

Undergraduate Program in **ELECTRICAL ENGINEERING**

Facts About EE@UB

- Full-time faculty: 28
- Average starting salary:
\$65,000

Degrees Offered

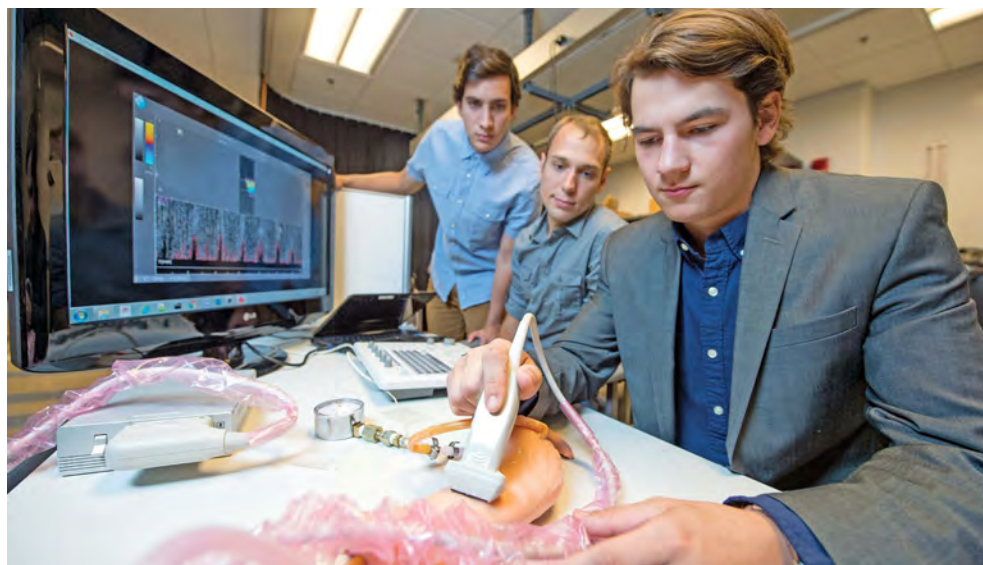
- BS, MS, MEng, PhD
- A five-year BS EE + MBA degree is also available

Electrical Engineering: Lead to a Better Future

The field of Electrical Engineering is built on the shoulders of giants—Tesla, Edison, Marconi, Bell—to meet the energy and telecommunication needs of our society. Out of advancements in electronics and photonics technology, Electrical Engineering is everywhere around us. Almost everything we use in our daily lives has a chip in it and implements some communication protocol and/or some sophisticated signal processing algorithm.

Electrical Engineers provide energy solutions to light our homes; design, analyze and optimize wireless communication devices and networks that revolutionize the way we live; advance underwater communication technologies for monitoring/sensing oceanic environmental changes; design smart software radio systems and networking protocols to facilitate ubiquitous terra-bit volume multimedia communications; develop biomedical devices and instrumentation that saves lives; use nanotechnology to produce better, faster, brighter, and stronger materials for solar cells and sensing devices; and advance new green technologies that will power our future while protecting the environment.

Electrical engineers can be found in almost all sectors of the work force, including research and development, product design, manufacturing operations, service, technical sales, marketing, consulting, education, law, and policy-making.



Placement Opportunities for Electrical Engineers

Our graduates have been hired by Alcatel Lucent, AMD, Cisco, Facebook, Ford, General Electric, General Motors, Google, Hewlett-Packard, IBM, Intel, Lockheed Martin, Micron, Moog, Motorola, NASA, National Grid, National Security Agency, Nokia, Qualcomm, Rockwell, Texas Instruments, US Department of Defense, US Department of Energy and many others.

Curriculum Overview

[FRESHMAN-SOPHOMORE]

In these two years, students build the basic engineering and mathematics skills needed for the practice of electrical engineering. Introductory courses include calculus, chemistry for engineers, engineering solutions, and physics. Students also take circuit analysis, digital principles and signals.

[JUNIOR]

The third year develops the foundation of electrical engineering. Students learn applied electromagnetics, communications, computers and systems, semiconductors and electronics through courses in electronics, labs, microprocessors, microcomputers, probability, and communications.

[SENIOR]

Material from the first three years forms a solid foundation for exploring advanced systems and specific applications via technical electives courses. In addition, Senior Design Implementation, a capstone course taken in the final semester of study, allows students to work as part of a team in developing projects, learning how to take a design from a concept on paper to a finished product. These hands-on laboratory and project experiences allow our seniors to gain real-world experience and to prepare for the job market or graduate study.

Specializations

By selecting technical electives, students can specialize in one of four areas:

- Solid State Electronics
- Optics and Photonics
- Signals, Communications, and Networking
- Energy Systems

Did You Know?

Students with an interest in Business and Electrical Engineering can pursue an MBA in addition to a BS in EE by following the EE/MBA path through our partnership with the School of Management.

Did You Know?

In the US, there are more than two million engineers. More than 25% of engineering jobs are in electrical engineering, which is one of the top 10 bachelor's degrees in demand, according to the National Association of Colleges and Employers (NACE) 2015 Job Outlook.

Student Excellence and Recognition

Our undergraduates consistently receive scholarships awarded by the university, industry, state and federal government and agencies. For example, **Kristina Monakhova** was awarded the prestigious Goldwater Scholarship, an honor bestowed on just 260 students nationwide, for academic merit in the study of mathematics, science and engineering.



Work Opportunities

Internships expose students to the profession of engineering, connecting the classroom to the real world. Employers look for people with a proven track record, so real-world work experience is one of the best ways to prepare for becoming a professional engineer. Many students gain industrial experience during the summer, taking advantage of established internship programs, or designing one of their own. Please see the School's Experiential Learning Programs web page for further information.

Undergraduate Research

Undergraduates are encouraged to become involved in meaningful research with distinguished EE faculty. Such research can add impressive experience to a resume and teach lessons that will last a lifetime. Many EE undergraduates are supported by on-campus programs, such as the EE Undergraduate Research Scholars Program, CSTEP (Collegiate Science Technology Entry Program), The Honors College, McNair Program, Acker Scholars, University Scholar or externally-funded scholarships and fellowships.

"Research in the Energy Systems Institute has been a significant learning experience for me, professionally and personally. It has supplemented my knowledge gained from classes and also prepared me for the work force. In my academic journey, research has been one of my greatest milestones and has placed me on the right path to set even higher goals and aspirations."

—**Antonia Upia** (BS EE '11)

Study Abroad Program

UB Electrical Engineering offers students the opportunity to study at top universities around the world. Through the Study Abroad Program, undergraduates may spend a semester taking courses, in English, at such institutions of higher learning as ENSEA or Telecom Paris Sud in France; Sapienza University of Rome in Italy; Universidad Politecnica de Valencia in Spain; or Chalmers University in Sweden. EE has scholarships available to students who pursue these international experiences.

Student Clubs and Activities

Many undergraduates are active in student clubs and activities related to engineering. Participating in such activities provides our undergraduates with an opportunity to augment their educational experience and get the most out of their engineering degree.

The UB Space Bulls Robo-Ops Team is an undergraduate student group that brings theory from the classroom into practice. Team members design and assemble their own robotic vehicle to compete against other university teams in at NASA's Johnson Space Center Rockyard, a test area that simulates the surface of Mars.

In addition to the UB Space Bulls, there are many other student organizations open to our undergraduates including local chapters of the Institute for Electrical and Electronics Engineers, Engineers for a Sustainable World, Society of Women Engineers, UB Robotics, Society of Hispanic Professional Engineers, Optics Society of America and several engineering honor societies.

To apply, please visit admissions.buffalo.edu

Successful Alumni



"The UB education is something that you should really value. It's allowed me to explore the farthest reaches of our universe, put instruments

and spacecraft on the surfaces of other planets, and to explore and understand our earth in new and better ways."

Christopher Scolese (BS EE '78) is one of the world's leading authorities in space systems engineering. As director of NASA's Goddard Space Flight Center, he has been instrumental in shaping numerous earth science and deep space exploration missions, resulting in significant scientific breakthroughs and advancements, as well as a better understanding of our planet, solar system and universe.

Award-Winning Faculty

The department has recently grown to 28 faculty members, recognized for their research and teaching accomplishments.



One example is

Natalia Litchinitser,

an internationally renowned leader in the field of optics and a Fellow of the Optical Society of America. Professor Litchinitser teaches such undergraduate courses as Nanophotonics and welcomes undergraduates into her laboratory for hands-on learning experiences.

CONTACT INFO

Stella Batalama

Chair
716.645.1147
eechair@buffalo.edu

Kevin Burke

Co-Director of Undergraduate Studies
716.645.1038
kmburke@buffalo.edu

Michael Langberg

Co-Director of Undergraduate Studies
716.645.1047
mikel@buffalo.edu



University at Buffalo

Department of Electrical Engineering

School of Engineering and Applied Sciences

engineering.buffalo.edu/electrical.html

[230 DAVIS HALL | BUFFALO, NEW YORK 14260 | 716.645.3115]