### **Bachelor of Science in Computer**

### **Engineering**

# **Computer Engineering** (BSCE)

### **Degree Program Guide**

The Degree Program Guide is a suggested curriculum to complete this degree program in four years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

#### **Computer Engineering**

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 110	Explore Engineering and Technology	2
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N or CHEM 120	Foundations of Chemistry I Laboratory *** or Foundations of Chemistry I Laboratory for Online Degree Programs	1
MATH 211	Calculus I	4
ENGL 110C	English Composition (grade of C or better required)	3
COMM 101R	Public Speaking	3
	Credit Hours	16
Spring		
ECE 111	Information Literacy and Research for Electrical and Computer Engineering	2
CHEM 123N	Foundations of Chemistry II Lecture	3
MATH 212	Calculus II	4
PHYS 231N	University Physics I	4
ENGN 150	Computer Programming for Engineering Problem Solving	4
	Credit Hours	17
Sophomore		
Fall		
MATH 307 or MATH 280	Ordinary Differential Equations (280) or Transfer Credit for Ordinary Differential Equations	3
ECE 201	Circuit Analysis I	3
ECE 241	Fundamentals of Computer Engineering	4
PHYS 232N	University Physics II	4
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research or Writing, Rhetoric, and Research: Special Topics	3
	Credit Hours	17

Spring			
ECE 202	•	Circuit Analysis II	3
ECE 287		Fundamental Electric Circuit Laboratory	2
CS 251 or CS 250	1	Programming with Java or Programming with C++	4
CS 252		Introduction to Unix for Programmers	1
CS 381		Introduction to Discrete Structures	3
Literature Way of Kn	owing		3
	(	Credit Hours	16
Junior			
Fall			
ECE 302	1	Linear System Analysis	3
ECE 313	1	Electronic Circuits	4
ECE 341	I	Digital System Design	3
CS 361	1	Data Structures and Algorithms	3
Human Creativity Wa	y of Knowin	g	3
	(	Credit Hours	16
Spring			
ECE 304		Probability, Statistics, and Reliability	3
ECE 346	1	Microcontrollers	3
ECE 381		Introduction to Discrete-time Signal Processing	3
CS 350		Introduction to Software Engineering	3
Technical Elective **	*		3
	(	Credit Hours	15
Senior			
Fall			
ECE 484W		Computer Engineering Design I (grade of C or better required)	3
ECE 486		Preparatory ECE Senior Design II	2
ECE 443		Computer Architecture	3
Technical Elective **	*		3
ENMA 480		Ethics and Philosophy in Engineering Applications	3
Interpreting the Past	Way of Know	ring	3
		Credit Hours	17
Spring			
ECE 487	1	ECE Senior Design II	2
CS 471		Operating Systems	3
Technical Elective **	*		3
Technical Elective **	*		3
Human Behavior Wa	y of Knowing	7	3
		Credit Hours	14
	,	Total Credit Hours	128
*	language be require		ay
****	CHEM I	20 is for online program students only.	

Course

Computer Engineering major students need four technical elective courses selected from one of three options: (1) four 400-level ECE technical elective courses; (2) three 400-level ECE technical elective courses and one 300-level ECE technical elective course or one approved 300-or 400-level CS/MATH/Engineering course; (3) two 400-level ECE technical elective courses and one approved 300- or 400-level CS course and one approved 300- or 400-level CS/MATH/Engineering course.

Credit Hours

## Computer Engineering Major (BSCE) Dual Degree with Computer Science (BSCS)

Title

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 110	Explore Engineering and Technology	2
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N or CHEM 120	Foundations of Chemistry I Laboratory <sup>1</sup> or Foundations of Chemistry I Laboratory for Online Degree Programs	1
MATH 211	Calculus I	4
ENGL 110C	English Composition (grade of C or better required)	3
Human Creativity Way of Know	ving	3
	Credit Hours	16
Spring		
ECE 111	Information Literacy and Research for Electrical and Computer Engineering <sup>2</sup>	2
CHEM 123N	Foundations of Chemistry II Lecture	3
MATH 212	Calculus II	4
PHYS 231N	University Physics I	4
ENGN 150	Computer Programming for Engineering Problem Solving <sup>3</sup>	4
	Credit Hours	17
Sophomore		
Fall		
MATH 307 or MATH 280	Ordinary Differential Equations (280) or Transfer Credit for Ordinary Differential Equations	3
ECE 201	Circuit Analysis I	3
PHYS 232N	University Physics II	4
COMM 101R	Public Speaking	3
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research or Writing, Rhetoric, and Research: Special Topics	3
	Credit Hours	16
Spring		
ECE 202	Circuit Analysis II	3
ECE 287	Fundamental Electric Circuit Laboratory	2
CS 251 or CS 250	Programming with Java or Programming with C++	4

CS 252	Introduction to Unix for Programmers	1
CS 381	Introduction to Discrete Structures	3
Human Behavior Way of Know	ving	3
	Credit Hours	16
Junior		
Fall		
ECE 241	Fundamentals of Computer Engineering	4
ECE 302	Linear System Analysis	3
CS 330	Object-Oriented Design and Programming	3
CS 390	Introduction to Theoretical Computer Science	3
CS 315	Computer Science Undergraduate Colloquium	1
Literature Way of Knowing		3
	Credit Hours	17
Spring		
ECE 313	Electronic Circuits	4
ECE 341	Digital System Design	3
ECE 381	Introduction to Discrete-time Signal Processing	3
CS 361	Data Structures and Algorithms	3
CS 450 or CS 418	Database Concepts or Web Programming	3
	Credit Hours	16
Senior		
Fall		
MATH 316	Introductory Linear Algebra	3
ECE 304	Probability, Statistics, and Reliability <sup>4</sup>	3
CS 350	Introduction to Software Engineering	3
ENMA 480	Ethics and Philosophy in Engineering Applications <sup>5</sup>	3
ECE Technical Elective I		3
	Credit Hours	15
Spring		
ECE 346	Microcontrollers <sup>7</sup>	3
CS 417	Computational Methods and Software	3
CS 355	Principles of Programming Languages	3
CS Upper Level Elective I		3
Interpreting the Past Way of K	nowing	3
	Credit Hours	15
Fifth Year		
Fall		
Fall ECE 484W	Computer Engineering Design	3
	I Preparatory ECE Senior Design II	3
ECE 484W	I Preparatory ECE Senior Design II Computer Architecture <sup>8</sup>	
ECE 484W ECE 486	I Preparatory ECE Senior Design II	2

CS Upper Lev	el Elective II		3
	C	Credit Hours	14
Spring			
ECE 487	Е	CCE Senior Design II	2
CS 471	C	Operating Systems	3
CS 411W		rofessional Workforce Development II	3
CS Upper Lev	el Elective III		3
ECE Technica	l Elective II <sup>6</sup>		3
	C	Credit Hours	14
	Т	Cotal Credit Hours	156
1 2 3	be require CHEM 12 ECE 111 Computer requireme ENGN 15 Science co	20 is for online program students only and other ECE required courses satisf a Science Information Literacy & Research of CS 121G.  30 satisfies the CS 150 requirement in curriculum.  31 satisfies the STAT 330 requirement in curriculum.	fy the earch
<ul><li>5</li><li>6</li><li>7</li></ul>	Ethics req Computer with Com Technical	80 satisfies the Computer Science Phi juirement.  Engineering students pursuing the du puter Science have two remaining EC Elective courses. satisfies the CS 170 requirement in C	ual degree CE 400-level
8	Science co ECE 443	curriculum.  270 requirement in Curriculum.	•

The General Education requirements in information literacy and research, impact of technology, and philosophy and ethics are met through the major. The upper-division General Education requirement is met through a built-in minor in computer science and through the completion of a second major/degree.

Computer engineering and computer science majors must earn a grade of C or better in all 200-level ECE courses and all CS courses prior to taking the next course in the sequence.

Any ECE course registration issues are to be resolved with the ECE Academic Coordinator and Program Manager.

The five-year plan is a suggested curriculum to complete this degree program in five years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

# **Computer Engineering Major (BSCE) Dual Degree** with Cyber Operations Major (BS Cybersecurity)

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 110	Explore Engineering and Technology	2
CHEM 121N	Foundations of Chemistry I Lecture	3

CHEM 122N or CHEM 120	Foundations of Chemistry I Laboratory <sup>1</sup> or Foundations of Chemistry I Laboratory for Online Degree Programs	1
MATH 211	Calculus I	4
ENGL 110C	English Composition (grade of C or better required)	3
COMM 101R	Public Speaking	3
	Credit Hours	16
Spring		
ECE 111	Information Literacy and Research for Electrical and Computer Engineering <sup>2</sup>	2
CHEM 123N	Foundations of Chemistry II Lecture	3
MATH 212	Calculus II	4
PHYS 231N	University Physics I	4
ENGN 150	Computer Programming for Engineering Problem Solving <sup>3</sup>	4
Sophomore Fall	Credit Hours	17
MATH 307 or MATH 280	Ordinary Differential Equations (280) or Transfer Credit for Ordinary Differential Equations	3
ECE 201	Circuit Analysis I	3
ECE 241	Fundamentals of Computer Engineering	4
PHYS 232N	University Physics II	4
CYSE 200T	Cybersecurity, Technology, and Society	3
	Credit Hours	17
Spring	Circuit Analysis II	2
ECE 202 ECE 287	Circuit Analysis II  Fundamental Electric Circuit	3
ECE 207	Laboratory	2
CS 251 or CS 250	Programming with Java or Programming with C++	4
CS 252	Introduction to Unix for Programmers	1
CS 381	Introduction to Discrete Structures	3
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research or Writing, Rhetoric, and Research: Special Topics	3
	Credit Hours	16
Junior		
Fall		
ECE 302	Linear System Analysis	3
ECE 313	Electronic Circuits	4
ECE 341	Digital System Design	3
CS 361 CRJS 215S	Data Structures and Algorithms	3
or SOC 201S	Introduction to Criminology or Introduction to Sociology	
	Credit Hours	16

Literature Way of Knowing	3

Spring		
ECE 304	Probability, Statistics, and Reliability	3
ECE 346	Microcontrollers <sup>4</sup>	3
ECE 381	Introduction to Discrete-time Signal Processing	3
CS 350	Introduction to Software Engineering	3
ENMA 480	Ethics and Philosophy in Engineering Applications	3
	Credit Hours	15
Senior		
Fall		
ECE 484W	Computer Engineering Design I (grade of C or better required)	3
ECE 486	Preparatory ECE Senior Design II	2
ECE 443	Computer Architecture <sup>5</sup>	3
CYSE 301	Cybersecurity Techniques and Operations	3
ECE 355	Introduction to Networks and Data Communications <sup>6</sup>	3
	Credit Hours	14
Spring		
ECE 487	ECE Senior Design II	2
ECE 419	Cyber Physical System Security <sup>6</sup>	3
ECE 455	Network Engineering and Design <sup>6</sup>	3
CS 471	Operating Systems	3
CYSE 406 or CRJS 406	Cyber Law or Cyber Law	3
Interpreting the Past Way of	of Knowing	3
	Credit Hours	17
Fifth Year		
Fall		
ECE 416	Cyber Defense Fundamentals <sup>6</sup>	3
CYSE 425W	Cybersecurity Strategy and Policy	3
CS 467	Introduction to Reverse Software Engineering	3
ECE 470 or MSIM 470	Foundations of Cyber Security or Foundations of Cyber Security	3
Cyber Approved Program	Elective <sup>7</sup>	3
Human Creativity Way of	Knowing	3
Spring	Credit Hours	18
CS 390	Introduction to Theoretical Computer Science	3
CS 466	Principles and Practice of Cyber Defense	3
CYSE 368 or CYSE 494	Cybersecurity Internship or Entrepreneurship in Cybersecurity	3

Cybersecurity Ethics

PHIL 355E

Credit Hours		15
	Total Credit Hours	161
*	Does not include the University's General Education language and culture requirement. Additional hours	
1 2	be required.  CHEM 120 is for online program students only.  ECE 111 and other ECE required courses satisfy th	e Cyber
3	Operations Information Literacy & Research requirement in Cybron 150 satisfies the CS 150	
4	Operations curriculum. ECE 346 satisfies the CS 170 requirement in Cyber	r
5	Operations curriculum. ECE 443 satisfies the CS 270 requirement in Cyber	r
6	Operations curriculum.  These courses are required courses for the Cyber Operations curriculum & ECE Technical Electives	for
7	Computer Engineering curriculum.  Cyber Approval Program Elective remaining option CS 476, CYSE 407, ECE 483, and IT 417.	

The General Education requirements in information literacy and research, impact of technology, and philosophy and ethics are met through the major. The upper-division General Education requirement is met through a built-in minor in computer science and through the completion of a second major/degree.

Computer engineering and cyber operations majors must earn a grade of C or better in all 200-level ECE courses and all CS courses prior to taking the next course in the sequence.

Any ECE course registration issues are to be resolved with the ECE Academic Coordinator and Program Manager.

The five-year plan is a suggested curriculum to complete this degree program in five years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works

### Computer Engineering Major (BSCE) Dual Degree with Cybersecurity Major (BS Cybersecurity)

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 110	Explore Engineering and Technology	2
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N or CHEM 120	Foundations of Chemistry I Laboratory <sup>1</sup> or Foundations of Chemistry I Laboratory for Online Degree Programs	1
MATH 211	Calculus I	4
ENGL 110C	English Composition (grade of C or better required)	3
COMM 101R	Public Speaking	3
	Credit Hours	16
Spring		
ECE 111	Information Literacy and Research for Electrical and Computer Engineering <sup>2</sup>	2

CHEM 123N	Foundations of Chemistry II Lecture	3
MATH 212	Calculus II	4
PHYS 231N	University Physics I	4
ENGN 150	Computer Programming for Engineering Problem Solving	4
	Credit Hours	17
Sophomore		
Fall		
MATH 307 or MATH 280	Ordinary Differential Equations (280) or Transfer Credit for Ordinary Differential Equations	3
ECE 201	Circuit Analysis I	3
ECE 241	Fundamentals of Computer Engineering	4
PHYS 232N	University Physics II	4
CYSE 200T	Cybersecurity, Technology, and Society	3
	Credit Hours	17
Spring		
ECE 202	Circuit Analysis II	3
ECE 287	Fundamental Electric Circuit Laboratory	2
CS 251 or CS 250	Programming with Java or Programming with C++	4
CS 252	Introduction to Unix for Programmers	1
CS 381	Introduction to Discrete Structures	3
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research or Writing, Rhetoric, and Research: Special Topics	3
	Credit Hours	16
Junior		
Fall		
ECE 302	Linear System Analysis	3
ECE 313	Electronic Circuits	4
ECE 341	Digital System Design	3
CS 361	Data Structures and Algorithms	3
CYSE 250	Basic Cybersecurity Programming and Networking	3
	Credit Hours	16
Spring		
ECE 304	Probability, Statistics, and Reliability	3
ECE 346	Microcontrollers	3
ECE 381	Introduction to Discrete-time Signal Processing	3
CS 350	Introduction to Software Engineering	3
CYSE 201S		

ECE 452	
CYSE 301 Cybersecurity Techniques and Operations  Credit Hours  Spring ECE 487 ECE Senior Design II ECE 419 Cyber Physical System Security 4 ECE 455 Network Engineering and Design 4 CS 471 Operating Systems  CYSE 406 or CRIS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall ECE 416 Cyber Defense Fundamentals 4 CYSE 300 Introduction to Cybersecurity CS 462 Cybersecurity Fundamentals PHIL 355E Cybersecurity Ethics IDS 300W Interdisciplinary Theory and Concepts Human Creativity Way of Knowing  Credit Hours  Spring IDS 493 IDS Electronic Portfolio Project CYSE 494 Or CYSE 494 Cybersecurity Internship or Entrepreneurship in Cybersecurity CYSE 425W Or POLS 425W Or Opols 480 Ethics and Philosophy in Engineering Applications	: : : : : : : : : : : : : : : : : : :
CYSE 301 Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487 ECE Senior Design II  ECE 419 Cyber Physical System Security 4  ECE 455 Network Engineering and Design 4  CS 471 Operating Systems  CYSE 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416 Cyber Defense Fundamentals 4  CYSE 300 Introduction to Cybersecurity  CS 462 Cybersecurity Fundamentals  PHIL 355E Cybersecurity Fundamentals  Human Creativity Way of Knowing  Credit Hours  Spring  IDS 493 IDS Electronic Portfolio Project  CYSE 425W or Cybersecurity Strategy and Policy or Cybersecurity Strategy and Policy ENMA 480 Ethics and Philosophy in	
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security <sup>4</sup> ECE 455  Network Engineering and Design <sup>4</sup> CS 471  Operating Systems  CYSE 406  or CRIS 406  Or Cyber Law  or Cyber Law  Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416  Cyber Defense Fundamentals <sup>4</sup> CYSE 300  Introduction to Cybersecurity  CS 462  Cybersecurity Fundamentals  PHIL 355E  Cybersecurity Ethics  IDS 300W  Interdisciplinary Theory and Concepts  Human Creativity Way of Knowing  Credit Hours  Spring  IDS 493  IDS Electronic Portfolio Project  CYSE 368  or CYSE 494  or POLS 425W  Or POLS 425W  Or Oybersecurity Strategy and Policy or Cybersecurity Strategy  Or Cybersecurity Strategy	1
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security <sup>4</sup> ECE 455  Network Engineering and Design <sup>4</sup> CS 471  Operating Systems  CYSE 406  or CRJS 406  or CRJS 406  Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416  Cyber Defense Fundamentals <sup>4</sup> CYSE 300  Introduction to Cybersecurity  CS 462  Cybersecurity Fundamentals  PHIL 355E  Cybersecurity Ethics  IDS 300W  Interdisciplinary Theory and Concepts  Human Creativity Way of Knowing  Credit Hours  Spring  IDS 493  IDS Electronic Portfolio Project  CYSE 368  Or CYSE 494  Cybersecurity Internship or Entrepreneurship in	1
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security <sup>4</sup> ECE 455  Network Engineering and Design <sup>4</sup> CS 471  Operating Systems  CYSE 406 or CRJS 406 Or CRJS 406 Or CRJS 406  Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416  Cyber Defense Fundamentals <sup>4</sup> CYSE 300  Introduction to Cybersecurity  CS 462  Cybersecurity Fundamentals  PHIL 355E  Cybersecurity Ethics  IDS 300W  Interdisciplinary Theory and Concepts  Human Creativity Way of Knowing  Credit Hours  Spring  IDS 493  IDS Electronic Portfolio	1
CYSE 301 Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487 ECE Senior Design II  ECE 419 Cyber Physical System Security  ECE 455 Network Engineering and Design 4  CS 471 Operating Systems  CYSE 406 or CRJS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416 Cyber Defense Fundamentals  CYSE 300 Introduction to Cybersecurity  CS 462 Cybersecurity Fundamentals  PHIL 355E Cybersecurity Ethics  IDS 300W Interdisciplinary Theory and Concepts  Human Creativity Way of Knowing  Credit Hours  Credit Hours	1
CYSE 301 Cybersecurity Techniques and Operations  Credit Hours  Spring ECE 487 ECE Senior Design II ECE 419 Cyber Physical System Security 4 ECE 455 Network Engineering and Design 4 CS 471 Operating Systems  CYSE 406 or CRJS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall ECE 416 Cyber Defense Fundamentals 4 CYSE 300 Introduction to Cybersecurity CS 462 Cybersecurity Fundamentals PHIL 355E Cybersecurity Ethics IDS 300W Interdiction Interdiction of Concepts Human Creativity Way of Knowing	1
CYSE 301 Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487 ECE Senior Design II  ECE 419 Cyber Physical System Security 4  ECE 455 Network Engineering and Design 4  CS 471 Operating Systems  CYSE 406 or CRIS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416 Cyber Defense Fundamentals 4  CYSE 300 Introduction to Cybersecurity  CS 462 Cybersecurity Ethics IDS 300W Interdisciplinary Theory and Concepts	1
CYSE 301 Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487 ECE Senior Design II  ECE 419 Cyber Physical System Security  ECE 455 Network Engineering and Design 4  CS 471 Operating Systems  CYSE 406 or CRJS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416 Cyber Defense Fundamentals  CYSE 300 Introduction to Cybersecurity  CS 462 Cybersecurity Ethics  IDS 300W Interdisciplinary Theory and	1
CYSE 301 Cybersecurity Techniques and Operations  Credit Hours  Spring ECE 487 ECE Senior Design II ECE 419 Cyber Physical System Security  ECE 455 Network Engineering and Design  CS 471 Operating Systems  CYSE 406 or CRJS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall ECE 416 Cyber Defense Fundamentals  CYSE 300 Introduction to Cybersecurity CS 462 Cybersecurity Fundamentals	,
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security 4  ECE 455  Network Engineering and Design 4  CS 471  Operating Systems  CYSE 406 or CRJS 406 Or CRJS 406 Or CRJS 406 Or CRJS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416  Cyber Defense Fundamentals 4  CYSE 300  Introduction to Cybersecurity	1
CYSE 301 Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487 ECE Senior Design II  ECE 419 Cyber Physical System Security 4  ECE 455 Network Engineering and Design 4  CS 471 Operating Systems  CYSE 406 or CRJS 406 Or CRJS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall  ECE 416 Cyber Defense Fundamentals 4	1
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security 4  ECE 455  Network Engineering and Design 4  CS 471  Operating Systems  CYSE 406 or CRJS 406 or CRJS 406 Or CRJS 406 Or CRJS 406 Interpreting the Past Way of Knowing  Credit Hours  Fifth Year  Fall	1
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security 4  ECE 455  Network Engineering and Design 4  CS 471  Operating Systems  CYSE 406 or CRJS 406 or CRJS 406 Or CRJS 406 Cyber Law or Cyber Law Interpreting the Past Way of Knowing  Credit Hours  Fifth Year	1
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security <sup>4</sup> ECE 455  Network Engineering and Design <sup>4</sup> CS 471  Operating Systems  CYSE 406 or CRJS 406 Or CRJS 406 Or CRJS 406 Interpreting the Past Way of Knowing	1
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security 4  ECE 455  Network Engineering and Design 4  CS 471  Operating Systems  CYSE 406 or CRJS 406 Or CRJS 406 Or CRJS 406  Cyber Law Or Cyber Law Or Cyber Law	
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security <sup>4</sup> ECE 455  Network Engineering and Design <sup>4</sup> CS 471  Operating Systems  CYSE 406  Cyber Law	
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security 4  ECE 455  Network Engineering and Design 4	
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System Security 4  ECE 455  Network Engineering and	
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring  ECE 487  ECE Senior Design II  ECE 419  Cyber Physical System	
CYSE 301  Cybersecurity Techniques and Operations  Credit Hours  Spring	
CYSE 301 Cybersecurity Techniques and Operations	
Cybersecurity Techniques and	]
ECE 452	
ECE 355 Introduction to Networks and Data Communications	
ECE 443 Computer Architecture	
ECE 486 Preparatory ECE Senior Design II	
ECE 484W Computer Engineering Design I (grade of C or better required)	
Fall	
Senior	
Sociology Credit Hours	:
or SOC 201S (Human Behavior Way of Knowing) <sup>3</sup> or Introduction to	

*	Does not include the University's General Education
	language and culture requirement. Additional hours may
	be required.
1	CHEM 120 is for online program students only.
2	ECE 111 satisfies the Cybersecurity Information Literacy
	& Research requirement.
3	CRJS 215S or SOC 201S satisfies the University's Human
	Behavior Way of Knowing requirement.
4	These courses are required courses for Cybersecurity
	curriculum (satisfying 2 Principles & 2 Application
	Courses) & ECE Technical Electives for Computer
	Engineering curriculum.

The General Education requirements in information literacy and research, impact of technology, and philosophy and ethics are met through the major. The upper-division General Education requirement is met through a built-in minor in computer science and through the completion of a second major/degree.

Computer engineering and cybersecurity majors must earn a grade of C or better in all 200-level ECE courses and all CS courses prior to taking the next course in the sequence.

Any ECE course registration issues are to be resolved with the ECE Academic Coordinator and Program Manager.

The five-year plan is a suggested curriculum to complete this degree program in five years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

### Electrical Engineering (BSEE) Dual Major/Degree with Computer Engineering Major (BSCE)

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 110	Explore Engineering and Technology	2
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N or CHEM 120	Foundations of Chemistry I Laboratory** or Foundations of Chemistry I Laboratory for Online Degree Programs	1
MATH 211	Calculus I	4
ENGL 110C	English Composition	3
COMM 101R	Dublic Caseline	3
COMM TOTA	Public Speaking	3
COWN TOTA	Credit Hours	16
Spring		
Spring	Credit Hours  Information Literacy and Research for Electrical and	16
Spring ECE 111	Credit Hours  Information Literacy and Research for Electrical and Computer Engineering Foundations of Chemistry II	16
Spring ECE 111 CHEM 123N	Credit Hours  Information Literacy and Research for Electrical and Computer Engineering Foundations of Chemistry II Lecture	2
Spring ECE 111 CHEM 123N MATH 212	Credit Hours  Information Literacy and Research for Electrical and Computer Engineering  Foundations of Chemistry II Lecture  Calculus II  Computer Programming for	2 3 4

#### Sophomore

#### Fall

3.6 A TOTAL 2007		
MATH 307 or MATH 280	Ordinary Differential Equations or Transfer Credit for Ordinary Differential Equations	3
ECE 201	Circuit Analysis I	3
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research or Writing, Rhetoric, and Research: Special Topics	3
PHYS 232N	University Physics II	4
CS 381	Introduction to Discrete Structures	3
Human Creativity Way of Know	ing	3
	Credit Hours	19
Spring		
ECE 202	Circuit Analysis II	3
ECE 287	Fundamental Electric Circuit Laboratory	2
ECE 241	Fundamentals of Computer Engineering	4
CS 251 or CS 250	Programming with Java or Programming with C++	4
CS 252	Introduction to Unix for Programmers	1
MATH 312 or MATH 285	Calculus III or Transfer Credit for Calculus III	4
	Credit Hours	18
Junior		
Fall		
ECE 302	Linear System Analysis	3
ECE 303	Introduction to Electrical Power	3
ECE 313	Electronic Circuits	4
ECE 341	Digital System Design	3
Interpreting the Past Way of Kno	owing	3
	Credit Hours	
		16
Spring		16
Spring ECE 304	Probability, Statistics, and Reliability	3
ECE 304	Reliability	3
ECE 304 ECE 323	Reliability  Electromagnetics	3
ECE 304  ECE 323  ECE 346	Reliability Electromagnetics Microcontrollers Introduction to Discrete-time	3 3 3
ECE 304  ECE 323  ECE 346  ECE 381	Reliability  Electromagnetics  Microcontrollers  Introduction to Discrete-time Signal Processing	3 3 3
ECE 304  ECE 323  ECE 346  ECE 381  CS 361	Reliability  Electromagnetics  Microcontrollers  Introduction to Discrete-time Signal Processing  Data Structures and Algorithms  Ethics and Philosophy in	3 3 3 3
ECE 304  ECE 323  ECE 346  ECE 381  CS 361	Reliability  Electromagnetics  Microcontrollers  Introduction to Discrete-time Signal Processing  Data Structures and Algorithms  Ethics and Philosophy in Engineering Applications	3 3 3 3 3
ECE 304  ECE 323  ECE 346  ECE 381  CS 361  ENMA 480	Reliability  Electromagnetics  Microcontrollers  Introduction to Discrete-time Signal Processing  Data Structures and Algorithms  Ethics and Philosophy in Engineering Applications	3 3 3 3 3
ECE 304  ECE 323  ECE 346  ECE 381  CS 361  ENMA 480	Reliability  Electromagnetics  Microcontrollers  Introduction to Discrete-time Signal Processing  Data Structures and Algorithms  Ethics and Philosophy in Engineering Applications	3 3 3 3 3
ECE 304  ECE 323  ECE 346  ECE 381  CS 361  ENMA 480  Senior  Fall	Reliability  Electromagnetics  Microcontrollers  Introduction to Discrete-time Signal Processing  Data Structures and Algorithms  Ethics and Philosophy in Engineering Applications  Credit Hours  Computer Engineering Design	3 3 3 3 3 3

ECE 443	Computer Architecture	3
ECE 332	Microelectronic Materials and Processes	3
Literature Way of Kno	owing	3
	Credit Hours	17
Spring		
ECE 487	ECE Senior Design II	2
CS 350	Introduction to Software Engineering	3
CS 471	Operating Systems	3
ECE 387	Microelectronics Fabrication Laboratory	3
Technical Elective ***	*	3
Human Behavior Way	y of Knowing	3
	Credit Hours	17
	Total Credit Hours	138
* **	Does not include the University's General Education language and culture requirement. Additional hours be required.  CHEM 120 is for online program students only.	
***	Electrical & Computer Engineering students pursuin double major/degree need their final technical electrical	_

The General Education requirements in information literacy and research, impact of technology, and philosophy and ethics are met through the major. The upper-division General Education requirement is met through a built-in minor in computer science and through the completion of a second major/degree.

course to be a 400-level ECE technical elective course.

Electrical & Computer engineering majors must earn a grade of C or better in all 200-level ECE courses and all CS courses prior to taking the next course in the sequence.

Any ECE course registration issues are to be resolved with the ECE Academic Coordinator and Program Manager.

The five-year plan is a suggested curriculum to complete this degree program in five years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

Students seeking two degrees must complete a minimum of 150 credit hours.

#### Modeling & Simulation Engineering Major (BSCE) Dual Degree with Computer Science (BSCS)

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 110	Explore Engineering and Technology	2
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N or CHEM 120	Foundations of Chemistry I Laboratory <sup>1</sup> or Foundations of Chemistry I Laboratory for Online Degree Programs	1
MATH 211	Calculus I	4
ENGL 110C	English Composition (grade of C or better required)	3

Human Creativity Way of I		:
Spring	Credit Hours	10
ECE 111	Information Literacy and Research for Electrical and Computer Engineering <sup>2</sup>	
CHEM 123N	Foundations of Chemistry II Lecture	
MATH 212	Calculus II	
PHYS 231N	University Physics I	
ENGN 150	Computer Programming for Engineering Problem Solving <sup>3</sup>	
	Credit Hours	1
Sophomore		
Fall		
MATH 307 or MATH 280	Ordinary Differential Equations (280) or Transfer Credit for Ordinary Differential Equations	
ECE 201	Circuit Analysis I	
PHYS 232N	University Physics II	
COMM 101R	Public Speaking	
ENGL 211C	Writing, Rhetoric, and	
or ENGL 231C	Research or Writing, Rhetoric, and Research: Special Topics	
	Credit Hours	1
Spring		
ECE 202	Circuit Analysis II	
ECE 287	Fundamental Electric Circuit Laboratory	
CS 251 or CS 250	Programming with Java or Programming with C++	
CS 252	Introduction to Unix for Programmers	
CS 381	Introduction to Discrete Structures	
Human Behavior Way of K	nowing	
	Credit Hours	1
Junior		
Fall		
ECE 241	Fundamentals of Computer Engineering	
ECE 302	Linear System Analysis	
CS 330	Object-Oriented Design and Programming	
CS 390	Introduction to Theoretical Computer Science	
CS 315	Computer Science Undergraduate Colloquium	
Literature Way of Knowing	5	
Spring	Credit Hours	1
ECE 313	Electronic Circuits	
ECE 341	Digital System Design	
ECE 304		
LCL JUT	Probability, Statistics, and	
	Reliability <sup>4</sup>	

CS 361	Data Structures and Algorithms	3
CS 450 or CS 418	Database Concepts or Web Programming	3
	Credit Hours	16
Senior		
Fall		
MATH 316	Introductory Linear Algebra	3
ECE 306	Discrete System Modeling and Simulation	3
CS 350	Introduction to Software Engineering	3
ENMA 480	Ethics and Philosophy in Engineering Applications <sup>5</sup>	3
ECE Technical Elective I <sup>6</sup>		3
	Credit Hours	15
Spring		
ECE 320	Continuous System Modeling and Simulation	3
ECE 346	Microcontrollers <sup>7</sup>	3
ECE 348	Simulation Software Design	3
CS 417	Computational Methods and Software	3
CS 355	Principles of Programming Languages	3
CS Upper Level Elective I		3
	Credit Hours	18
Fifth Year		
Fall		
ECE 406	Computer Graphics and Visualization	3
ECE 443	Computer Architecture <sup>8</sup>	3
ECE 484W	Computer Engineering Design I	3
ECE 486	Preparatory ECE Senior Design	2
CS 410	Professional Workforce Development I	3
CS Upper Level Elective II		3
	Credit Hours	17
Spring		
ECE 487	ECE Senior Design II	2
CS 471	Operating Systems	3
CS 411W	Professional Workforce Development II	3
CS Upper Level Elective III		3
Interpreting the Past Way of Ki	nowing	3
	Credit Hours	14
	Total Credit Hours	162

Does not include the University's General Education language and culture requirement. Additional hours may be required.

CHEM 120 is for online program students only.

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ECE 111 and other ECE required courses satisfy the Computer Science Information Literacy & Research requirement of CS 121G.

3	ENGN 150 satisfies the CS 150 requirement in Computer Science curriculum.
4	ECE 304 satisfies the STAT 330 requirement in Computer Science curriculum
5	ENMA 480 satisfies the Computer Science Philosophy &
6	Ethics requirement.  Computer Engineering - Modeling & Simulation  Engineering Major students pursuing the dual degree with
	Computer Science have one remaining ECE 400-level
7	Technical Elective course.  ECE 346 satisfies the CS 170 requirement in Computer
8	Science curriculum. ECE 443 satisfies the CS 270 requirement in Computer
	Science curriculum.

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The five-year plan is a suggested curriculum to complete this degree program in five years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.