UNDERGRADUATE

COMPUTER SCIENCE PROGRAMS

B.S. COMPUTER SCIENCE

B.S. INFORMATION TECHNOLOGY
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.

The College has a special focus on the development of professional skills that are important in today’s workplace. The “Project to Integrate Technical Communication Habits” develops students’ written, oral, and visual communication skills across four years in all engineering and computer science programs. Entrepreneurial thinking that allows students to develop customer awareness, business acumen, and an understanding of societal values is also integrated into courses.

The computer science program offers leading-edge coursework and research in cyber forensics and wireless networking that are flagship initiatives of the College.

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
The University of New Haven’s Department of Electrical & Computer Engineering and Computer Science is one of the largest in the Tagliatela College of Engineering (TCoE) and offers undergraduate degrees in four disciplines and master’s degrees in three of these fields. These disciplines include computer engineering, computer science, and electrical engineering and information technology. In addition, we are the trend makers in the field of digital forensics and cyber crimes.

Our educational philosophy is to prepare students from diverse backgrounds for professional practice and continued growth in the fields of electrical engineering, computer engineering, computer science, and cyber systems. We provide students with the skills and background they need to become proficient in today’s technology and to keep abreast of future developments in these fields after they graduate. Our current research areas include electric power and renewable energy, wireless communications, cyber systems, big data, and cloud computing.

An important feature of our programs is putting theory into practice. Through a mixture of specific lab courses and in-class projects, students engage in “hands-on” experiences that further emphasize the lessons they have learned. In their junior year, all students are required to complete an internship. These activities culminate in an industry-sponsored design project in senior year. Experiential learning is augmented by our study abroad program in Prato, Italy. Most of our students elect to take on this experience in their freshman year — the time that best fits our academic programs.

Being true to the broader educational missions of the University and the TCoE, the programs in our department possess many facets. Through the University’s core requirements, students expand their cultural and intellectual horizons by exposure to the humanities and social sciences in addition to the technical aspects of mathematics and science. Written and oral communication skills are developed repeatedly throughout the curriculum. Teamwork also plays an important role in many classes.

I invite you to learn more about our programs and to visit us, get to know us better and see the exciting world of opportunities that the Tagliatela College of Engineering can open up for you.

Best wishes,

Ali Golbazi, Ph.D.
Chair, Department of Electrical & Computer Engineering and Computer Science

“An important feature of our programs is putting theory into practice. Through a mixture of specific lab courses and in-class projects, students engage in “hands-on” experiences that further emphasize the lessons they have learned.”
William Adams, Ph.D., Associate Professor
Dr. Adams has taught at both the undergraduate and graduate levels. His research interests include image processing, software engineering/development, and human-computer interaction. He also leads the Freshman Engineering Study Abroad Cohort in Prato, Italy and teaches the engineering courses there.

Ibrahim Baggili, Ph.D., Assistant Professor
Dr. Baggili specializes in cyber forensics and security and is head of UNH’s Cyber Forensics Research and Education Group. He is the former director of the Advanced Cyber Forensics Research Laboratory in the College of Technological Innovation at Zayed University, Abu Dhabi, UAE. In addition, he is a former researcher at both the Center for Education and Research in Information Assurance and Security and the Cyber Forensics Laboratory at Purdue University. He has worked closely with law enforcement.

Dr. Baggili has spoken at conferences worldwide and has published extensively in the area of digital forensics. He is also Editor-in-Chief of the Journal of Digital Forensics, Security and Law. His work has been featured in media outlets worldwide, such as CNET and The Huffington Post.

Alice Fischer, Ph.D., Professor
Dr. Fischer’s research interests focus on software development and language theory. Teaching at both the undergraduate and graduate levels, she is also Advisor for the Computer Science B.S. and A.S. programs.

Amir Esmailpour, Ph.D., Assistant Professor
While teaching undergraduate and graduate computer and networking courses, Dr. Esmailpour conducts research on the 4th Generation (4G) of wireless networks such as Long Term Evolution (LTE) and Worldwide Interoperability for Microwave Access (WiMAX). He has had years of experience in industry, working for companies such as Nortel Networks and Daimler Chrysler. He is head of UNH’s Wireless Research Group, which conducts state-of-the-art research in different areas of wireless communication and wireless networking.

Frank Breitinger, Ph.D., Assistant Professor
A recent addition to our computer science/information technology faculty, Dr. Breitinger brings a strong cybersecurity background to UNH, having received his doctorate at the Technical University Darmstadt and Center for Advanced Security Research Darmstadt in Germany. In addition to teaching, he will be heavily involved in the work of the University’s Cyber Forensics Research and Education Group where he will continue his research in cybersecurity, hash functions, and approximate matching.

Dr. Breitinger has spoken at conferences worldwide and is highly published in digital forensics. He has led the writing of the NIST definition document on approximate matching.

David Eggert, Ph.D. Associate Professor
Teaching at both the undergraduate and graduate levels, Dr. Eggert’s courses focus heavily on programming, including C programming, systems programming, and script programming for network administration. His research interests are in the areas of robotics and computer vision. He is Advisor for the Information Technology B.S.
To start making a contribution from day one of your first job after graduation, you need to be skilled at using the equipment you will find there. The laboratories where you will spend a great deal of your time in our programs are training grounds for the real job world. Stocked with the same cutting-edge technology found in companies and government entities, large and small, across the globe, they enable the hands-on experience and proficiency that impress prospective employers.

The laboratories in which you will develop this highly prized expertise include:

- **Cyber Forensics Research & Education Laboratory (CFREL)**, housing equipment and software that both industry and government agencies routinely make use of. The Group is also building its own technologies to aid in cyber criminal investigations. Some of the lab’s capabilities include: hardware write blockers, forensic imagers, FED Touch Ultimate and XRY for mobile forensics, and a variety of open-source and closed-source software tools such as Autopsy, Bulk_extractor, FTK Imager, and EnCase.

- **The Instrumentation Laboratory**, which gives students and researchers access to state-of-the-art data acquisition hardware and software.

- **The Computer Engineering Laboratory**, where microprocessor courses currently based on the Motorola 68000 unit are active. Current PC systems running various software tools enable the student to compose, debug and implement coding on these devices.

- **The Networking Laboratory**, which includes three racks populated with wired and wireless equipment that allows students to login to the devices and perform various laboratory exercises on wired and wireless network technologies. All of the devices are connected to access servers, so students can login to the devices and perform their labs remotely from anywhere on the campus or from home. On the wired side, there are several Cisco routers and switches, both on the enterprise as well as service provider (ISP) gears, including the Cisco 2500 and 2600 series of routers and the 2900 and 3500 series of switches. Higher-end routers and switches such as the 3900 and 6500 series will be added in the near future. On the wireless side, the lab houses several stand-alone, Cisco enterprise-gear 1200 series Access Points (AP) and 3500 series Light Weight APs as well as several 2100 and 4400 series Cisco wireless LAN controllers. The racks are also equipped with two super-power Dell PowerEdge R710 servers for virtualization and cloud computing labs.

- **The Power Systems Laboratory**, containing all the software and hardware needed to engage students in the design and simulation of load flow analysis, and to reinforce concepts from power electronics, and motor drives.

- **The Computer Science Laboratory**, where almost all software development projects take place. A mixture of Dell and Apple computers provides a variety of operating systems that students will be exposed to in their classes, including Windows, Mac OS X, and Linux. A variety of IDEs are available as well as any specialized software, such as network simulators or mobile application SDKs, needed for a particular class.

- **The Digital Signal Processing Laboratory**, which serves the dual purpose of engaging students in research work in various areas of DSP through algorithm development and implementation while giving them experience in the relevant skills sought by industrial employers in this field. In the DSP Laboratory, students acquire skills in the real-time implementation of DSP algorithms on the Texas Instruments TMS320C6747 floating point DSP. Programming of the DSP chip is carried out in C using the Code Composer-Studio (CCS) integrated development environment.
If you’re adept at solving problems, computer science may be for you. If you’re a whiz at abstract thinking, computer science may be for you. Good at designing things? Again, computer science may be the perfect fit. But, what if you’re good in all three of these areas? Well, then, there’s no maybe about it. Computer science is definitely your calling.

In brief, computer science is the science of using computers to solve problems. A lot of that problem-solving involves designing the software that goes into computer hardware, so programming is an essential part of computer science. Programming is only part of the equation, though. With our bachelor’s program in computer science, you’ll get a thorough education in all of the elements that make up this restless and dynamic field — a field that is always envisioning, and then creating, “the next big thing.”

By the time you graduate with your B.S., you’ll have an impressive skill set that includes the ability to:

- Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- Apply design and development principles in the construction of software systems of varying complexities
- Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems — in a way which demonstrates comprehension of the trade-offs involved in design choices
- Draw on a substantial body of knowledge and understanding of computer hardware, software and theory, as defined by the Association of Computing Machinery (ACM) curriculum guidelines
- Function effectively on a team to accomplish a common goal
- Communicate effectively with a range of audiences

Can’t wait four years to enter the job market? Go for the two-year associate’s degree and, while you’re working, complete the bachelor’s. Either way, you’ll be in demand: every state-wide and national list of “hot jobs” lists three or more computer science jobs in the top ten.
Courses for the B.S. in Computer Science include the University core requirements, plus the following:

## REQUIRED COURSES

### Freshman Year
- **CSCI 1110** Introduction to C Programming
- **CSCI 1166** Discrete Mathematics for Computing
- **CSCI 2210** Java Programming
- **EAS 107P** Intro to Engineering — Project-Based
- **ENGL 1105** Composition
- **ENGL 1110** Composition and Literature
- **HIST 1101** Foundations of the Western World
- **OR**
  - **HIST 1102** The Western World in Modern Times
- **MATH 1117** Calculus I
- **MATH 1118** Calculus II
- Plus one Social Interaction core elective (3)

### Sophomore Year
- **CSCI 2212** Intermediate C Programming
- **CSCI 2214** Computer Organization
- **CSCI 2215** Introduction to Databases
- **CSCI 2216** Computer Organization Lab
- **CSCI 2226** Data Structures and Algorithms
- **EASC 1109** Project Planning and Development
- **ELEC 1155** Digital Systems I
- **MATH 2203** Calculus III
- Two semesters of a laboratory science
- One Aesthetic Responsiveness core elective
- One Global Perspective core elective

### Junior Year
- **CSCI 3347** Network Essentials and Technologies
- **CSCI 3320** Operating Systems
- **CSCI 3326** Data Structures and Algorithms
- **CSCI 3398** Computer Science Internship
- **ENGL 2220** Writing for Business and Industry
- **OR**
  - **ENGL 2225** Technical Writing and Presentation
- **ENGL 3300** Writing Proficiency Examination
- **EAS Project Management and Engineering Economics**
- **EASC 3345** Applied Engineering Statistics
- One Citizenship core elective
- One Math/Science elective elective

### Senior Year
- **CSCI 3316** Social & Professional Issues in Computing
- **CSCI 4497** Software Project Analysis and Design
- Project elective:
  - **CSCI 4441** Web Database Application Development
  - **OR**
  - **CSCI 4526** C++/Object Oriented Principles & Practices
- Security elective:
  - **CSCI 4446** Introduction to Computer Security
  - **OR**
  - **CSCI 4534** Cryptography and Data Security
- **CSCI 4498** Senior Software Project
- **CSCI 4536** Structure of Programming Languages
- **CSCI 4547** Systems Programming
- Two Computer Science Senior electives
- One general elective
- Plus two senior-level computer science electives, one technical elective, one technical or specialization elective, one specialization elective, and one Global Perspective core elective

In addition, or as part of the preceding requirements, each student must complete a substantial individual programming project and a team project.
Fourteen billion years ago, an event known as the Big Bang occurred, and the physical universe has been expanding ever since.

But there’s been another big bang — a more recent one — in another universe. This big bang? The birth of the Internet in the 1960s. The universe? The information universe, with five trillion megabytes of data on the Internet and no plans to control itself.

Who manages all that information? They go by the names of network technician, applications developer, network security technician, and — at a higher level — network administrator and security manager. These are people who are vital to every business, industry, and government agency because if systems and programs don’t run smoothly, nothing in the organization does.

Our bachelor’s program in information technology program prepares you for these crucial positions in several key ways:

► It gives you a solid understanding of both practical and conceptual information technologies.

► It gives you a firm sense of the ins and outs of computer hardware, software, and design issues.

► It teaches you how to design effective and usable IT-based solutions and integrate them into a user’s environment.

► It teaches you how to design and implement a system for a real application, either individually or as part of a team.

Trying to decide between computer science and information technology? Here’s the main difference: computer science focuses on software design and development, while information technology concentrates on managing the infrastructure and making those developments accessible to people and organizations.

*NOTE: Pending state approval, we anticipate that the name of our Information Technology degree will be changing to Cyber Systems for the fall of 2015.*
Students must complete one of two tracks: web and database development or network administration and security. Courses for the B.S. in Information Technology include the University core requirements, plus the following:

**REQUIRED COURSES**

### Freshman Year
- CSCI 1110 Introduction to C Programming
- CSCI 1166 Discrete Mathematics for Computing
- CSCI 2210 Java Programming
- ENGL 1105 Composition
- ENGL 1110 Composition and Literature
- EAS 107P Intro to Engineering — Project-Based
- ECON 1133 Principles of Economics I
  OR
  ECON 1134 Principles of Economics II
- HIST 1101 Foundations of the Western World
  OR
  HIST 1102 The Western World in Modern Times
- MATH 1115 Pre-Calculus
  Plus one Aesthetic Responsiveness core elective

### Sophomore Year
- CSCI 2214 Computer Organization
- CSCI 2215 Introduction to Databases
- CSCI 3350 Human Computer Interact/ VIS Programming
- COMM 1100 Human Communication
- EASC 1109 Project Planning and Development
- EASC 2232 Project Management & Engineering Economics
- MATH 2228 Elementary Statistics
  Plus one Laboratory Science core elective, and one Social Interaction core elective

**WEB AND DATABASE DEVELOPMENT TRACK**
- CSCI 2226 Data Structures and Algorithms

**NETWORK ADMINISTRATION AND SECURITY TRACK**
- CSCI 3347 Network Essentials and Technologies

### Junior Year
- CSCI 3320 Operating Systems
- CSCI 3398 Computer Science Internship
- ENGL 2220 Writing for Business and Industry
  OR
  ENGL 2225 Technical Writing and Presentation
- ENGL 3300 Writing Proficiency Examination
  Plus one Business restricted elective, one Citizenship core elective, two specialization electives, and one Global Perspective core elective

**WEB AND DATABASE DEVELOPMENT TRACK**
- CSCI 3347 Network Essentials and Technologies
- DGAD 1101 Introduction to Multimedia
- GRDE 2212 Website Creation

**NETWORK ADMINISTRATION AND SECURITY TRACK**
- CSCI 4445 Network Administration
  CSCI 4472 Script Programming Network Admin
  Plus one technical elective

### Senior Year
- CSCI 3316 Social & Professional Issues in Computing
- CSCI 4497 Software Project Analysis and Design
  OR
  CSCI 4498 Senior Software Project
- INDE 4414 Engineering Management
  Plus one Global Perspective core elective, two specialization electives, and one technical elective

**WEB AND DATABASE DEVELOPMENT TRACK**
- CSCI 4441 Web Database Application Devel
- CSCI 4524 Advanced Databases
  Plus one technical elective

**NETWORK ADMINISTRATION AND SECURITY TRACK**
- CSCI 4446 Introduction to Computer Security
  Plus two CJ or CS restricted electives
Wired or wireless, a computer can either be friend or foe, depending on who you are. For crime victims and digital forensic investigators, the device is an ally that can produce valuable evidence to be used in court. For criminals, however, their own computer can turn on them and become a hostile witness for the prosecution.

There’s a wealth of evidence just waiting to be discovered on computers, there’s a growing body of specialists who know how to do the discovering, and there’s a special focus on it at UNH to help you become one of those specialists.

Through a major in either Computer Science or Information Technology, tailored through your electives to focus on your interests, you will learn about a field of discovery that 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 areas related to these studies? Think: cyber forensics, cybersecurity, and wireless networking.

As for the employment outlook, it’s rosy. In fact, 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 they even finish their degree.

HOW WE HELP YOU CREATE A PATH TO A CAREER IN THESE FIELDS:

- We are the first college in Connecticut to establish an Educational Partnership Agreement (EPA) with the Defense Cyber Crime Center (DC3). For further information, visit: [www.newhaven.edu/DC3Partnership](http://www.newhaven.edu/DC3Partnership)

- We have a highly respected international reputation. Our Cyber Forensics Research and Education Laboratory (UNHcFREG) discovered and publicized the security flaws in WhatsApp and Viber, reported in 20 languages across the world. Visit: [www.newhaven.edu/ViberFlaws](http://www.newhaven.edu/ViberFlaws)

- We have the only cyber forensics laboratory in the Northeast in digital forensic education. Our equipment is being used by industry as well as government agencies.

- UNHcFREG was invited to join the Academic Alliance for the Department of Homeland Security’s “Stop. Think. Connect” campaign.

- Our internships are as real-world as it gets. We place students in the heart of the cyber forensics/cyber security field at sites such as MITRE (working at the Department of Defense Cyber Crime Laboratory), Sikorsky Credit Union, and Yale-New Haven Hospital IT Security. The hands-on experience in our program is unparalleled.

- We have ongoing working relationships with the U.S. Air Force and law enforcement agencies on cyber crime cases.
Frank Breitinger

How long have you taught at UNH, and what courses do you teach?
I started at the University in September of 2014, so this is my first year here. Currently, I teach:

CSCI 6646 Introduction to Computer Security
CSCI 4497 Software Project Analysis & Design

Prior to coming to UNH, I studied at the Mannheim University of Applied Sciences in Germany, the University of Maryland, and the University of Applied Sciences Darmstadt (Germany), where I pursued my interest in cybersecurity. I earned my Ph.D. at the Technical University Darmstadt and the Center for Advanced Research Darmstadt.

What is your academic passion?
Overall, I am interested in every kind of research in computer sciences that involves my special focus in cybersecurity and digital forensics. With respect to UNH, I am looking forward to supporting UNHcFREG (University of New Haven Cyber Forensics Research & Education Group) and increasing its visibility.

How would you describe your role as an advisor and mentor?
My main role is to ensure that when my students graduate, they have what all computer science students should have — a good knowledge of mathematics, algorithms, and programming. It’s also important to teach them how to work independently and develop their problem-solving skills — in other words to challenge them and encourage an interest in research. In the area of personal skills, I try to train my students to have good communication and teamwork skills which are absolutely essential nowadays.

What are some fun facts about you?
Since I am a German, I like to wear my Lederhosen and have an ice-cold beer in a beer garden. During the (Cologne) carnival, I once dressed up as a grandma. A lot of people were surprised when I walked into the men’s restroom!

What advice would you give to prospective students and their parents?
When it comes to higher education, your decision should not be about if you are going to study, but what you are going to study. (Of course, I highly recommend computer science at UNH!) A good education is the cornerstone of every career.

What is your favorite thing about the University of New Haven?
I like that it is a small, rising university that is oriented toward the real-world practice of what is learned in the classroom. I also am impressed with how UNH cooperates closely with industry and engages in common projects with various companies.

How do the University of New Haven’s computer science and information technology programs differ from those of other reputable colleges and universities?
The main difference is that UNH is very open-minded. If someone has an idea, he or she will be encouraged to develop it. Also, due to its smaller size, there are fewer layers in the various hierarchies, which allows quicker decisions.
How long have you taught at UNH, and what courses do you teach?
I have been teaching at UNH for the past three years. I teach computer science and IT courses, mainly networking and wireless technologies. Some of the courses I teach are:

- CSCI 2247 Network Essentials and Technologies
- CSCI 4450 Network Design
- CSCI 6610 Intermediate Programming/C
- CSCI 6671B Wireless Technologies
- CSCI 6671C Enterprise Network Administration/Windows server

What is your academic passion?
Research, especially for graduate students. It is an important part of their education.

How would you describe your role as an advisor and mentor?
We are in a university environment and, as an advisor, my first job is to teach students the difference between a university and high school. In high school, students are given some material and questions that they have to read and understand. In a university environment, students need to learn how to research, investigate, analyze, explore, comprehend, design, implement, test, report, and present their work. Once they understand these concepts, then I can teach them and tell them how to find answers, what courses they should take to reach their goals, how to organize their program of study, how to manage their time, and how to work hard to succeed.

What are some fun facts about you?
I try to make the classroom a fun environment by making jokes, getting students involved, and finding real-life examples that reflect the course material. With my research students (project or thesis), we go out for lunch or coffee sometimes and occasionally do something active outdoors, like hiking or soccer.

What advice would you give to prospective students and their parents?
Talk to people in your field, including professors, students, and professionals, as much as possible and know what you are getting into very clearly and what your outcome will be. It is better to spend some time on it now, rather than finding out that this is not what you thought it would be after spending two years of your life on it. The good thing about UNH is that you can switch from one department to the other and use the credits you earned. Also, be ready — a university can sometimes be overwhelming, so make sure you start strong.

What is your favorite thing about the University of New Haven?
I'm very impressed with the experiential learning aspect here. It truly has a tremendous impact. Students learn so much through hands-on work that by the time they graduate, they are ready to join the workforce and be productive quickly. However, keep in mind that it requires hard work. Just taking and passing courses does not cut it anymore in our field.

How do the University of New Haven’s computer science and information technology programs differ from those of other reputable colleges and universities?
Again, it’s the hands-on work that students get — right from day one.
**Why did you choose UNH?**
I chose UNH because the University’s campus is compact and easy to navigate. Also, as a student-athlete, I found UNH to be an ideal environment to grow intellectually, both on and off the field.

**What do you like most about UNH?**
What I love about UNH the most is how passionate the professors are about teaching and how deeply they care about their students. I also have incredible access to my professors, which allows me to get to know them. This has allowed me to improve my academic performance.

Also, one of UNH’s greatest features is the number of the activities that are offered for students. From club sports to educational clubs and organizations, UNH offers tons of opportunities for students to interact socially and explore different career options.

**What extracurricular clubs and organizations are you involved in?**
I am a member of the University’s football team, and I am also President of the Gamma Alpha Tau chapter of Phi Beta Sigma Fraternity, Inc.

**What are your plans for the future?**
I have interned at the Port Authority of New York and New Jersey, Fleetgistics, and Sikorsky Financial Credit Union. Through these internships, I was able to experience the career that, I hope, is in my near future. I have found my internships both educational and useful in helping me chart a course for future career choices. I would like to work in cybersecurity or cyber forensics in the future.

**What is your favorite UNH tradition?**
During finals week, the administration serves a Midnight Breakfast to students. This event marks the beginning of exam week and creates an unbelievable bond between students. It is also a way for everyone to provide and receive support during a stressful time.

**What do you feel you are getting out of your major?**
The course load here is definitely preparing me for the transition into the work force. Also, it’s astounding to have the opportunity to conduct research in the UNH Cyber Forensics Research & Education Group under the guidance of Dr. Baggili, who has over 180 citations and is the editor-in-chief of the Journal of Digital Forensics, Security, and Law. We are dedicated to finding new methods of forensically investigating vulnerabilities in the latest technology.

**Do you have any advice for students and families interested in UNH?**
UNH’s computer science and information technology programs are two of the premier programs of the University. You will be challenged with assignments and a heavy workload; however, it will help you develop the skills necessary in your career of choice.
Why did you choose UNH?
This may seem like an unusual response, but I chose UNH mainly because of its presentation. From the design of the brochures, to restaurants, to logos, to building architecture, I was really impressed with the culture of UNH. Also, I got along really well with my advisor, Dr. Fischer, and was excited about the classes being offered.

What do you like most about UNH?
What I like most about UNH are the events. For instance, the College of Engineering has The Alvine Engineering Professional Effectiveness and Enrichment Program, which features a presentation every month from someone in the engineering community. It’s fun to hear someone talk about his or her passions and pitfalls and apply these lessons to my own life.

What extracurricular clubs and organizations are you involved in?
I am a member of the UNH Cyber Forensics Research and Education Group, where I’ve been doing research on smartphone applications and cloud storage security. I am also involved with WNHU, the campus radio station. I’ve been a student manager and DJ since I was a sophomore. I’m also a member of the Student Pagans Educating, Leading, and Learning Organization and the Paranormal Investigators Research Organization.

What are your plans for the future?
I plan to continue my education at UNH by going to grad school for Information Technology with a concentration in Digital Forensics/Information Security. I have been working alongside Dr. Baggili, a Digital Forensics professor here at UNH, on a research paper titled “Analyzing the Lack of Online Security Awareness in College Students.” I am hoping to complete it as my thesis paper.

What is your favorite UNH tradition?
My favorite UNH tradition is, without a doubt, the football games. It’s a unique experience for me because I’m in the parking lot for most of the games, DJ-ing for WNHU to the tailgaters. There’s always a lot of food and excitement. The homecoming game is an especially great time.

What do you feel you are getting out of your major?
I feel that I am getting the ultimate preparation to become a member of the business community. As an Information Technology major and aspiring entrepreneur, I am acquiring the necessary skill set to accomplish my dreams. This major has given me the drive and vision to see what I want and not be afraid to grab it.

Do you have any advice for students and families interested in UNH?
As a senior going into my last year here at UNH, I have reflected on my time here. I have had so many passionate teachers, gained so many caring friends, and learned so much. I wouldn’t be where I am today without the guidance and support of all the wonderful people I’ve met here. So, my advice to those interested in UNH is to go for it. This school will surpass your expectations, and you’ll easily find a club or organization that fits your interests, with people that fit your personality.
Why did you choose UNH?
I chose to transfer to UNH for three reasons: the resources that are offered for my career field, the well-recognized programs, and the many activities existing on campus. Every year, the Career Development Center puts on a career fair just for the College of Engineering. It gives me the opportunity to network with different employers and find out what they are looking for. This was a dealmaker for me because the University I attended previously didn’t have opportunities like that.

What was the hardest part about making the transition from high school to college?
The hardest part of transitioning from high school to college was that I had to adjust to the workload. In high school, you see your friends, but it’s limited each day, and when you get home you focus on schoolwork. At UNH, you make so many friends. You live near them, go to class with them, eat with them, and study with them. The toughest thing about transitioning to college is realizing that there is a time and place for everything and sticking to it.

What do you like most about UNH?
In my opinion, UNH’s greatest feature is the number of the activities that are offered for students. From club sports to educational clubs and organizations, UNH offers tons of opportunities for students to interact socially and explore different career options.

What extracurricular clubs and organizations are you involved in?
Currently, I am member of the Black Student Union, a game development club called Supernova, and the bowling club, which I joined recently. Supernova started last summer when one of my friends decided to create a club where we could create our own video games. Although the club is mainly made up of computer science students, we invite everyone who shares our passion for playing and creating video games.

What are your plans for the future?
After graduating from UNH, I plan to get my master’s in cyber forensics and become a Security Software Developer. As I get deeper into my studies here at this university, I have a better understanding of where I would like to be. When I was a freshman, I knew that I wanted to do something in the technology field. As a Security Software Developer, I would develop security software that includes tools for monitoring, traffic analysis, intrusion detection, anti-virus software, and more. I would also integrate and implement security into applications software.

What is your favorite UNH tradition?
My favorite UNH traditions are Midnight Madness and Welcome Week. I like Midnight Madness because it’s a showcase for our basketball team. The atmosphere is great and the school is pumped up for the upcoming season. They also have mini-games for students to participate in for prizes. Also, I like Welcome Week because it helps students adjust to the University and sets a good tone for the academic year. It’s a week of games in the quad, events during the day, and a block party to top it all off.

What do you feel you are getting out of your major?
I feel that my major is training me for the workforce. All of my professors are excellent and have been where I want to go. The personal experiences that my professors have had — and that some are still having — bring something unique to the classroom. It adds credibility and helps train me for possible adversities I could face in the workplace.

Do you have any advice for students and families interested in UNH?
Come and visit! UNH has taught me never to judge a book by its cover. In order to have the full college experience, you must have an open mind to new opportunities and experiences. Even after enrollment and throughout life, continue to have an open mind.

The New Hampshire Student Profile is designed to highlight the experiences of students at UNH. Each profile offers insight into a student’s journey and their perspective on their time at the University. This section features a student from the Computer Science major, who shares their reasons for choosing UNH, their experiences with extracurricular activities, future plans, and advice for prospective students and families. The profile also includes information on the student’s major, class, and hometown.
**Why did you choose UNH?**

I chose UNH for its small size and its strategic location at the center of the tri-state area. You get good exposure, which enhances your knowledge and broadens your outlook.

**What do you like most about UNH? Or, in your opinion, what is the greatest feature of UNH?**

To me, the friendly people, good faculty, and having the best labs are some of the great features of UNH. Students also have lots of scope for extracurricular activities.

**What are your plans for the future?**

I plan to pursue a career in information technology. I feel very fortunate that UNH has enriched me with the deep insight and knowledge of software skills that will definitely place me in a niche position as an expert IT technician with any leading IT multinational corporation.

**What do you feel you are getting out of your major?**

Confidence, for one thing — confidence that I made the right decision in coming to UNH. I definitely feel that this university was the best choice for the career path I’ve chosen. A lot of it has to do with the understanding and helpful professors here. They recognized and groomed my talents in the right direction. I’m so thankful for that.

**Do you have any advice for students and families interested in UNH?**

To students, I say: Try to manage your time better. The tasks are challenging and timelines are demanding. If you don’t manage your time from day one, it will be a terrible task later on. And to parents: You will be really happy that you chose UNH for your student. And I’m getting that directly from my own parents!
What are you currently doing, and how did you get there?
Currently, I am the Lead Excel Developer for Pharmaceutical Data Services in Hamden, Connecticut. We are a fast-paced custom software and reporting data service provider for the pharmaceutical industry. I was given the opportunity back in 2006 by Dr. M. Ali Montazer to begin an internship at this company. The internship quickly developed into a full-time job, and over time, my responsibilities, skill level, and business knowledge blossomed. Considering the fact that I have stayed at the company for nearly a decade, I would highly rate UNH's job placement capabilities. I believe job placement capabilities are a crucial element when selecting a college or university to attend, but they often are overlooked.

How did UNH prepare you for life after college?
UNH's computer science department focuses a great deal on theory and uses C as a language for the basis of understanding. The fundamentals of writing clean, well-documented code, understanding memory management, efficiency, avoiding the use of global variables, and developing and analyzing algorithms are stressed throughout the program. All of this becomes second nature to you as a programmer, to the point where you can apply these skills to any language used in the industry. This method of teaching made me become a more efficient programmer in a job where rapidly developing and modifying software is part of the daily routine. The University also incorporates technical writing, math, and electronics courses from other departments into the program. This complements the degree and helped me become a more well-rounded developer.

What are some of your favorite memories about your time at UNH?
Looking back, I would say the most impressive experience I had at UNH was taking a course with Dr. Eggert and watching him program C in VI within a Linux terminal. He would code for a half hour without testing or compiling, using no mouse or graphical interface. He gave you the old school 1970s programming experience. He’d write complex code using pointers to walk around in arrays, do some bit shifting, perhaps some shared memory semaphores, or pipes to cross talk between programs. He would explain what he’s doing, then cross his fingers and compile and run the program. It would work on the first shot, which shows the level of talent the professors have at UNH.

What can you say about the faculty and staff at UNH?
I’ve always considered Dr. Fischer, Dr. Eggert, Dr. Chandra, and Dr. Adams to be the key players in my education at UNH. These professors are professional and beyond well educated, and they can clearly discuss a variety of topics with a roomful of students having a diversity of education levels. The additional professors and adjunct professors are all great teachers—a well-selected staff of educators. Teacher's assistants are available, and the Center for Learning Resources is there for additional help.

What advice would you give to prospective students and their families?
Try to decide on what type of job you want. Decide if you want to become a system administrator, network administrator, database administrator, or software programmer. There are a large variety of computer jobs out there. UNH offers a diversity of courses, and you can focus on the topics that interest you the most.
BRIAN ZUK ’03
B.S. Computer Science
with a minor in Industrial Engineering

What are you currently doing, and how did you get there?
I am currently a Systems Engineer for EMC Corporation. Previously, I spent fourteen years as a Unix Systems Engineer and Unix team manager for a handful of Fortune 1000 companies. Whatever spare time I have left is taken up chasing after my three children, all of whom have somehow gained unlimited energy.

How did UNH prepare you for life after college?
I think the advantage I gained from my education in computer science at UNH is the ability to understand “the why” — why computer and network systems operate instead of just “how” they operate. It’s the difference between only knowing a single platform and being able to troubleshoot and debug something you’ve never worked on before. My Industrial Engineering minor also has given me the tools to go a step further — understanding why it works now but being able to figure out how to make it more efficient.

What are some of your favorite memories about your time at UNH?
Building soccer-playing robots out of Legos for my Artificial Intelligence class ranks high on the list, but it’s also amazing how much I miss the little things — sitting around in the library all afternoon may not seem like much, but when you’re stuck in an office eight hours every day it starts looking a lot better.

What would you change about your experience at UNH, if anything?
There’s very little, looking back, that I would change.

What can you say about the faculty and staff at UNH?
I always found the faculty and staff very helpful and willing to assist as much as they could. I certainly believed that they always wanted the students to do well and would do their best to provide all their students with the tools needed to do so.

What advice would you give to prospective students and their families?
Remember that you only get out of your education what you put into it. Take responsibility for that education. Don’t expect the professors to chase you for missing homework or skipping classes. Good or bad, you earn every grade.

“...the advantage I gained from my education in computer science at UNH is the ability to understand the ‘why’ — why computers and network systems operate instead of just ‘how’ they operate.”
Study abroad typically has been a near impossibility for engineering students, whose courses are planned according to a critical sequence that cannot be interrupted. UNH wanted to find a way to make it work. We had a brand new campus in Prato, Italy, a will to get our engineering students over there, and, finally, a plan to do it.

First semester of freshman year was the answer. All first-year engineering students take the same fundamental engineering courses, so it was not a problem to simply teach those courses in Italy.

It makes sense for engineers to study in Prato, which lies in the cradle of the Italian Renaissance. After the fall of Rome in 476 A.D., and the thousand years of intellectual darkness, barbarian invaders, wars, and plague that followed, many of the engineering secrets of antiquity had been lost. The Renaissance artists were the engineers of their time and the ones responsible for the rebirth of engineering, thanks to their understanding of dimension and linear perspective.

In addition to engineering courses, students in our Freshman Engineering Study Abroad Cohort are required to take an Italian Language class so that they can immerse themselves more fully.
in the day-to-day Italian lifestyle. They have been doing that con molto entusiasmo ever since we began the program.

Although some parents might think first-semester, freshman study abroad is premature, it actually helps students make the transition from high school to college life more easily. With study abroad, students begin college as part of a small, tightly knit group, with shared interests, and soon-to-be shared, experiences. Upon their return to the West Haven campus, they begin campus life as friends, bonded by everything they’ve seen and done together. Students coming directly from high school, on the other hand, are often overwhelmed by the sea of thousands of new faces — all of them total strangers.

One computer science professor had his own observation on the benefit: “They come back with a level of maturity and leadership ability that you don’t see in many first-year students.”
Students can gather a wealth of knowledge from books, lectures, and guest speakers, but nothing completes and complements that knowledge like a job. Entering the workforce and assuming responsibilities helps students mature as they develop their skills and acumen and apply what they’ve learned in class.

The University of New Haven considers internships to be a critical component of the educational process. We strive to successfully match an intern with the most appropriate work environment. It’s also a given that all three parties in the relationship — UNH, the student, and the internship location — need to devote significant time to make it work. This balancing act, when achieved, results in a quality internship that can lead to developing a strong future employee.

Numerous ways exist to develop and participate in an internship. Working through the internship coordinator, we make every effort to ensure the internship experience is a meaningful one.

COMPANIES THAT HIRE OUR COMPUTER SCIENCE AND INFORMATION TECHNOLOGY STUDENTS OR OFFER THEM INTERNSHIP EXPERIENCES INCLUDE:

- Anton/Bauer
- AT&T
- The Boeing Company
- Broadstripes
- CAS Medical Systems
- Covidien
- Enginiuity
- General Dynamics/Electric Boat
- GKN Aerospace Services
- HABCO Inc.
- Hamilton Sundstrand
- IBM
- Kitchen Brains (FAST)
- Latex International
- Microboard Processing Inc.
- Microsoft
- MITRE Corporation (organization doing research in defense and intelligence)
- Northeast Utilities
- O & G Industries
- Pratt & Whitney
- Sikorsky Credit Union
- TBNG
- Tek-Air Systems
- Timex Corporation
- United Illuminating
- Yale-New Haven Hospital

DID YOU KNOW:

- 76% of employers indicate their primary purpose for sponsoring interns is to recruit entry-level talent.
- 58.6% of 2011 interns were converted to full-time. In addition, 36% more companies offered internships in 2012 versus 2011.
- 83% of employers report higher retention rates for those new hires with internship experience versus those with none.
UNH students are involved with a capital “I.” With over 170 clubs and activities on campus, it’s easy to join and make a contribution. Computer Science and Information Technology students also have their own special groups as well as student chapters of professional engineering societies. These help you connect with like-minded people, giving you valuable opportunities to practice your networking skills. Clubs and organizations dedicated to a particular area of study, such as computer science and information technology, are often where you will take your first steps on the road to a successful career. Some of the connections you make will stay with you for your entire working life and even after retirement.

UNH Cyber Forensics Research and Education Group (UNHcFREG). This multidisciplinary team of students and world-renowned faculty work on reconstructing digital evidence from digital devices such as gaming devices like the Xbox One, mobile devices (iOS and Android phones), and hard drives. Part of the group’s mission is to provide investigative assistance to law enforcement, intelligence agencies, and private corporations.

UNH Wireless Research Group (UNHwRG). A team of students and faculty with worldwide reputations, this group works on improving the state of the art in wireless networking, collaborating with students and researchers from 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.

Engineers Without Borders. This group collaborates with local partners to design and implement sustainable engineering projects. Its 14,700 members work with communities to find appropriate solutions for such needs as information systems, water supply, sanitation, energy, agriculture, civil works, and structures.

Society of Women Engineers. This society of pioneers, advocates, and mentors supports and guides the collegiate and professional journey of women engineers, giving them a vast pool of resources to further their personal and career development.

National Society of Black Engineers (NSBE). With more than 30,000 members worldwide, NSBE is one of the largest student-governed organizations based in the U.S. Its mission is “to increase the number of culturally responsible Black engineers who excel academically, succeed professionally and positively impact the community.” Member benefits include leadership training, professional development activities, mentoring opportunities, and career placement services.

Society of Hispanic Professional Engineers (SHPE). SHPE seeks to change lives by empowering the Hispanic community to realize its fullest potential and to impact the world through STEM (science, technology, engineering, and mathematics) awareness, access, support, and development.