ELECTRICAL ENGINEERING

Engineering Student Development Center
Academic and Career Advising
3612 SC | 319.335.5763
engineering.sdc@uiowa.edu

FOCUS AREAS at IOWA:

Applied Physics	Computer Networks	Power Systems
Big Data/Data Mining/ Machine Learning	Control Systems	Pre-Law
Bioinformatics	Electrical Breadth	Pre-Medicine
Business	Electronic Circuits	Semiconductor Devices
Communication Systems	Entrepreneurship	Signal & Image Processing
Computer Breadth	Integrated Circuits	Software Engineering
Computer Hardware	Photonic Systems	Sustainability

CAREERS

- **Application Engineer:** Develop, create, and modify general computer applications software or specialized utility programs.
- **Computer Hardware Engineer:** Design and develop computer hardware, such as circuit boards for computer processors, modems, and printers. Also test hardware and supervise its installation.
- **Electronics Engineer:** Design, develop and test components, devices, systems or equipment that use electricity as part of their source of power, from cell-phones and computers to refrigerators and heating systems.
- **Semiconductor Engineer:** Develop, test and optimize semiconductor device manufacturing processes. Conduct final testing and optimization, and device and chip packaging.
- **Optical Engineer:** Design, test, analyze and qualify LEDs, lasers, waveguides, and optical interconnects for integration in photonic chips and circuits.
- **Quantum Engineer:** Design and model qubit architectures for scalable quantum computing. Develop quantum computing, cryptography and communication algorithms. Design, develop and test quantum computer hardware and software.
- **Software Engineer:** Design, develop, test and maintain software.
- **Engineer in almost every field:** Examples include naval engineer, automotive engineer, aerospace engineer, oil and gas engineer, medical engineer, power/renewable energy engineer, material engineer, control engineer, telecommunication engineer, network engineer and many others.

*Some of these positions may require an advanced degree.

SPECIALIZATIONS WITHIN THE FIELD

- Acoustics
- Applied Physics
- Automation
- Bioengineering
- Broadcasting
- Circuits
- Computer Software
- Computer Hardware
- Controls
- Energy Systems
- Embedded Systems
- Financial Services
- Data Science/Machine Learning
- Healthcare Electrical insulation
- HVAC systems
- Imaging processing
- Integrated Circuits
- Internet of Things (IoT)
- Medical Device Development
- Nanotechnology
- Lasers and Electro-optics
- Photonic Systems
- Power Systems
- Radio Frequency (RF) Electronics
- Robotics
- Semiconductor Devices
- Signal Processing
- Software Engineering
- Supercomputing
- Sustainability
- Telecommunications
- Ultrasonics

EMPLOYERS

- Alliant Energy
- Amazon
- Apple
- Boeing
- Boston Electronics
- Caterpillar
- Cerner
- Collins Aerospace
- Design Engineers
- DuPont Pioneer
- Edward Lifesciences
- Emerson-Fisher Controls
- Facebook Oculus
- GE Healthcare
- Google
- Hologic
- Honeywell
- IBM
- Intel
- Intermec
- John Deere
- Lockheed Martin
- Medtronic
- MODUS
- Microsoft
- Northrup Grumman
- Oracle
- Pariveda
- Raytheon
- Rigetti Computing
- Samsung
- Schneider Electric
- Skyworks
- SpaceX
- Tesla
- Whirlpool

https://careers.uiowa.edu/post-graduation-data#employment-report

ELECTRICAL ENGINEERING

Department of Electrical and Computer Engineering

Sample Four-Year Plan

First Year

1st Semester		sh
ALL	**RHET:1030 Rhetoric: Writing and Communication**	4
F/S	**MATH:1550 Engineering Calculus I**	4
	(P: ALEKS score ≥ 75 or MPT Level 3 score ≥ 9)	
F/S	**CHEM:1110 Principles of Chemistry I**	4
	(P: ALEKS score ≥ 55 or MPT Level 3 score ≥ 9)	
F	**ENGR:1100 Intro to Engineering Problem Solving**	3
		16

2nd Semester		sh
ALL	**General Education Course**	3
F/S	**MATH 1560 Engineering Calculus II**	4
	(P: MATH:1550)	
F/S	**MATH:2550 Engineering Matrix Algebra**	2
	(P: MATH:1550)	
F/S	**PHYS:1611 Introductory Physics I / Lab**	4
	(C: MATH:1550)	
F/S	**ENGR:1300 Intro to Engineering Computing**	3
	(C: MATH:1550)	
		16

Second Year

3rd Semester		sh
ALL	**General Education Course**	3
F/S	**MATH:2560 Engineering Differential Equations**	3
	(P: MATH:1560 & MATH:2550)	
ALL	**PHYS:1612 Introductory Physics II**	4
	(P: PHYS:1611; C: MATH:1560)	
ALL	**ENGR:2120 Electrical Circuits**	3
	(C: MATH:2560)	
F/S	**ENGR:2730 Computers in Engineering**	3
	(P: ENGR:1300)	
		16

4th Semester		sh
F/S	**MATH:3550 Engineering Vector Calculus**	3
	(P: MATH:1560 & MATH:2550; C: MATH:2560)	
F/S	**STAT:2020 Probabilty & Statistics For Engr & Phys Sci**	3
	(P: MATH:1560)	
S	**PHYS:2704 Physics IV**	3
	(P: PHYS:1612 & MATH:1550)	
F/S	**ECE:2400 Linear Systems I**	3
	(P: ENGR:2120 & MATH:2560)	
F/S	**ECE:2410 Principles of Electronic Instrumentation**	4
	(P: PHYS:1612, ENGR:2120, & MATH:2560)	
		16

Third Year

5th Semester		sh
F	**ECE:3000 Professional Seminar:** Electrical Engineering	1
	(Junior Status)	
F	**ECE:3320 Intro to Digital Design**	3
	(Sophomore Status)	
F	**ECE:3400 Linear Systems II**	3
	(P: ECE:2400)	
F	**ECE:3410 Electronic Circuits**	4
	(P: ECE:2400 & ECE:2410)	
F	**ECE:3700 Electomagnetic Theory**	3
	(P: MATH:3550 & PHYS:1612)	
ALL	**Elective:** Focus Area -Technical	3
		17

6th Semester		sh
ALL	**General Education Course**	3
F/S	**ECE:3360 Embedded Systems**	3
	(P: ENGR:2730 & ECE:3320; C: ECE:2410)	
S	**ECE:3500 Communication Systems**	3
	(P: ECE:2400)	
S	**ECE:3600 Control Systems**	3
	(P: ECE:2400)	
S	**ECE:3720 Semiconductor Devices**	3
	(P: PHYS:2704 & ECE:3410)	
ALL	**Elective:** Focus Area, Minor, Certificate, etc. (minimum 2sh)	2
		17

Fourth Year

7th Semester		sh
ALL	**General Education Course**	3
F/S	**ECE:4880 Principles of ECE Design**	3
	(P: Senior Status; ECE:2410, & ENGR:2730)	
ALL	**Elective:** Focus Area - 5000 level ECE	3
ALL	**Elective:** Focus Area -Technical	3
ALL	**Elective:** Focus Area - Breadth	3
		15

8th Semester		sh
ALL	**General Education Course**	3
F/S	**ECE:4890 ECE Design**	3
	(P: ECE:4880 and 3 of: ECE:3330, ECE:3350, ECE:3360, ECE:3400, ECE:3410, ECE:3500, ECE:3600, CS:3330)	
ALL	**Elective:** Focus Area - 5000 level ECE	3
ALL	**Elective:** Focus Area, Minor, Certificate, etc.	3
ALL	**Elective:** Focus Area - Depth	3
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