

# Department of Electrical and Computer Engineering

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Our department serves as a statewide focal point for innovation, entrepreneurship, and economic development. ECE is nationally recognized for attracting many of the best and brightest students from around the world and our graduates are aggressively recruited by leading engineering firms, startups, corporations, government agencies, and research universities.

## What's Electrical Engineering?

Electrical engineers design many of the systems that we use every day, including the nation's electrical power grid, computer systems, cell phones, communications satellites, biomedical devices, automatic control systems, robotics, nanotechnology, renewable energy, and much more. Our students use scientific and engineering principles to design new and better electronics, solve real-world challenges, and improve our quality of life.

## What's Computer Engineering?

Computer engineers design computers and computer-based systems, and their work impacts nearly every aspect of modern technology: the Internet, smartphones, video games, 3DTV, biomedical equipment, autonomous vehicles, WiFi and cellular networks, and much more. Computer engineers are, first and foremost problem solvers – they make computers work better, faster and more efficiently. Computer engineering is among the most lucrative fields in engineering, according to Forbes magazine.

Unlike electrical engineering or computer science, computer engineering primarily deals with how to build computer systems, hence there is more emphasis on hardware and low-level software that make up the systems. In contrast, computer science explores how to process information using computer systems, thus leading to a focus in software.

## Global Reputation. Individual Attention.

Electrical and computer engineers enjoy flexibility in career options and many engineering careers turn toward management as they mature. NC State University is known worldwide for providing students with the knowledge and skills necessary in all aspects of Electrical and Computer Engineering.

NC State is consistently ranked in the top ECE programs in the United States. We not only teach students the fundamentals of engineering, we give students the ability to expand and develop their own creative capabilities. Our program also strives to develop each student's skills in all aspects of the field. This enables students to broaden their realm of knowledge to include a variety of issues that they will face in their future careers.

## Scholarship Opportunities

A wide variety of scholarship opportunities exist for students in the ECE department (<https://ece.ncsu.edu/ugrad/scholarships/>), in addition to those offered by the University and the College of Engineering (<https://www.engr.ncsu.edu/academics/undergrad/scholarships/>)—these

opportunities span a range of criteria, from academic performance, to need, to area of study.

## Facilities

With state-of-the-art teaching and research facilities on Centennial Campus, ECE promotes ongoing research and collaboration between industry located on campus and other departments.

ECE's administration and main teaching labs are located in Engineering Building II (<https://ece.ncsu.edu/tour/>), with additional research labs spanning the Monteith Research Center and Keystone Science Center.

## MakerSpaces

The Kolbas MakerSpace provides all the tools required for students to work on electrical projects with state-of-the-art testing and soldering stations, Pick-and-Place component placement machine, in addition to a dozen 3-D printers to aid in prototyping.

The Troxler MakerSpace allows for fully-fledged fabrication with a complete wood and metal workshop, including a ShopBot CNC router and a WAZER waterjet cutter.

The MakerSpace (<https://my.ece.ncsu.edu/makerspace/>) enables and encourages students to be involved in hands-on engineering projects in their coursework and of personal interest.

## Teaching Labs

The Electrical and Computer Engineering curriculum is designed to allow each student the opportunity to gain knowledge and complete comprehension of all concepts in this field. The department is able to see that these demands are met by maintaining teaching labs, technical support staff, modern computing equipment, and industry-standard software.

The labs include spaces devoted to embedded systems, integrated circuit design, microelectronics, power electronics, wireless networking, and mechanics.

## Troxler Design Center

The Troxler Design Center is named in recognition of William F. Troxler, and is dedicated to the Department's Senior Design (<https://seniordesign.ece.ncsu.edu>) courses. Originally located in 111 Lampe Dr., the center moved in the Fall of 2005 to a larger facility in Engineering Building II.

At over-2,000 sq. ft., the Troxler Design Center is the ECE Department's largest lab, and contains workspace and storage space as well as multiple meeting areas for group meetings or presentations. Large, high-quality workbenches make up the 20 stations for project teams, which also include a dedicated computer for each team. Cutting-edge test equipment and instruments are provided throughout the lab, thanks in large part to the generous donations of William F. Troxler and the Troxler family.

## Nanofabrication Facility

The Nanofabrication facility (<https://nnf.ncsu.edu>) is located in the Larry K. Monteith Engineering Research Center and occupies a 7400 sq. ft. cleanroom. The facility has a full range of micro- and nano-fabrication capabilities including photolithography, reactive ion etching (RIE), deep RIE, low-pressure chemical vapor deposition (LPCVD), plasma enhanced CVD, rapid thermal anneal, thermal oxidation, solid source diffusion,

thermal and e-beam evaporation, sputtering, chemical mechanical polishing, various wet etching and cleaning processes, along with various characterization tools.

Many of the tools are capable of processing on a broad range of substrates such as semiconductor glass, ceramics, and plastics with sizes from small pieces to 6# wafers.

## Faculty

### Department Head

V. Misra, *MC Dean Distinguished University Professor*

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### Associate Department Head

G.T. Byrd, *Professor*

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### Director of Graduate Programs

P.D. Franzon, *Cirrus Logic Distinguished Professor*

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### Coordinator of Advising

C.W. Townsend, *Senior Lecturer*

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### Named Distinguished Professor

B.J. Baliga

S. Bhattacharya

A.Y. Bozkurt

P.D. Franzon

I. Husain

F.A. Kish

D.D. Stancil

C.M. Williams

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### Distinguished Professors

S.M. Bedair

S.M. Lukic

J. Muth

H.T. Nagle

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### Professors

M.E. Baran

G.T. Byrd

A. Chakraborty

H. Dai

W.R. Davis

A. Duel-Hallen

D.Y. Eun

B.A. Floyd

I. Guvenc

B.L. Hughes

K.W. Kim

A.H. Krim

M. Kudenov

E. Lobaton

N. Lu

O. Oralkan

M.C. Ozturk

D. Ricketts

E. Rotenberg

M.L. Sichertiu

J. Tuck

D. Vashae

J.V. Veliadis

I. Viniotis

W. Wang

J. Wierer

H. Zhou

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### Associate Professors

J. Adams

A. Awad

D. Baron

M. Becchi

M. Daniele

A.J. Dean

Q. Gu

Z. Pantic

W. Tang

T. Wu

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## Assistant Professors

S. Mirbagher Ajorpaz

A. Aysu

A.J. Bandodkar

D. Farfurnik

A. Kody

S.C. Lin

Y. Liu

A. Mitra

S. Pavlidis

S. Venkatesh

A. Vázquez-Guardado

C.W. Wong

K. Zhou

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## Teaching Professors

R. Gupta

G. Yu

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## Teaching Associate Professors

M. Cutitaru

R.J. Evans

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## Teaching Assistant Professor

E. Veety

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## Professor of the Practice

M. Brain

J. Edmondson

J. Gajda

L. White

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## Research Professor

D.C. Hopkins

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## Research Associate Professor

W. Yu

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## Research Assistant Professor

J. Reynolds

H. Tu

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## Senior Lecturers

J. Carlson

C. W. Townsend

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## Plans

- Computer Engineering (BS) (<http://catalog.ncsu.edu/undergraduate/engineering/electrical-computer/computer-engineering-bs/>)
- Electrical Engineering (BS) (<http://catalog.ncsu.edu/undergraduate/engineering/electrical-computer/electrical-engineering-bs/>)
- Electrical Engineering (BS): Renewable Electric Energy Systems Concentration (<http://catalog.ncsu.edu/undergraduate/engineering/electrical-computer/electrical-engineering-bs-renewable-electric-energy-systems-concentration/>)