopter utilizes about 275 lbs. of anti-vibration weight. The current electrical vibration suppression system weighs approximately 35 lbs. per unit, with multiple units installed per aircraft.

The goal of this project was to design an active vibration-control system to create a counter-vibratory force applied at specific points in the aircraft to reduce the overall vibration experience in flight. The weight reduction would allow for the helicopter to carry more weight, supplies, or additional people.



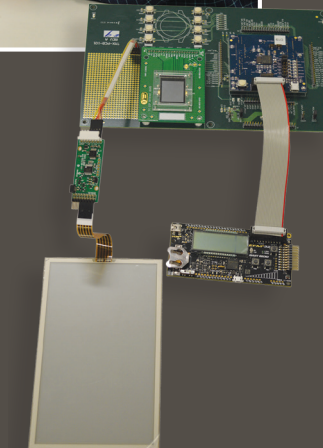
INNOVATIVE USER INTERFACE / USER EXPERIENCE WATCH DESIGN

Team members: Grace Cotnoir (System Engineering), Paul Kazmierski, and Michael Maguire (Computer Engineering)

Faculty Advisor: Dr. Bijan Karimi and Dr. Amy Thompson

Industry Advisor: Frank Ramirez

Sponsor: Timex Group — designers, manufacturers, and marketers of innovative timepieces and jewelry globally.



The goal of the project was to use system engineering and computer engineering approaches to create an innovative user interface/user experience watch design that makes use of graphic displays and sensors as alternatives to buttons for user interaction. This design may replace the traditional digital watch user interface in an effort to increase Timex's competitiveness in the sports-watch market.

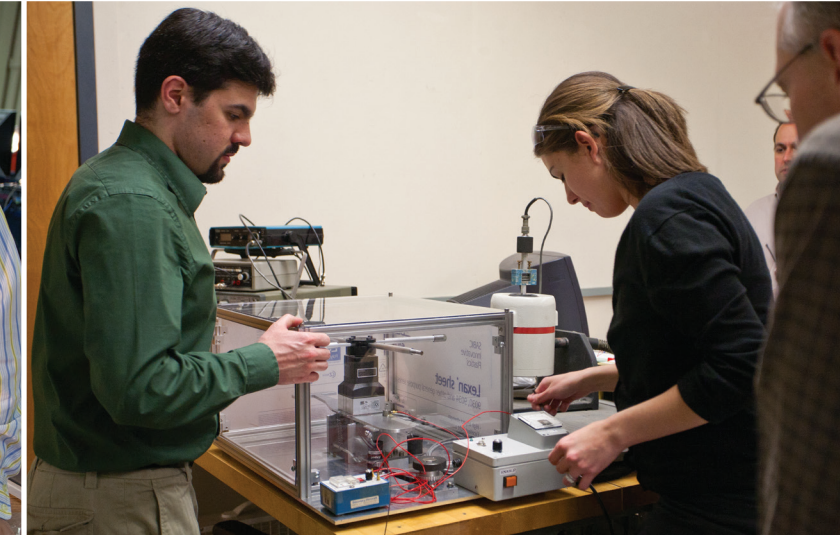
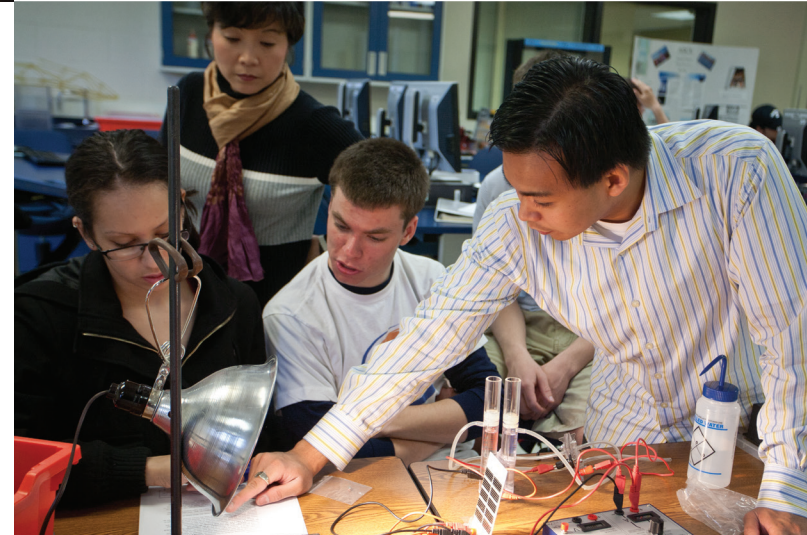


LABS AND OTHER LEARNING FACILITIES.

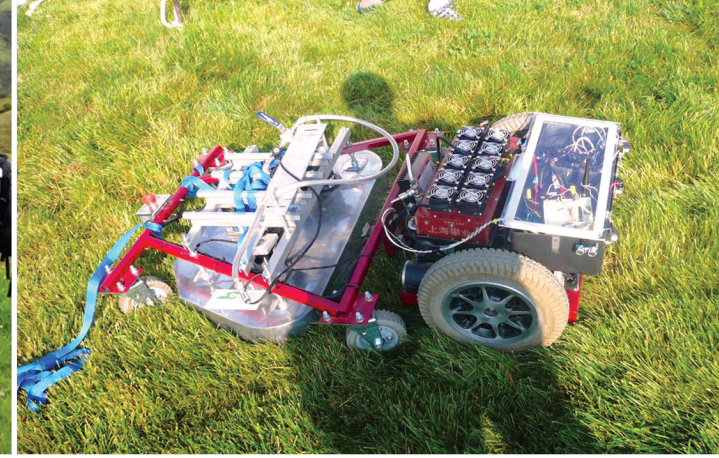
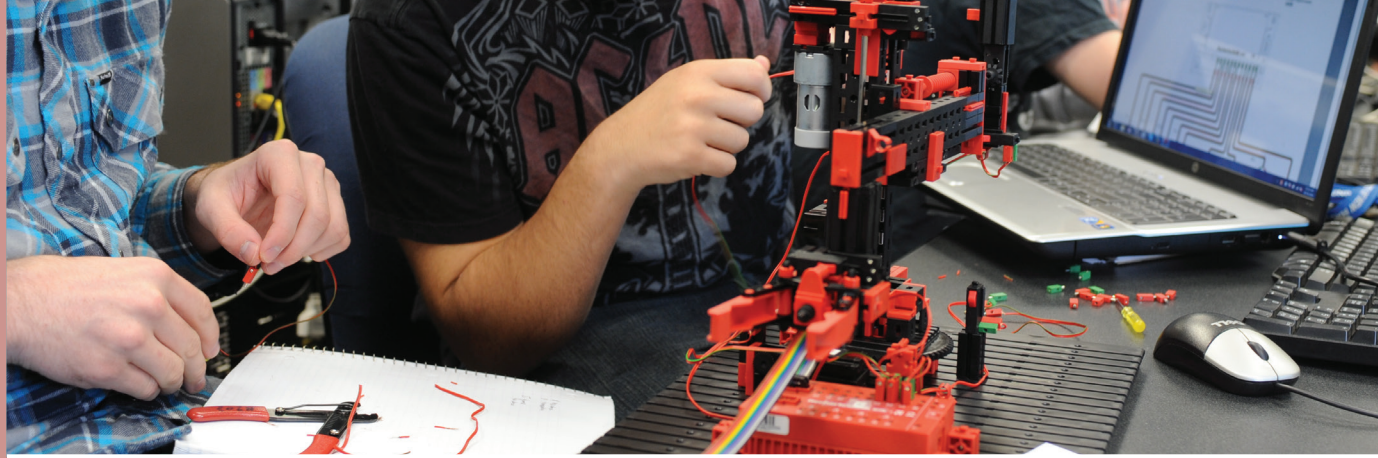
The Tagliatela College of Engineering is one of the few colleges in the country to give freshmen full access to its laboratories. Also, most classrooms are “smart,” — they’re equipped with cutting-edge multimedia technologies and computers. Many faculty members use the Blackboard system, allowing students to submit homework online, access Tegrity resources, and use the discussion board to communicate about course-related activities. Here’s where the action takes place:

- ▶ **State-of-the-Art Multiuse Laboratory for Industrial and System Engineering.** Fuses lecture, learning, practice, collaboration and computing zones. It features: a UPrint® 3D Printer to transform ideas into 3D models; NextEngine 3D Scanner which combines multiple optics arrays, dual three megapixel CMOS sensors and laser triangulation technology; and a broad array of the latest software programs including IBM DOORS, SysML, Matlab, Simulink, Labview, Arena, FICO Xpress Solver, Lindo, Lingo, and many others.
- ▶ **Thermo/Fluids Laboratory.** A fully equipped space that provides abundant opportunities for experiments and investigations in the areas of incompressible fluid mechanics, thermodynamics, heat transfer and gas dynamics. Experiments include open channel flow, closed pipe flow, drag and lift, refrigeration and air-conditioning, heat conduction and convection, potential flow, subsonic and supersonic wind tunnels, vapor-compression refrigeration and viscometry.
- ▶ **Chemistry Laboratories.**
 - **a General Chemistry Lab** that houses analytical balances and standard quantitative glassware for stoichiometry, pH meters, power supplies and voltmeters for electrochemistry, and fume hoods for the safe use of hazardous materials.

- **an Organic Chemistry Lab** with balances, melting point apparatus, two refractometers, a polarimeter, vacuum distillation equipment, and ventilation hoods for the use of hazardous materials.
- **a Physical Chemistry Lab** that includes facilities for vacuum techniques, compressed gas handling, and cryogenics with temperature, pressure and flow transducers interfaced to PCs and Verneir Labquest data collection devices for the study of gas properties. Specialized equipment includes a Phillips XRG 3100/PW1710 Diffractometer, uTA Microthermal Analyzer and Ocean Optics UV-Vis and Fluorescence spectrometers.
- **an Analytical Chemistry Lab and Chemical Instrumentation** which provides students with hands-on experience in three major areas of analytical chemistry: spectroscopy, chromatography (separations) and electrochemistry. Students analyze organic and organometallic compounds with a Shimadzu Fourier Transform infrared spectrophotometer, while forensic, environmental, and pharmaceutical samples are analyzed with our Shimadzu X-ray Fluorescence Spectrometer, Perkin-Elmer Atomic Absorption and UV-Visible spectrophotometers. Environmental and hydrocarbon mixtures are separated and identified using a Perkin-Elmer GC/MS system. A Shimadzu HPLC with UV and fluorescence detectors is used for analysis of pharmaceutical preparations and food products. Cyclic, linear sweep, differential and normal pulse voltammetry studies are performed using the Chin Instruments electrochemical analyzer.
- ▶ **Chemical Engineering Laboratories.** Equipment includes: a plate and frame filter system, fluids network, thermal conductivity apparatus, double pipe heat exchangers, shell and tube heat exchanger, double effect evaporator, bubble cap distillation column, packed tower gas absorption, continuous stirred tank reactor system, Bailey Lan 90 process control system, and tray drier.



- ▶ **Computer Science/Computer Engineering Lab.** Students work with Linux, Windows, and Macintosh OS-X systems.
- ▶ **Mechanics Laboratory.** Used for studying basic experimental techniques in the mechanics of materials and vibration of mechanical structures. Tension test, torsion test, stress analysis, shock testing, forced vibration analysis, mounting strain gages, and thin-wall pressure vessel are some of the experiments conducted here.
- ▶ **Manufacturing Laboratory and Machine Shop.** The space houses mechanical and civil engineering laboratories and supports student design projects and faculty research. University support and generous donations from New Haven Manufacturing, Pratt & Whitney, Allied Signal and other companies have made precision machining possible on a limited scale.
- ▶ **Steinhauser Study Center.** The Student Chapter of the ASME and the ASCE have their office here. The Center is also a conference room, study room, and lounge for mechanical and civil engineering students — and the scene of many brainstorming sessions. Networked computer terminals and reference books are within easy reach.



CYBER FORENSICS RESEARCH AND EDUCATION GROUP

As a component of undergraduate student research, this group houses a multidisciplinary team of students and world-renowned faculty that work on reconstructing digital evidence from digital devices (such as gaming devices like Xbox or Wii), mobile devices (iOS and Android phones), and hard drives. Our most recent project led to the discovery of privacy flaws in popular messaging apps. You can visit cyberforensics.newhaven.edu to learn more about the group's activities and their continual scientific contributions.

WIRELESS RESEARCH GROUP

This group also houses a team of students and world-renowned faculty that work on improving the state of the art in wireless networking. The group works with students and researchers all over the world to research the most current developments in wireless technologies such as next generation wireless, 4G, 5G, LTE advance, and wireless sensor networks. Please visit www.newhaven.edu/UNHwRG to learn more.

PITCH – PROJECT TO INTEGRATE TECHNICAL COMMUNICATION HABITS

With support from the Davis Educational Foundation, the Tagliatela College of Engineering has launched PITCH, designed to improve the technical communication skills of engineering graduates. Employers want engineering graduates to display the ability to clearly and effectively communicate. Unlike most other engineering universities, UNH offers this type of training in regular engineering courses. PITCH faculty members have developed a comprehensive set of outcomes based on surveys of alumni and employers. These surveys measured not only the technical communication skills that are critical in the profession but also the behaviors that are likely to drive success. We then incorporate these results into the curriculum, and all assignments are based on engineering content.

PROJECT LEAD THE WAY

Project Lead The Way (PLTW) is a national program that forms partnerships among public schools, higher education institutions, and the private sector to increase the quantity and quality of engineers and engineering technologists graduating from our education system. The program offers a hands-on, project-based approach to learning that better prepares students for the rigors of college. It incorporates science, technology skills, engineering, and math (STEM curriculum), all of which are needed for success. Currently, PLTW is offered in all 50 states and the District of Columbia. The University of New Haven is the affiliate university for PLTW in the state of Connecticut, providing teacher training, PLTW certification for Connecticut schools, college credit for students, graduate college credit, and professional development for teachers.

PROFESSIONAL STUDENT CLUBS

Students who participate in a variety of organizations enhance their resume and create memories that will last a lifetime. With over 170 clubs and organizations for our 4,400 full-time undergraduate students, the University of New Haven has one of the most active and engaged student bodies for a college of its size anywhere. Ranging from academic-based clubs and organizations to club sports to Greek life, there is truly something for everyone at UNH. In the Tagliatela College of Engineering alone, there are many successful student clubs and organizations, in addition to student chapters of professional engineering associations and honor societies. Here are some of our most popular:

- ▶ American Chemical Society (ACS)
- ▶ American Institute of Chemical Engineers (AIChE)
- ▶ American Society of Civil Engineers (ASCE)
- ▶ American Society of Mechanical Engineers (ASME)
- ▶ Automation Club
- ▶ Engineers Without Borders
- ▶ The Institute of Electrical and Electronic Engineers (IEEE)
- ▶ The Institute of Industrial Engineers (IIE)
- ▶ National Society of Black Engineers (NSBE)
- ▶ Pi Tau Sigma, an international Mechanical Engineering Honor Society
- ▶ Programming Club
- ▶ Robotics Club
- ▶ Society of Hispanic and Professional Engineers (SHPE)
- ▶ Society of Women Engineers



A MENTOR BY DESIGN.

TO DR. JEAN NOCITO-GOBEL, TEACHING IS ONLY PART OF HER VOCATION.

Professor Jean Nocito-Gobel teaches both undergraduate and graduate courses in the Civil and Environmental Engineering program. But she's more than an impartor of knowledge. In fact, she specifically chose a university that focuses on undergraduate education because it gives her more opportunities to interact with students. For her, advising and mentoring are a natural extension of teaching, and it's one she takes to heart.

Dr. Nocito-Gobel's résumé includes both professional and academic experience, so she can speak with authority when advising her students. After earning a B.S. in Civil Engineering from Manhattan College, an M.S. in Civil Engineering from The Ohio State University, and a Ph.D. in Environmental Engineering from the University of Massachusetts, Amherst, she spent three years working at the U.S. EPA Marine Research Lab in Narragansett, Rhode Island. There she helped develop models to simulate the transport and fate of contaminants in marine environments. She has taught at UNH since 1995.

Dr. Nocito-Gobel offers advice early in her students' college careers — and to their parents. "Not all students are going to succeed in the same learning environment. You need to find the right "fit" for your son or daughter. Gather information about schools, but, ultimately, let your student make the final decision, based on where he or she feels most comfortable."



MARIA-ISABEL CARNASCIALI, PH.D.

Dr. Maria-Isabel Carnasciali received her Ph.D. from Georgia Tech, specializing in the area of thermal-fluid sciences. It was during her time at M.I.T., where she received her B.S. in Engineering, that she developed a deep belief in the value and impact of undergraduate research. She carries this passion into the classroom and actively seeks to involve students in all aspects of research. She strongly believes that much of a student's learning takes place outside of the classroom — whether it's through working on projects, engaging in service learning activities, or participating in the multitude of clubs and activities available on campus. In addition to teaching and research, she devotes considerable energy to student events and activities that contribute to the overall undergraduate experience. She mentors students in the Engineering Living Learning Community and serves as faculty advisor to the student chapter of the Society of Women Engineers.



IBRAHIM BAGGILI, PH.D.

Dr. Ibrahim (Abe) Baggili is an assistant professor of computer science. He received his B.S., M.S., and Ph.D. degrees from Purdue University and has lived in a few different countries. Prior to coming to UNH, he was the Director of the Advanced Cyber Forensics Research Laboratory at Zayed University in the United Arab Emirates. Dr. Baggili has published and presented his research at international conferences with students. He continually encourages students to pursue entrepreneurial activities. Students in his cybersecurity and cyber forensics classes gain hands-on experience, learning the process of acquiring, authenticating, and analyzing digital evidence. Students are also encouraged to innovate by creating new methods and tools for the acquisition and analysis of digital evidence.



NANCY ORTINS SAVAGE, PH.D.

Professor Nancy Ortins Savage, an associate professor of chemistry, joined the University of New Haven in 2005. She teaches courses in the areas of analytical, physical, and materials chemistry. Dr. Savage believes that students learn best through participation, so she makes time during lecture periods for students to work on problem-solving activities, uses a classroom response system (commonly known as "clickers"), and encourages students to ask lots of questions. In addition, she has supervised numerous undergraduate research projects on topics such as chemical sensing, environmental analysis, and materials synthesis. Dr. Savage earned her B.S. from Rensselaer Polytechnic Institute and her Ph.D. from The Ohio State University. She also spent two years as a postdoctoral researcher at the National Institute of Standards and Technology.



DAVIDE DEJEAN

HOMETOWN

Orange, NJ

MAJOR

Chemical Engineering

CLASS

Senior

WHY DID YOU CHOOSE UNH?

The major reason I chose the University of New Haven was the amazing forensic science program. I also loved the size and location of the campus. The school isn't too small, yet it isn't a really big school. It's also not too far from home in North Jersey, New York City and Boston. I decided to change my major from forensic science to chemical engineering during my second semester of freshman year. At that point, I did look at other schools, but I ended up staying here at UNH because of how great the engineering program is. It's a smaller program, and the professors know who we are even outside of the classroom. We get hands-on experience and industry skills starting in our first-year courses. I'm very happy with my decision because I feel ready to take on my profession in the real world.

WHAT DO YOU LIKE MOST ABOUT THE UNIVERSITY OF NEW HAVEN?

It is hard to say what I like most about the University of New Haven, but one of my favorite things is the fact that it is so easy to get involved here. There are so many different clubs and organizations. I am the President of the National Society of Black Engineers and the First Vice President of the National Association for the Advancement of Colored People. I've been the Vice President of WRITE Poetry Club and

a member of the American Chemical Society and the American Institute of Chemical Engineers. RECSports is another great way to get involved. My team is SWAT Team, and we compete in all different types of intramural sports — basketball, volleyball, and handball, to name a few. I am also a student-athlete. Being part of the Track & Field team has only made my experience at UNH more enjoyable.

WHAT DO YOU FEEL YOU ARE GETTING OUT OF YOUR MAJOR?

As an engineering student here at UNH, I feel as though I am more prepared to succeed in the industry. Yes, we learn everything that is in the books, but we learn a lot more than that. I have professors who have worked their entire careers as chemical engineers or project managers, but they have also been teaching for many years. They know what the industry is like, so they know what we need to learn beyond the text. One major skill that I have picked up is learning how to work well in a group of engineers who may not all have the same background as I do. I've done projects with civil, mechanical, electrical, computer, and even system engineering majors, and it has taught me a lot about the importance of communication, precision, and accuracy.

WHAT INTERNSHIPS OR EXPERIENTIAL LEARNING OPPORTUNITIES HAVE YOU PARTICIPATED IN?

In the beginning of my junior year, I was able to do research at the Mason Laboratory of Yale University, which is only about 10 minutes from our campus. One of the professors there actually reached out to my professor for students in the chemical engineering program here that might be interested. I definitely have learned a lot through the experience. It is a lot different than a lab class, where you are given a procedure and you just record your results and interpret. We had to make our own procedure to measure the amount of soot given off by combusting different fuels. The learning experience was even more enjoyable because of this.

WHAT ARE YOUR PLANS FOR THE FUTURE?

I still am not exactly sure what I want to do, but I know that in the future I want to go into research of some sort because I am a good problem solver. I am currently applying for a Nuclear Reactor Engineering position in the NAVY. The benefits are endless, and it would prepare me extremely well for the direction that I am going with my major.



LAUREN PRIMOVIC

HOMETOWN

Avon, Connecticut

MAJOR

System Engineering

CLASS

Senior

HOW DID YOU BECOME AN ENGINEERING MAJOR?

Before coming to UNH, I had no idea what I wanted to be when I grew up. I considered studying Graphic Design, Business, Mathematics, Education, and even Criminal Justice. The list was endless and it was clear that I couldn't make a decision on what I wanted to do for the rest of my life.

I decided to come to UNH one day in the summer before my freshman year to talk to some professors about majors I may find interesting. Being new to the school and still unaware of my surroundings, a professor saw me wandering the halls of Buckman and took me to her office. Professor Thompson sat me down and talked to me about System Engineering and why she thought it would be the perfect match. After a 20-minute conversation, I was immediately convinced that this was the major for me. Studying engineering was initially never on my list, so I find it rather amazing that with one conversation and with one professor I was able to answer the big, "What do you want to do with your life?" question. I am currently a senior at UNH, and could not be happier about choosing to be a part of the engineering department.

WHAT DO YOU THINK IS THE GREATEST FEATURE ABOUT UNH?

One of the many great features I find at UNH is the campus size. The smaller size is such a convenience — I don't find myself walking 20 minutes to get from one building to the next. I think UNH's smaller size truly enhances the sense of community within the University. With a smaller size campus, there is also a smaller number of students that attend the University. I like that it is small enough that I find myself chatting or simply smiling at the people I know when walking around campus. But at the same time, it doesn't feel like I am back in high school because it's large enough that I will also see a new face around campus every day.

Being at a smaller university also has its advantages in the classroom. The smaller class sizes are a major benefit here. The classroom setting is very interactive and I am able to get the individual attention I need to fully understand my course material. My professors know me by my first and last name, and I am not identified by a mere number.

The student-teacher ratio is a huge benefit and allows students to get more individual attention to enhance their academic experience. Students are able to ask questions and go over problems

they don't understand in class, while professors always have office hours for extra help outside of class. The professors and advisors truly care about their students' success. I receive emails from my advisor regarding internships, company tours, informative seminars I may be interested in going to, or even just a check-up to know how I am doing. It makes the college transition and overall experience a much smoother process.

WHAT ARE YOUR PLANS FOR THE FUTURE?

My hopes are that after I graduate I can work for an engineering company in my field of study. I have learned a lot while at UNH, and I will continue to learn each and every day in hopes to apply these skills in the industry. Life is a journey, and I know UNH has prepared me for the long road ahead.

WHY DID YOU CHOOSE UNH?

I made my decision to come to this school based on 3 reasons; location, academics, and athletics.

I love the big city, and UNH is close to the train station if I want to take a trip into Manhattan. There is also a lot of great nightlife, restaurants, and shopping in the city of New Haven — UNH offers shuttle transportation to all these popular places. In addition, UNH is close enough to home, yet far enough away to still get the college experience.

Before I knew I wanted to study engineering, I chose a school that offered a lot of majors in case the one I initially chose wasn't right for me. There are a wide variety of majors and minors here, so graduating from UNH with a degree I was interested in was the least of my worries. And because of its location, the University has ample connections with major companies in the area for future internships. Also, UNH is very good in granting academic scholarships to their students. The academic scholarship I was granted made UNH a better financial decision compared to the other schools I was considering.

Lastly, athletics played a major role in my ultimate decision. I wanted to play Division II soccer and there is an excellent balance between academics and athletics here. UNH is in the most competitive DII conference in the nation so I knew I would be able to make the most of my athletic endeavors, while still obtaining a solid education. At UNH, I found that the athletic facilities, coaches, and athletes were exactly what I was looking for.



MICHAEL J. TORRE '08 – Mechanical Engineering, B.S.

I went to UNH to pursue a degree in mechanical engineering, and what I got was more than just an education, I got an experience that set the ground work for my career. Today I'm working on a master's degree in Supply Chain Management through GE. I currently work for GE, Aviation, and I tell people that I basically build jet engines for both military and civilian use. I started as a Co-Op back in October of 2007 and, before my three months were up, I was offered a full-time position (with reduced pay since I was only a senior without a bachelors degree). As soon as I got my BSME degree, I got my raise to full pay and continued to grow my career through increasing roles of responsibility throughout the company. I am currently involved with GE Aviation's Operations Management Leadership Program, which consists of moving and working in four different parts of the business for two years across the U.S., with hopes of joining their Corporate Audit Staff team. That will put me in six different countries over two to three years. Since joining GE, I have worked as a Manufacturing Engineer and Lead Engineer in Manchester, Connecticut; Revenue Share Participant Account Manager in West Chester, Ohio, 2nd Shift Supervisor for compressor blade machining in Rutland, Vermont, Project Engineer in Jacksonville, Florida, and Material Fulfillment in Santa Ana, California. I have had the joy of working on projects that have helped GE save thousands of dollars by putting my education from UNH to work. Some of these projects led me to become nominated for the Edison Engineering Award!

HOW DID UNH PREPARE YOU FOR LIFE AFTER COLLEGE?

The program at UNH did more than just give me an education; it prepared me for real world issues. A few of the classes required participation in the machine shop in order to manufacture what we needed for a particular project. This is a very unique attribute that I love about UNH — the students are encouraged to build what they design. In the real world you can have the best design, but if you can't build it, then what good is it? This type of hands-on learning is not seen in most other colleges, and it gives the students here at UNH the upper hand when job hunting. I never had the best grades during my undergrad years, but my mechanical background potential was fully developed here, which is one of the main reasons I was hired for my current position. The classes helped me learn how to treat a problem in a methodical way, while the hands on learning enabled me to put my ideas to work (like GE's motto "Imagination at Work").

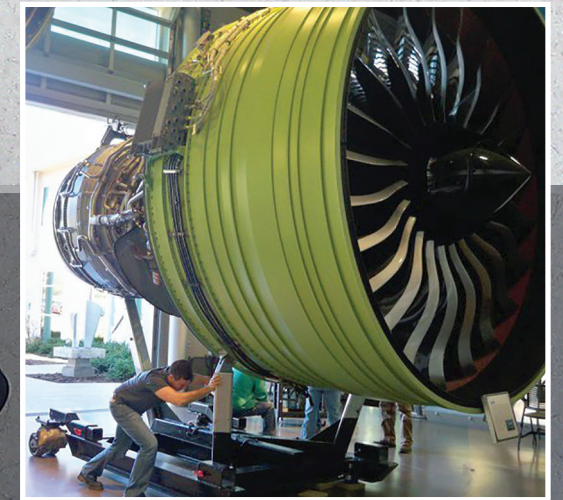
WHAT IS YOUR FAVORITE MEMORY ABOUT YOUR TIME AT UNH?

Some of my best memories are from freshman year, when I was pledging the Delta Chi Fraternity. Senior year was great because I finally made the Dean's List while working full-time, taking over 15 credits and being an active member in the Delta Chi Fraternity. The other years were great too, but freshman year was the best. Freshman year was exciting, as it is for most college kids. I was 18, and everyone was excited to meet new people from all different places. The world seemed so big at that point. I pledged the Delta Chi Fraternity that year because my roommate convinced me to try it out, and for someone who hated the idea of Greek life due to the image MTV creates of it, I have to admit it was a great time. While pledging with my 11 other pledge brothers (all different kinds of people), we learned a lot about how a brotherhood helps make all men one. We also took part in a lot of school and community events, helping out people in need in the local area and participating in blood drives, the Jimmy V fund, and more. The results of these events and seeing how our help meant a lot to the people who received our assistance is what made freshman year most memorable.

WHY UNH?

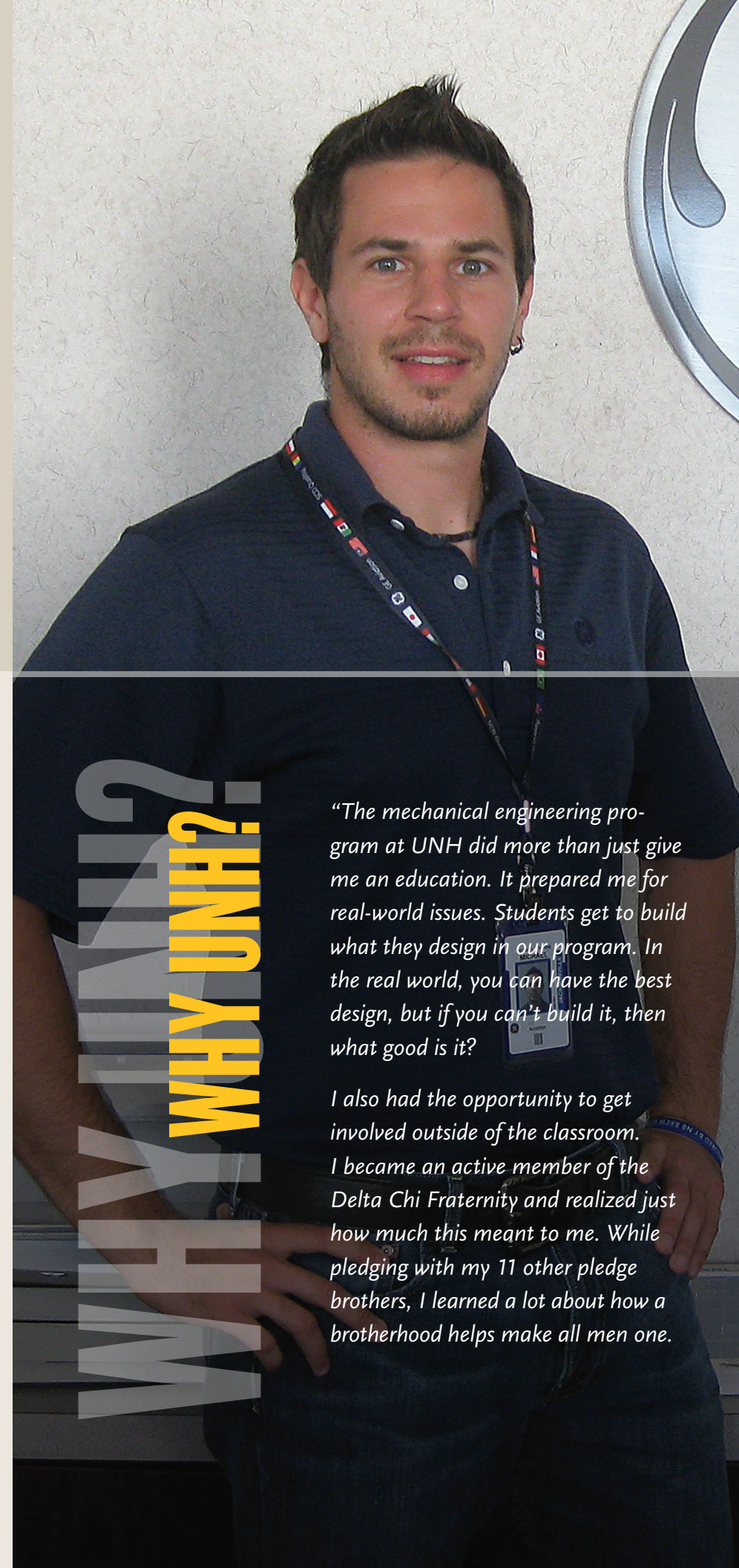
"The mechanical engineering program at UNH did more than just give me an education. It prepared me for real-world issues. Students get to build what they design in our program. In the real world, you can have the best design, but if you can't build it, then what good is it?"

I also had the opportunity to get involved outside of the classroom. I became an active member of the Delta Chi Fraternity and realized just how much this meant to me. While pledging with my 11 other pledge brothers, I learned a lot about how a brotherhood helps make all men one.



The experience at UNH is like no other. It's like a family, but be prepared to work and challenge yourself. If you choose to attend UNH, you will not be disappointed. We will help you succeed!"

– Michael J. Torre





MELODY SODERBERG (JOHNSON) '09

Chemical Engineering, B.S., Fire Protection Engineering, B.S.

I graduated from UNH in 2009 with a B.S. in Chemical Engineering and a B.S. in Fire Protection Engineering. Before graduation, I was hired as a Chemical Incident Investigator with the United States Chemical Safety and Hazard Investigation Board (CSB) in Washington D.C. and moved to the D.C. metro area. With the CSB, I have travelled to industrial chemical accidents around the country, where we investigate and determine the root cause of the incident. We produce a report to inform the general public and make recommendations to organizations in the industry and regulatory agencies so that they can work to prevent a similar incident from occurring in the future.

HOW DID UNH PREPARE YOU FOR LIFE AFTER COLLEGE?

At UNH, I was able to take classes in many areas of study and customize my degrees to learn as much as I could about chemical safety and hazards analysis. It gave me the great basics I needed to walk onto any job site. Before walking onto a job site, we know only the basics about the incident. We have to become experts about that incident before we write our report. I am always learning, and the professors at UNH are the ones who stimulated my passion for learning. Now, I want to know every detail and every side of the story, which makes me the investigator I am today.

Each case we investigate is in a different area of the country, with a different company that has a different chemical process and safety culture.

I am required to multitask in order to work on several cases at the same time. Throughout my four years at UNH, I got better at multitasking and time management by getting involved in many activities while still studying for my engineering degrees. I loved having my hands in everything on campus, which now has given me the tools to successfully analyze several open investigations.

The community at UNH is well-rounded — with academics, athletes, student leaders, and musicians. I was given the opportunity to be an engineer, student government leader, researcher, and dancer. UNH not only prepared me for my career and field of study, but it also prepared me for life.

WHAT ARE SOME OF YOUR FAVORITE MEMORIES ABOUT YOUR TIME AT UNH?

I have so many memories as a dancer and choreographer with the 5-6-7-8 dance team. Weekly rehearsals with the girls were my escape from my studies for a couple hours. At ISA's International Fest, I performed Irish step dance for the first time in my life as a dancer. If it hadn't been for UNH, I wouldn't know how to dance a slip jig.

As a member of the USGA executive board, I was able to work with the students and improve campus activities. Our weekly meetings were full of lively discussions among all student leaders. I collaborated with many motivated colleagues who have remained my closest friends.

I became a different person the summer after my freshman year when I fully transitioned from high school to college. That was the summer that I met my husband, Carl. He brought me to my first student government meeting and encouraged me to take advantage of everything the UNH community could offer me. I can't thank him enough for motivating me to take the initiative — to do what I want without waiting for it to come to me. Only I could be the one to make my college experience amazing!

WOULD YOU CHANGE ANYTHING ABOUT YOUR EXPERIENCE AT UNH?

If I were given the chance to relive my four years of college, I would have pushed my boundaries just a little bit more. College became a comfort zone, and I loved every minute, but I didn't take advantage of enough of the opportunities off campus. I should have signed up for more professional conferences to learn about the process safety industry, attended more off campus activities, enjoyed New Haven nightlife, and driven to the beach a few more times. I certainly made the most of my four years of college on the UNH campus, but I didn't need to wait until graduation to see the world outside.

WHAT ADVICE WOULD YOU GIVE PROSPECTIVE STUDENTS AND THEIR FAMILIES?

Find a school where you feel as though you fit in. The transition from high school to college was difficult for most of us for one reason or another. So, the more comfortable you feel on your first day, the easier it will be to focus on your classes and work towards finding your niche. If you only choose a school for one specific reason, and think that you will change yourself to fit in everywhere else, you are making the hardest part of college even harder.





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