Computer Engineering Undergraduate Handbook

Revised 9/09

Bachelor of Science in Computer Engineering

Administered by
the Computer Science Department
and
the Charles L. Brown Department of Electrical & Computer Engineering

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Introduction

Computer Engineering is an exciting field that spans topics in both electrical engineering and computer science. Students learn and practice the design and analysis of computer systems, including both hardware and software aspects and their integration. Careers in Computer Engineering (CpE) are as wide and varied as computer systems themselves, which range from embedded computer systems found in consumer products or medical devise, to control systems for automobiles, aircraft, and trains, to more wide-ranging applications in telecommunications, financial transactions, and information systems.

A recent Bureau of Labor Statistics Occupational Outlook Handbook states that “very favorable opportunities” (more numerous job openings compared to job seekers) can be expected for college graduates with at least a bachelor’s degree in computer engineering. It also projects an employment increase of over 38% by 2016 for occupations available to graduates with a bachelor’s degree in computer

Computer Engineering gives you a great working knowledge and balance in both CS & ECE. With the freedom to choose electives in either department, you are in full control of your educational experience and how you wish to enhance your knowledge.

Kevin Chang, 08

engineering. (www.bls.gov/oco.)

Program Objectives

Graduates of the CpE program at the University of Virginia have the knowledge, skills, and attitudes that allow them to make tangible contributions, meet new technical challenges, contribute effectively as team members, and be innovators in computer hardware, software, design, analysis, and applications. They communicate effectively and interact responsibly with colleagues, clients, employers and society.

Faculty from the Computer Science and Electrical & Computer Engineering departments jointly administer the CpE undergraduate degree program at the University of Virginia.

The Computer Engineering Program does not currently offer a minor.

It's the future. Everything is digitized and computer engineering allows you to keep up with changing technology. It's a complex field with many great opportunities for advancement.

Rob Yip, '08

Disciplines

Our curriculum has been carefully designed to ensure that the students obtain an excellent background in both Computer Science and Electrical Engineering, providing breadth across these disciplines as well as depth in at least one. All Computer Engineering students work through an extended sequence of introductory, intermediate and advanced courses:

CS 1110 (101)	Introduction to Computer Science
CS 2110 (201)	Software Development Methods
CS 2102 (202)	Discrete Math I
ECE 2630 (203)	Introductory Circuit Analysis
ECE 2660 (204)	Electronics I
CS 2150 (216)	Program and Data Representation
ECE/CS 2330 (230)	Digital Logic Design
ECE 3750 (323)	Signals & Systems I
CS/ECE 3330 (333)	Computer Architecture
CS 3240 (340)	Advanced Software Development
CS 4414 (414)	Operating Systems
ECE 4435 (435)	Computer Organization & Design
ECE 4440 (436)	Advanced Digital Design
CS/ECE 4457 (457)	Computer Networks

In addition to providing breadth across the two areas, this core of the Computer Engineering program provides depth in the following areas:

Circuits

ECE 2630 (203) Introductory Circuit Analysis
ECE 2660 (204) Electronics I

Software Engineering

CS 2110 (201) Software Development Methods
CS 3240 (340) Advanced Software Development

Digital Logic

ECE/CS 2330 (230) Digital Logic Design
CS 2102 (202) Discrete Math I

Computer Systems

CS 2150 (216) Program and Data Representation
CS/ECE 3330 (333) Computer Architecture
CS 4414 (414) Operating Systems
ECE 4435 (435) Computer Organization & Design
ECE 4436 (436) Advanced Digital Design
CS/ECE 4457 (457) Computer Networks

Grade Requirement

In completing their program of study, computer engineering majors must achieve a "C" average or better in their Computer Science and Electrical Engineering courses.

I decided to major in CPE because it gave me an opportunity to combine two majors into one. I came to UVA interested in computer science, but decided that I wanted to know more about the hardware and doing CPE was the perfect choice for me. In the long run having this major can make the student more marketable because he or she can take on careers in many paths.

Alla Aksel, '04

Degree Curriculum

FIRST SEMESTER		CREDIT HRS.
APMA 1110	Single Variable Calculus	4
CHEM 1610	Chemistry for Engineers	3
CHEM 1611	Chemistry for Engineers Lab	1
ENGR 1620	Introduction to Engineering	4
STS 1010	Lang. Comm. And Tech. Soc.	3
		15 credits

SECOND SEMESTER		CREDIT HRS.
APMA 2120	Multivariate Calculus	4
PHYS 1425	General Physics I	4
CS 1110	Intro. to Computer Science	3
SCI	Science Elective [2]	3
HSS	HSS Elective [1]	3
		17 credits

THIRD SEMESTER		CREDIT HRS.
APMA 2130	Ordinary Differential Equations	4
CS 2110	Software Development Meth.	3
CS 2102	Discrete Math I	3
ECE 2630	Introductory Circuit Analysis	3
HSS	HSS Elective [1]	3
		16 credits

FOURTH SEMESTER		CREDIT HRS.
CS 2150	Program & Data Representation	3
ECE/CS 2330	Digital Logic Design	3
ECE 2660	Electronics I	4
CS/ECE	Elective [3] [5]	3
STS	STS Elective	3
		16 credits

FIFTH SEMESTER		CREDIT HRS.
CS/ECE 3330	Computer Architecture	3
ECE 3750	Signals & Systems	3
APMA 3100	Probability	3
PHYS 2415	Physics II	3
PHYS 2419	Physics II Lab	1
UE	Unrestricted Elective [4]	3
		16 credits

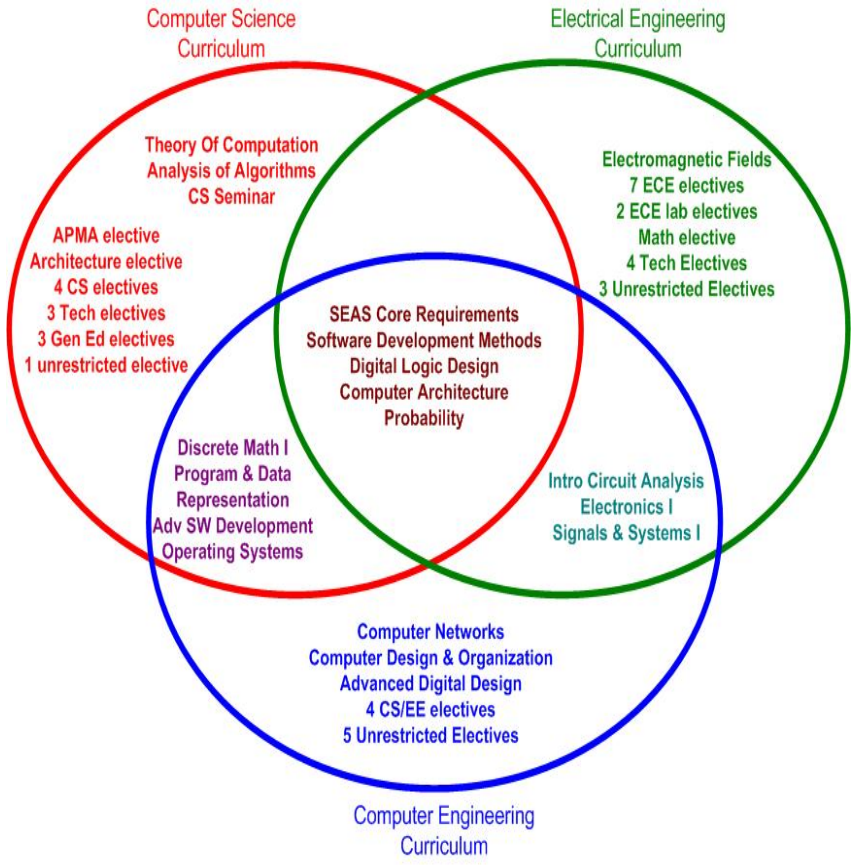
SIXTH SEMESTER		CREDIT HRS.
CS 3240	Advanced Software Development	3
CS/ECE	Elective [5]	3
CS 4414	Operating Systems	3
HSS	HSS Elective [1]	3
UE	Unrestricted Elective [4]	3
		15 credits

SEVENTH SEMESTER		CREDIT HRS.
ECE 4435	Computer Org. & Design	4.5
CS/ECE 4457	Computer Networks	3
CS/ECE	Elective [5]	3
UE	Unrestricted Elective [4]	3
STS 4010	Western Technology & Culture	3
		16.5 credits

EIGHTH SEMESTER		CREDIT HRS.
ECE 4440	Advanced Digital Design	4.5
CS/ECE	Elective [5]	3
UE	Unrestricted Elective [4]	3
STS 4020	The Engineer in Society	3
UE	Unrestricted Elective [4]	3
		16.5 credits

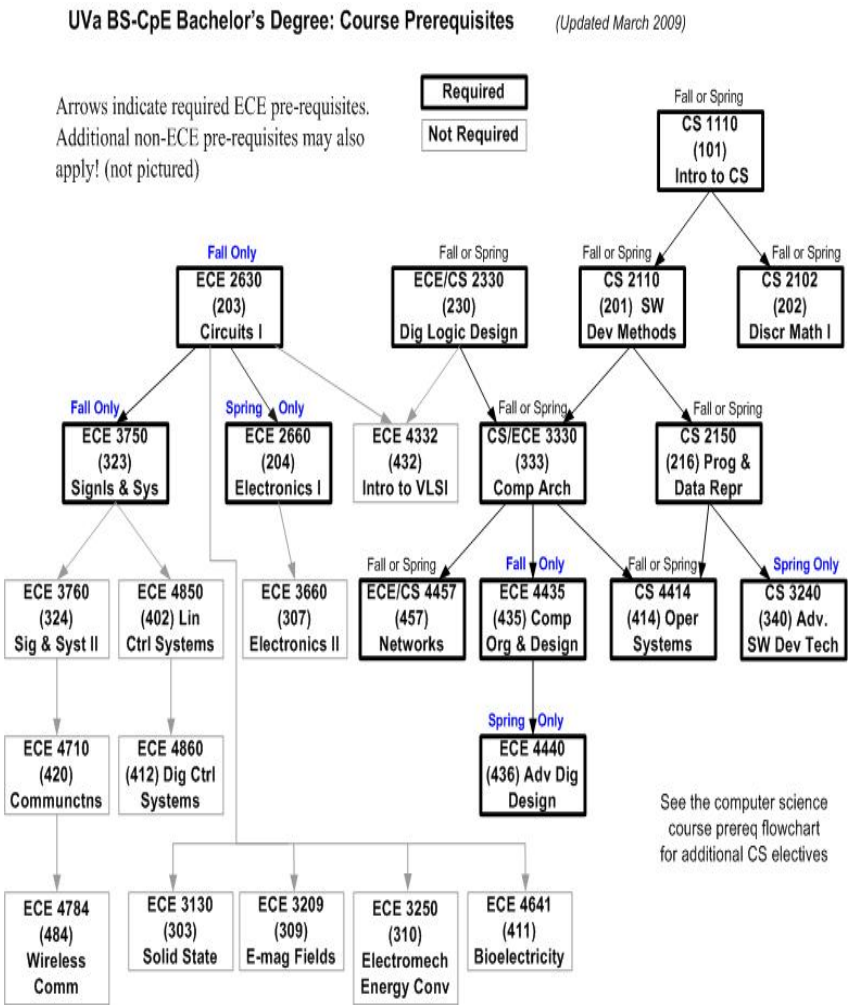
[1] Chosen from the approved list available in A122 Thornton Hall.
[2] Chosen from: among BIOL 2010, 2020; CHEM 1620; ECE 2066; MSE 2090; and PHYS 2620.
[3] Students interested in selected advanced CS electives should take CS 3102. Students interested in selected advanced ECE electives should delay this elective until the sixth semester and take an engineering elective instead.
[4] Unrestricted electives may be chosen from any graded course in the University except mathematics courses below MATH 1310 including STAT 1100 and 1120, and courses that substantially duplicate any others offered for the degree, including PHYS 2010, 2020; CS 1010, 1020; or any introductory programming course. Students in doubt as to what is acceptable to satisfy a degree requirement should get the approval of their advisor and the dean's office, located in Thornton Hall, Room A122. APMA 1090 counts as a three-credit unrestricted elective.
[5] Chosen from CS/ECE course at the 3000 level or higher. Two CS/ECE electives must be 4000 level or above.

Comparison Chart



Relationship between requirements for Computer Science, Electrical Engineering and Computer Engineering

Course Requirement Flowchart



Miscellaneous Information

Please refer to the Undergraduate Record for detailed information about SEAS Academic Rules and Regulations including HSS electives. Guidelines such as Course Load, Academic Probation and Academic Suspension can also be found in the Record.

The Registrar web site provides a Course Renumbering Crosswalk to assist with the transition from 3 to 4 digit course numbers.

http://www.virginia.edu/registrar/search.php