

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. The following will give you an idea as to how you might match your interests to a career in computer engineering:

NEED TO NETWORK? Enabling computers to communicate and work together, from wireless local area networks to the global internet, is a primary goal of computer engineers.

CAN YOU HANDLE HARDWARE? In addition to the computers themselves, computer engineers design peripherals—the drives, scanners, printers, and displays that enable us to provide input and receive output in a variety of formats.

LOOKING FOR THE SMALL PICTURE? Computer engineers are constantly working to create the next generation of smaller and faster circuits, chips, and processors.

GOTTA HAVE GADGETS? Consumer products ranging from refrigerators and automobiles to cellular phones and iPods rely on internal computers to function.

WANT TO HALT HACKERS? Staying one step ahead of hackers and others who misuse computer systems is a challenge for computer engineers who seek to improve security and protect privacy.

ENJOY PLAYING WITH REALITY? From computer gaming systems to virtual reality simulation to Hollywood special effects, computers are being used to stimulate and capture our imaginations.

FASCINATED BY THE FUTURE? Computers promise to become even more integrated into our daily lives—perhaps even into our bodies. What's your vision for 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.



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.

Additional Opportunities for Study

Exploring the humanities and social sciences through the breadth requirements

All engineering curricula have at least 21 credits set aside for breadth requirement courses, 18 credits of which are chosen from an extensive list of humanities and social science options. The remaining 3 credits are usually satisfied by chemistry, math, or physics courses all engineering students are required to take. The University requires that 3 credits of breadth requirement coursework satisfy the Multicultural Requirement and the College requires that 6 credits of breadth requirement coursework be above the introductory level. Students entering with Advanced Placement (AP) credit may already have completed several of these courses.

Exploring other subjects through minors

A minor is a small set of courses in a particular subject area that is different from a student's major. Minors normally require five to seven courses to be completed in their subject areas. Because students may double-count courses for credit against both majors and minors, they can often complete a minor by doing no additional work if they choose their elective courses carefully. About half of all engineering students have at least one minor, and many have two or three. Some of the most popular minors for computer engineering majors include bioelectrical engineering, computer science, economics, foreign languages, materials science, mathematics, nanoscale materials, physics, and sustainable energy technology.

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.

Computer Engineering Curriculum

Spring

First Year

COURSE #	COURSE DESCRIPTION	CREDITS
EGGG 101	Introduction to Engineering (FYE)	2
CHEM 103	General Chemistry I	4
MATH 241	Analytic Geometry & Calculus A	4
CISC 106	General Computer Science for Engineers	3
ENGL 110	Critical Reading and Writing	3
		16

Fall

First Year

COURSE #	COURSE DESCRIPTION	CREDITS
CISC 181	Introduction to Computer Science	3
PHYS 207	Fundamentals of Physics I	4
MATH 242	Analytic Geometry & Calculus B	4
CPEG 202	Introduction to Digital Systems	3
	Breadth Requirement Elective 1*	3
		17

Second Year

COURSE #	COURSE DESCRIPTION	CREDITS
ELEG 205	Analog Circuits I	4
CPEG 222	Microprocessor Systems	4
MATH 243	Analytic Geometry & Calculus C	4
PHYS 208	Fundamentals of Physics II	4
		16

Second Year

COURSE #	COURSE DESCRIPTION	CREDITS
CISC 220	Data Structures	3
ELEG 305	Signals & Systems	3
ELEG 309	Electronic Circuit Analysis I	4
MATH 341	Differential Equations w/ Linear Algebra I	3
	Breadth Requirement Elective 2	3
		16

Third Year

COURSE #	COURSE DESCRIPTION	CREDITS
ELEG 320	Field Theory I	4
CPEG 323	Intro to Computer Systems Engineering	3
MATH 342	Differential Equations w/ Linear Algebra II	3
	Written Communication Elective	3
	Breadth Requirement Elective 3	3
		16

Third Year

COURSE #	COURSE DESCRIPTION	CREDITS
ELEG 310	Random Signals and Noise	3
CPEG 324	Computer System Design I	3
CISC 361	Operating Systems	3
ELEG	Foundation Elective I	3
	Breadth Requirement Elective 4	3
		15

Fourth Year

COURSE #	COURSE DESCRIPTION	CREDITS
CPEG 419	Computer Communications Networks	3
ELEG	Foundation Elective 2	3
ELEG/ CPEG	4XX Technical Elective 1	3
	Technical Elective 1	3
	Breadth Requirement Elective 5	3
		15

Fourth Year

COURSE #	COURSE DESCRIPTION	CREDITS
CPEG	Design Requirement (DLE)	4
ELEG 491	Ethics and Impacts of Engineering	2
ELEG/ CPEG	4XX Technical Elective 2	3
	Technical Elective 2	3
	Breadth Requirement Elective 6	3
		15

TOTAL CREDIT HOURS: 126

* A list of Breadth Requirement courses is available at: www.engr.udel.edu/advise/undergrad_programs.html