



**What is Computer Engineering?** Computer engineering applies electrical engineering principles to the design of computers, networks of computers, or sometimes systems that include computers. Although traditionally part of electrical engineering, computer engineering has now come to be recognized as a separate engineering field.

## Major areas of emphasis

To prepare students for a career in this evolving profession, the Bachelor of Computer Engineering degree stresses the basic ideas on which the profession is built. In addition, we offer a range of technical electives that shape the details of each student's program in the junior and senior years. By selecting appropriate technical electives, you can specialize in aspects of computer engineering that are of special interest to you. The department also offers a minor in bioelectrical engineering.

Active research in the department ensures that the content of the undergraduate program is constantly renewed and maintained at a challenging technical level and integrates discovery learning into the program. Opportunities abound for computer engineering undergraduates to work with faculty and graduate students as research assistants, either for pay or independent study credit. We want our graduates to have the skills necessary to pursue advanced degrees.

Research in the department covers a broad range of topics with particular strengths in communications and signal processing, electronic devices and materials, optics and electromagnetics, and computer networks and systems. More detailed information about our research program is available on our website.

Electrical and computer engineering graduates of UD have gone on to some very exciting, rewarding, and successful careers. One graduate is a founder of Silicon Graphics, a well-known manufacturer of high-end computer workstations. Another received an Academy Award for technical achievement in motion picture special effects. The proliferation of computer technology over the past several decades has created an abundance of career opportunities in this field.

## Endless career opportunities

**The pervasive impact of computer engineers:** From heart-rate monitors and refrigerators to laptops and mobile phones, computerized gadgets are everywhere. More and more of these gadgets are communicating and coordinating through networks to massive cloud computing centers that are distributed around the world.

**More than CPU designers:** Not only do computer engineers design computers and digital equipment, but they also design software that runs on the computers and develop algorithms that are implemented by the software.

**Information:** Computer engineers work with all aspects of information whether it is voltage levels on a wire, streams of bits moving between mobile phones, files distributed across tens of thousands of servers, or new concepts that are trending on Twitter.

**Reliability and security:** Computer engineers also work to ensure that the systems they design are resilient to hackers and failures, such as electrical outages. For example, the reliability of today's distributed storage systems exceed 99.999999999%,

which means that it is more likely that an asteroid large enough to wipe out the dinosaurs will hit the planet than for data to be lost.

**The future:** Can you imagine life without the Internet? You also can't imagine what computer engineers will build next. Join us and build the future.

Computer engineering also overlaps the areas of computer information systems, computer science, and information science. It is common for students majoring in computer engineering to complete a minor in computer science. And because this is an area currently ripe for entrepreneurship, some computer engineers also choose to pursue additional training in business.

## Additional study opportunities

### Exploring the humanities and social sciences through the breadth requirements

All engineering curricula include self-selected humanities and social science courses. The required 21 credits of breadth coursework include 18 credits of humanities and social sciences, and 3 credits of chemistry, math or physics.

*Please note: 3 of the above credits must also satisfy the Multicultural Requirement (University requirement); 6 credits must be above the introductory level (College requirement); and already completed Advanced Placement (AP) credit may apply toward these requirements.*

### Exploring other subjects through minors

A minor is a small set of courses in a particular subject area that differs from a student's major. Minors normally require five to seven courses to be completed in the subject area. Students may double-count courses for credit against both majors and minors. If electives are chosen carefully, minors can easily be integrated into the program requirements. Nearly half of all engineering students have at least one minor, many have two or three.

### 4+1 Bachelor of Computer Engineering/Master of Science Electrical & Computer Engineering

Talented undergraduates are urged to apply to the ECE department's 4+1 BCpE/MSECE program. The program allows students to finish both a Bachelors degree and a Masters degree in five years. Students must be accepted into the graduate program, must take 6 of their technical elective credits in 600 level ECE courses acceptable to the ECE graduate program, and must complete all other requirements for the BCpE degree. More information about the programs can be found at the ECE graduate page in the UD catalog.

## After graduation

On average, 70–80% of graduates with a Bachelor of Computer Engineering degree choose employment in private industry, government laboratories and agencies, and non-profit research centers. Approximately 15–20% of computer engineering graduates choose to continue their education toward a master's or Ph.D. degree, and some graduates will opt to attend medical, law, or business school. Students who earn advanced degrees in engineering usually pursue a career in advanced research or as a faculty member in a college of engineering.

## Career resources

The Career Services Center provides comprehensive services to all matriculated undergraduate students, primarily in the development and implementation of career and educational plans. The Career Services Center can help you determine a major, find internships or full-time jobs, build your resume and cover letter, practice interview skills, apply to graduate or professional school, or network with employers. Visit [www.udel.edu/CSC](http://www.udel.edu/CSC) for details.

## Computer Engineering Curriculum

Fall			Spring		
<b>First Year</b>			<b>First Year</b>		
COURSE #	COURSE DESCRIPTION	CREDITS	COURSE #	COURSE DESCRIPTION	CREDITS
EGGG 101	Introduction to Engineering (FYE)	2	CISC 181	Introduction to Computer Science	3
CHEM 103	General Chemistry I	4	PHYS 207	Fundamentals of Physics I	4
MATH 241	Analytic Geometry & Calculus A	4	MATH 242	Analytic Geometry & Calculus B	4
CISC 106	General Computer Science for Engineers	3	CPEG 202	Introduction to Digital Systems	3
	Breadth Requirement Elective 1*	3	ENGL 110	Critical Reading and Writing	3
16			17		
<b>Second Year</b>			<b>Second Year</b>		
COURSE #	COURSE DESCRIPTION	CREDITS	COURSE #	COURSE DESCRIPTION	CREDITS
ELEG 205	Analog Circuits I	4	CPEG 222	Microprocessor Systems	4
CISC 220	Data Structures	3	ELEG 305	Signals & Systems	3
MATH 243	Analytic Geometry & Calculus C	4	ELEG 309	Electronic Circuit Analysis I	4
PHYS 208	Fundamentals of Physics II	4	MATH 341	Differential Equations w/ Linear Algebra I	3
15			Breadth Requirement Elective 2		
			3		
			17		
<b>Third Year</b>			<b>Third Year</b>		
COURSE #	COURSE DESCRIPTION	CREDITS	COURSE #	COURSE DESCRIPTION	CREDITS
ELEG 320	Field Theory I	4	ELEG 310	Random Signals and Noise	3
CPEG 323	Intro to Computer Systems Engineering	3	CPEG 324	Computer System Design I	3
MATH 342	Differential Equations w/ Linear Algebra II	3	CISC 361	Operating Systems	3
	Written Communication Elective	3	ELEG	Foundation Elective	3
	Breadth Requirement Elective 3	3	Breadth Requirement Elective 4		
16			15		
<b>Fourth Year</b>			<b>Fourth Year</b>		
COURSE #	COURSE DESCRIPTION	CREDITS	COURSE #	COURSE DESCRIPTION	CREDITS
CPEG 498	Senior Design I	3	CPEG 499	Senior Design II (DLE)	3
CPEG 419	Computer Communications Networks	3	ELEG 491	Ethics and Impacts of Engineering	3
ELEG/ CPEG	4XX Technical Elective 1	3	ELEG/ CPEG	4XX Technical Elective 2	3
	Technical Elective 1	3		Technical Elective 2	3
	Breadth Requirement Elective 5	3	Breadth Requirement Elective 6		
15			15		
<b>TOTAL CREDIT HOURS: 126</b>					

\*A list of Breadth Requirement courses is available at: [www.engr.udel.edu/advise/undergrad\\_programs.html](http://www.engr.udel.edu/advise/undergrad_programs.html)