Computer Science, B.S.C.S.

Degree Offered

• Bachelor of Science in Computer Science (B.S.C.S.)

Nature of the Program

Computer science is a discipline that involves the understanding and design of computational processes. The discipline ranges from a theoretical study of algorithms and information processing in general, to a practical design of efficient and reliable software that meets given specifications. This differs from most physical sciences, engineering included, that separate theoretical underpinnings of the science from applications within it. The computer science major prepares students for careers in fields such as software development, cybersecurity, machine learning, data analytics, virtual reality, and human computer interfaces. The Bachelor of Science degree in Computer Science is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org, under the General Criteria and the Program Criteria for Computer Science.

Program Educational Objectives

The Program Educational Objectives (PEO) of the Bachelor of Science in Computer Science (B.S.C.S.) program at West Virginia University is to produce graduates who will apply their knowledge and skills to achieve success in their careers in industry, research, government service or graduate study. It is expected that in the first five years after graduation our graduate will achieve success and proficiency in their profession, be recognized as leaders, and contribute to the well-being of society.

Click here to view the Suggested Plan of Study (p. 3)

Curriculum in Computer Science

General Education Foundations

Please use this link to view a list of courses that meet each GEF requirement. (http://registrar.wvu.edu/gef/)

NOTE: Some major requirements will fulfill specific GEF requirements. Please see the curriculum requirements listed below for details on which GEFs you will need to select.

Code	Title	Hours
General Education Foundations		
F1 - Composition & Rhetoric		3-6
ENGL 101 & ENGL 102 or ENGL 103	Introduction to Composition and Rhetoric and Composition, Rhetoric, and Research Accelerated Academic Writing	
F2A/F2B - Science & Technology		4-6
F3 - Math & Quantitative Reasoning		3-4
F4 - Society & Connections		3
F5 - Human Inquiry & the Past		3
F6 - The Arts & Creativity		3
F7 - Global Studies & Diversity		3
F8 - Focus (may be satisfied by com	pletion of a minor, double major, or dual degree)	9
Total Hours		31-37

Please note that not all of the GEF courses are offered at all campuses. Students should consult with their advisor or academic department regarding the GEF course offerings available at their campus.

Degree Requirements

Students must meet the following criteria to qualify for a Bachelor of Science in Computer Science degree:

- · Complete a minimum of 122 credit hours
- · Satisfy WVU's undergraduate degree requirements
- Satisfy Statler College's undergraduate degree requirements (http://catalog.wvu.edu/undergraduate/collegeofengineeringandmineralresources/ #policiestext)
- · Complete all courses listed in the curriculum requirements with the required minimum grades
- · Attain an overall grade point average of 2.00 or better

- Attain a WVU grade point average of 2.00 or better
- Attain a Statler grade point average of 2.00 or better
- A maximum of one math or science courses with a grade of D+, D, or D- may apply towards a Statler College degree
- Complete a survey regarding their academic and professional experiences at WVU, as well as post-graduation job placement or continuing education plans.

The Statler GPA is computed based on all work taken at WVU with a subject code within Statler College (BIOM, BMEG, CE, CHE, CPE, CS, CSEE, CYBE, EE, ENGR, ENVE, ETEC, IENG, IH&S, MAE, MINE, PDA, PNGE, ROBE, SAFM, SENG) excluding ENGR 140, ENGR 150, and CS 101. The WVU GPA is computed based on all work taken at WVU. The Overall GPA is computed based on all work taken at WVU and transfer work.

Curriculum Requirements

Code	Title	Hours
University Requirements		19
Fundamentals of Engineering	Requirements	2
Math and Science Requirement	ts	28
Computer Science Program R	equirements	73
Total Hours		122

University Requirements

Code	Title	Hours
General Education Fo	undations (GEF) 1, 2, 3, 4, 5, 6, 7, and 8 (31-37 Cre	dits)
Outstanding GEF Rec	uirements 1, 4, 5, 6, and 7	18
ENGR 191	First-Year Seminar	1
Total Hours		19

Fundamentals of Engineering Requirements

Code	Title	Hours
A minimum grade of C-	is required in all Fundamentals of Engineering courses.	
ENGR 101	Engineering Problem Solving 1	2
Total Hours		2

Math and Science Requirements

Code	Title	Hours
A minimum grade of C- is required in	all Math and Science courses except CS 220, MATH 303, and MATH 378.	
Core Requirements		
MATH 155	Calculus 1 (GEF 3)	4
MATH 156	Calculus 2 (GEF 8)	4
STAT 215	Introduction to Probability and Statistics (GEF 8)	3
Lab Science Electives I (GEF 2B) & I	(GEF 8): Select two GEF 2B courses and accompanying labs	8
Math and Statistics Elective: Select o	ne MATH course numbered 251 or higher or STAT course numbered 300 or higher	3
Discrete Mathematics Requirement	: Select one option from below:	6
Option A		
CS 220	Discrete Mathematics	
Elective: Select one additional MA	TH course numbered 251 or higher or STAT course numbered 300 or higher	
Option B		
MATH 303	Introduction to the Concepts of Mathematics	
MATH 378	Discrete Mathematics	

Total Hours

Computer Science Program Requirements

Code	Title	Hours
A minimum grade of C- is required in	CS 110, CS 110L, CS 111, and CS 111L.	
CS 110	Introduction to Computer Science	4
& 110L	and Introduction to Computer Science Laboratory	
CS 111	Introduction to Data Structures	4
& 111L	and Introduction to Data Structures Laboratory	
CS 210	File and Data Structures	4
CS 310	Principles of Programming Languages	3
CS 320	Analysis of Algorithms	3
CS 330	Introduction to Software Engineering	4
& 330L	and Introduction to Software Engineering Laboratory	
CS 350	Computer System Concepts	3
CS 410	Compiler Construction	3
or CS 422	Automata Theory	
CS 450	Operating Systems Structure	4
CPE 271	Introduction to Digital Logic Design	4
& 271L	and Digital Logic Laboratory	
CPE 310	Microprocessor Systems	3
CPE 453	Data and Computer Communications	3
CSEE 380	Engineering for Societal Impact	2
CSEE 480S	Capstone Project - Design	2
or CSEE 480	Capstone Project - Design	
CSEE 481S	Capstone Project - Implementation	3
or CSEE 481	Capstone Project - Implementation	
WRIT 304	Business and Professional Writing	3
or WRIT 305	Technical Writing	
or WRIT 403	Grant Proposal Writing for Community & Industry	
Free Elective ^{*, **, ***}		3
CS Elective **, ***		3
400-level or higher course in CS su	ubject code	
Interdisciplinary Technical Electives *,	** *** 3 1	12
300-level or higher courses in BIOI	M, CPE, CS, CSEE, CYBE, EE, or ROBE subject codes	
ART 386S	Gaming Design and Digital Narrative	
PHYS 351	Introduction to Quantum Computing	
Statler College Elective		3
Course offered by Statler College		
Total Hours		73

*

Students choosing an AOE in Cybersecurity are not required to fulfill the Free Elective requirement and must choose only a total of 3 credits from Interdisciplinary Technical Electives.

**

A maximum of 3 credits from any applicable 490 course may be used toward elective requirements.

A maximum of 3 credits from any applicable 491 course may be used toward elective requirements.

Suggested Plan of Study

It is important for students to take courses in the order specified as closely as possible; all prerequisites and concurrent requirements must be observed. A typical B.S. degree program that completes degree requirements in four years is as follows.

First Year			
Fall	Hours	Spring	Hours
CS 110		4 CS 111	4
& 110L		& 111L	
ENGR 101		2 ENGL 101 (GEF 1)	3
ENGR 191		1 MATH 156 (GEF 8)	4
MATH 155 (GEF 3)		4 Lab Science Elective II (GEF 8)	4
Lab Science Elective I (GEF 2B)		4	
		15	15
Second Year			
Fall	Hours	Spring	Hours
CS 210		4 CPE 271	4
		& 271L	
CS 330		4 STAT 215 (GEF 8)	3
& 330L			
ENGL 102 (GEF 1)		3 GEF 5	3
GEF 4		3 GEF 6	3
Discrete Mathematics Requirement Course		3 Discrete Mathematics Requirement Course	3
		17	16
Third Year			
Fall	Hours	Spring	Hours
CS 310		3 CPE 310	3
CS 320		3 CSEE 380	2
CS 350		3 Interdisciplinary Technical Elective	3
WRIT 304, 305, or 403		3 Interdisciplinary Technical Elective	3
Interdisciplinary Technical Elective		3 Math and Statistics Elective	3
		15	14
Fourth Year			
Fall	Hours	Spring	Hours
CS 410 or 422		3 CSEE 481S	3
CS 450		4 Interdisciplinary Technical Elective	3
CPE 453		3 CS Elective	3
CSEE 480S		2 Free Elective	3
GEF 7		3 Statler College Elective	3
		15	15

Total credit hours: 122

Areas of Emphasis

- Artificial Intelligence
- Cybersecurity

AREA OF EMPHASIS IN ARTIFICIAL INTELLIGENCE

Code	Title	Hours
CS 472	Artificial Intelligence	3
CS 474	Introduction to Responsible and Safe AI	3
Select two of the follow	ving:	6
CPE 420	Introduction to Neural Networks	
CS 460	Introduction to Big Data Engineering	
CS 473	Introduction to Data Mining	
CS 476S	Applied Artificial Intelligence Studio	
EE 465	Introduction to Digital Image Processing	
Total Hours		12

AREA OF EMPHASIS IN CYBERSECURITY

Code	Title	Hours
CPE 453	Data and Computer Communications	3
CYBE 366	Secure Software Development	3
CYBE 465	Cybersecurity Principles and Practice	3
CYBE 467	Ethical Hacking & Penetration Testing	3
Select one of the following	g:	3
CYBE 435	Computer Incident Response	
CYBE 466	Host Based Cyber Defense	
Total Hours		15

Total Hours

Dual Degree Programs

- Lane Department Programs (p. 5)
- B.S.C.S. Computer Science and B.S. Robotics Engineering (p. 5)

Lane Department Programs

Students can simultaneously pursue two bachelor's degrees in the Lane Department. To successfully complete both degrees, students must meet all requirements of both programs and complete a minimum of 150 credit hours. As part of those 150 credit hours, 30 credit hours must be unique from the primary degree course requirements. Exact credit hours and classes will vary per student based on their choice of technical electives and emphasis courses.

The most common Lane Department major combinations are:

- Computer Engineering and Electrical Engineering
- Computer Engineering and Computer Science

Please refer to the catalog descriptions of each individual program for course and academic requirements which can include minimum grades and GPA, and elective choices.

B.S.C.S. Computer Science and B.S. Robotics Engineering

Degree Requirements

Students must meet the following criteria to qualify for a Bachelor of Science in Computer Science and a Bachelor of Science in Robotics Engineering degree:

- · Complete a minimum of 152 credit hours
- · Satisfy WVU's undergraduate degree requirements
- Satisfy Statler College's undergraduate degree requirements (http://catalog.wvu.edu/undergraduate/collegeofengineeringandmineralresources/ #policiestext)
- · Complete all courses listed in the curriculum requirements with the required minimum grades
- · Attain an overall grade point average of 2.00 or better
- · Attain a WVU grade point average of 2.00 or better
- Attain a Statler grade point average of 2.00 or better
- A maximum of one math or science courses with a grade of D+, D, or D- may apply towards a Statler College degree
- · Complete a survey regarding their academic and professional experiences at WVU, as well as post-graduation job placement or continuing education plans.

The Statler GPA is computed based on all work taken at WVU with a subject code within Statler College (BIOM, BMEG, CE, CHE, CPE, CS, CSEE, CYBE, EE, EMGT, ENGR, ENVE, ETEC, IENG, IH&S, MAE, MINE, MPGE, MSEN, PDA, PNGE, ROBE, SAFM, SENG) excluding ENGR 140, ENGR 150, and CS 101. The WVU GPA is computed based on all work taken at WVU. The Overall GPA is computed based on all work taken at WVU and transfer work.

Curriculum Requirements

Code	Title	Hours
University Requirements		16
Fundamentals of Engineering Requir	ments	2

Math and Science Requirements	30
Computer Science and Robotics Engineering Program Requirements	104-105
Total Hours	152-153

University Requirements

Code	Title		Hours
General Education Four	ndations (GEF) 1, 2, 3, 4, 5, 6, 7, a	d 8 (31-37 Credits)	
Outstanding GEF Requ	irements 1, 5, 6, and 7		15
ENGR 191	First-Year Seminar		1
Total Hours			16

Fundamentals of Engineering Requirements

Code	Title	Hours
A minimum grade of C	- is required in all Fundamentals of Engineering courses.	
ENGR 101	Engineering Problem Solving 1	2
Total Hours		2

Total Hours

Math and Science Requirements

Code	Title	Hours
A minimum grade of C- is requi	ired in all Math and Science courses except CS 220.	
CS 220	Discrete Mathematics	3
MATH 155	Calculus 1 (GEF 3)	4
MATH 156	Calculus 2 (GEF 8)	4
MATH 251	Multivariable Calculus	4
MATH 261	Elementary Differential Equations	4
PHYS 111 & 111L	General Physics 1 and General Physics 1 Laboratory (GEF 2B)	4
PHYS 112 & 112L	General Physics 2 and General Physics 2 Laboratory (GEF 8)	4
STAT 215	Introduction to Probability and Statistics (GEF 8)	3
Total Hours		30

Computer Science and Robotics Engineering Program Requirements

Code	Title	Hours
CPE 271 & 271L	Introduction to Digital Logic Design and Digital Logic Laboratory	4
CPE 310 & 310L	Microprocessor Systems and Microprocessor Systems Laboratory	4
CPE 453	Data and Computer Communications	3
CS 110 & 110L	Introduction to Computer Science and Introduction to Computer Science Laboratory	4
CS 111	Introduction to Data Structures	4
& 111L	and Introduction to Data Structures Laboratory	
CS 210	File and Data Structures	4
CS 310	Principles of Programming Languages	3
CS 320	Analysis of Algorithms	3
CS 330 & 330L	Introduction to Software Engineering and Introduction to Software Engineering Laboratory	4
CS 350	Computer System Concepts	3
CS 410	Compiler Construction	3
or CS 422	Automata Theory	
CS 450	Operating Systems Structure	4

EE 221 Introduction to Electrical Engineering Laboratory 4 & 221L and Introduction to Electrical Engineering Laboratory 4 & 251L and Digital Electronics 4 & 251L and Digital Electronics Laboratory 1 MAE 202 Sophomore Seminar 1 MAE 211 Mechatronics Laboratory 1 MAE 212L Introduction to Computer Aided Design 1 MAE 242 Dynamics 3 MAE 243 Mechatronics Laboratory 3 MAE 242 Dynamics 3 MAE 243 Mechatronics Laboratory 3 MAE 244 Dynamics of Materials 3 MAE 245 Dynamics of Materials 3 MAE 342 Dynamics of Machines 3 MAE 342 Dynamics of Machines 3 MAE 440 Automatic Controls 3 ROBE 313 Fundamentals of Robotic Systems 3 ROBE 412 Mobile Robotics 3 ROBE 414 Robot Autonany 3 ROBE 413 Grant Proposal Writing for Community & Industry 3 ROT WRIT	ECON 201	Principles of Microeconomics	3
EE 251Digital Electronics4& 2511and Digital Electronics Laboratory1MAE 202Sophomore Seminar1MAE 211Mechatronics3& 2111and Mechatronics Laboratory1MAE 212LIntroduction to Computer Aided Design1MAE 241Statics3MAE 242Dynamics3MAE 243Mechanics of Materials3MAE 342Dynamics of Materials3MAE 342Dynamics of Machines3MAE 342Dynamics of Machines3MAE 440Advanced Mechatronics Laboratory3MAE 440Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3or WRIT 304Business and Professional Writing3or WRIT 305Technical Writing for Community & Industry6-7CSEE 380Engineering for Societal Impact & CSEE 480S & and Capstone Project - Design6-7ROBE 471SPriorites of Forineering Terrines of Forineering	EE 221 & 221L	Introduction to Electrical Engineering and Introduction to Electrical Engineering Laboratory	4
MAE 202Sophomore Seminar1MAE 201Mechatronics3& 211.1and Mechatronics Laboratory3MAE 212.LIntroduction to Computer Aided Design1MAE 214Statics3MAE 241Statics3MAE 242Dynamics3MAE 316Analysis of Engineering Systems3MAE 342Dynamics of Materials3MAE 342Dynamics of Machines3MAE 411Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robotic Manipulators3or WRIT 305Technical Writing3or WRIT 305Technical Writing for Community & Industry6-7CSEE 380Engineering for Societal Impact & CSEE 481Sand Capstone Project - Design Ber for and Capstone Project - Design & CSEE 481SPrinciples of Lengineering Design	EE 251 & 251L	Digital Electronics and Digital Electronics Laboratory	4
MAE 211Mechatronics and Mechatronics Laboratory3MAE 211Land Mechatronics Laboratory1MAE 212LIntroduction to Computer Aided Design1MAE 241Statics3MAE 242Dynamics3MAE 243Mechanics of Materials3MAE 316Analysis of Engineering Systems3MAE 342Dynamics of Machines3MAE 341Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing or WRIT 3057echnical Writing for Community & IndustryCapstone Design Sequence6-7CSEE 380Engineering for Societal Impact and Capstone Project - Design & CSEE 481SEngineering Design DesignROBE 471SPrinciples of Engineering Design DesignMacting Design DesignROBE 471SPrinciples of Engineering Design80	MAE 202	Sophomore Seminar	1
MAE 212LIntroduction to Computer Aided Design1MAE 241Statics3MAE 242Dynamics3MAE 243Mechanics of Materials3MAE 316Analysis of Engineering Systems3MAE 316Analysis of Engineering Systems3MAE 342Dynamics of Machines3MAE 341Advanced Mechatronics3MAE 411Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Roboti Annipulators3ROBE 414Robot Autonomy3or WRIT 304Business and Professional Writing3or WRIT 305Technical Writing or WRIT 305Technical Writing for Community & IndustryCapstone Design Sequence6-7CSEE 380Engineering for Societal Impact & CSEE 4805 & and Capstone Project - Design & CSEE 4815 & and Capstone Project - DesignROBE 471SPrinciples of Engineering Design 5	MAE 211 & 211L	Mechatronics and Mechatronics Laboratory	3
MAE 241Statics3MAE 242Dynamics3MAE 243Mechanics of Materials3MAE 316Analysis of Engineering Systems3MAE 342Dynamics of Machines3MAE 411Advanced Mechatronics3A4111Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robtic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing or WRIT 3053or WRIT 305Technical Writing for Community & Industry3CAPSE 480S & CSEE 480S & CSEE 480S & CSEE 481SEngineering for Societal Impact and Capstone Project - Design & CSEE 481S6ROBE 471SPrincriples of Engineering Design8	MAE 212L	Introduction to Computer Aided Design	1
MAE 242Dynamics3MAE 243Mechanics of Materials3MAE 316Analysis of Engineering Systems3MAE 316Analysis of Machines3MAE 342Dynamics of Machines3MAE 411Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing or WRIT 3053or WRIT 403Grant Proposal Writing for Community & Industry6-7CSEE 380 & CSEE 480S & and Capstone Project - Design & CSEE 480S & and Capstone Project - Design6-7ROBE 471SPrinciples of Engineering for Societal Impact & CSEE 480S & and Capstone Project - Design6-7	MAE 241	Statics	3
MAE 243Mechanics of Materials3MAE 316Analysis of Engineering Systems3MAE 342Dynamics of Machines3MAE 411Advanced Mechatronics3& 411Land Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing3or WRIT 305Technical Writing for Community & Industry67CSEE 380Engineering for Societal Impact & CSEE 480S and Capstone Project - Design67ROBE 471SPrinciples of Engineering Design7	MAE 242	Dynamics	3
MAE 316Analysis of Engineering Systems3MAE 342Dynamics of Machines3MAE 411Advanced Mechatronics and Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing or WRIT 4033CSEE 4805and Capstone Project - Design & CSEE 481SEngineering for Societal Impact and Capstone Project - ImplementationROBE 471SPrinciples of Engineering Designand Capstone Project - Implementation	MAE 243	Mechanics of Materials	3
MAE 342Dynamics of Machines3MAE 411Advanced Mechatronics and Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing or WRIT 4033Capstone Design Sequence6-7CSEE 480S & CSEE 481SEngineering for Societal Impact and Capstone Project - Design a Capstone Project - Implementation5ROBE 411SPrinciples of Engineering Design3	MAE 316	Analysis of Engineering Systems	3
MAE 411Advanced Mechatronics3& 411Land Advanced Mechatronics Laboratory3MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing3or WRIT 305Technical Writing for Community & Industry6-7CSEE 380Engineering for Societal Impact & CSEE 480Sand Capstone Project - Design & CSEE 481Sand Capstone Project - ImplementationROBE 471SPrinciples of Engineering DesignPrinciples of Engineering Design8-11	MAE 342	Dynamics of Machines	3
MAE 460Automatic Controls3ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing or WRIT 4033Capstone Design Sequence6-7CSEE 380 & CSEE 480S & CSEE 481SEngineering for Societal Impact and Capstone Project - Design and Capstone Project - ImplementationROBE 471SPrinciples of Engineering Design	MAE 411 & 411L	Advanced Mechatronics and Advanced Mechatronics Laboratory	3
ROBE 313Fundamentals of Robotic Systems3ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing3or WRIT 305Technical Writing3or WRIT 403Grant Proposal Writing for Community & Industry6-7CSEE 380Engineering for Societal Impact6-7& CSEE 480Sand Capstone Project - Design6-7& CSEE 481Sand Capstone Project - Implementation80BOBE 471SPrinciples of Engineering Design80	MAE 460	Automatic Controls	3
ROBE 412Mobile Robotics3ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing3or WRIT 305Technical Writing3or WRIT 403Grant Proposal Writing for Community & Industry6-7CSEE 380Engineering for Societal Impact6-7& CSEE 480Sand Capstone Project - Design6-7& CSEE 481Sand Capstone Project - Implementation80BORE 471SPrinciples of Engineering Design80	ROBE 313	Fundamentals of Robotic Systems	3
ROBE 413Robotic Manipulators3ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing3or WRIT 305Technical Writing3or WRIT 403Grant Proposal Writing for Community & Industry67Capstone Design Sequence67CSEE 380Engineering for Societal Impact67& CSEE 480Sand Capstone Project - Design67& CSEE 481Sand Capstone Project - Implementation80BORE 471SPrinciples of Engineering Design80	ROBE 412	Mobile Robotics	3
ROBE 414Robot Autonomy3WRIT 304Business and Professional Writing3or WRIT 305Technical Writing3or WRIT 403Grant Proposal Writing for Community & Industry67Capstone Design Sequence6-7CSEE 380Engineering for Societal Impact& CSEE 480Sand Capstone Project - Design& CSEE 481Sand Capstone Project - ImplementationROBE 471SPrinciples of Engineering Design	ROBE 413	Robotic Manipulators	3
WRIT 304 Business and Professional Writing 3 or WRIT 305 Technical Writing 3 or WRIT 403 Grant Proposal Writing for Community & Industry 67 Capstone Design Sequence 6-7 CSEE 380 Engineering for Societal Impact & CSEE 480S and Capstone Project - Design & CSEE 481S and Capstone Project - Implementation ROBE 471S Principles of Engineering Design	ROBE 414	Robot Autonomy	3
or WRIT 305 Technical Writing or WRIT 403 Grant Proposal Writing for Community & Industry Capstone Design Sequence 6-7 CSEE 380 Engineering for Societal Impact & CSEE 480S and Capstone Project - Design & CSEE 481S and Capstone Project - Implementation ROBE 471S Principles of Engineering Design	WRIT 304	Business and Professional Writing	3
or WRIT 403 Grant Proposal Writing for Community & Industry Capstone Design Sequence 6-7 CSEE 380 Engineering for Societal Impact & CSEE 480S and Capstone Project - Design & CSEE 481S and Capstone Project - Implementation BOBE 471S Principles of Engineering Design	or WRIT 305	Technical Writing	
Capstone Design Sequence 6-7 CSEE 380 Engineering for Societal Impact & CSEE 480S and Capstone Project - Design & CSEE 481S and Capstone Project - Implementation BOBE 471S Principles of Engineering Design	or WRIT 403	Grant Proposal Writing for Community & Industry	
CSEE 380Engineering for Societal Impact& CSEE 480Sand Capstone Project - Design& CSEE 481Sand Capstone Project - ImplementationBOBE 471SPrinciples of Engineering Design	Capstone Design Sequence		6-7
RORE 471S Principles of Engineering Design	CSEE 380 & CSEE 480S & CSEE 481S	Engineering for Societal Impact and Capstone Project - Design and Capstone Project - Implementation	
& ROBE 472S and Engineering Systems Design	ROBE 471S & ROBE 472S	Principles of Engineering Design and Engineering Systems Design	
CS 4xx Technical Elective [*] 3	CS 4xx Technical Elective *		3
Total Hours 104-105	Total Hours		104-105

*

See BSCS (http://catalog.wvu.edu/undergraduate/collegeofengineeringandmineralresources/lanedepartmentofcomputerscienceand/computer_science/ #majortext) degree for list of electives with the CS subject code in 400-level or higher.

Suggested Plan of Study

It is important for students to take courses in the order specified as much as possible; all prerequisites and concurrent requirements must be observed. A typical B.S.C.S. / B.S. Robotics degree program that completes degree requirements in four and a half years is listed below.

First Year		
Fall	Hours Spring	Hours
CS 110	4 CS 111	4
& 110L	& 111L	
ENGL 101	3 ENGL 102	3
ENGR 101	2 MATH 156	4
ENGR 191	1 PHYS 111	4
	& 111L	
MATH 155	4	
GEF 5, 6, or 7	3	
	17	15

Second Year			
Fall	Hours	Spring	Hours
CS 210		4 CPE 271	4
		& 271L	
MAE 202		1 MAE 211	3
		& 211L	
MAE 241		3 MAE 212L	1
MATH 251		4 MAE 242	3
PHYS 112		4 MATH 261	4
& 112L			
		16	15
Third Year			
Fall	Hours	Spring	Hours
CS 220		3 CPE 310	4
		& 310L	
CS 330		4 CS 310	3
& 330L			
EE 221		4 CS 320	3
& 221L			
ROBE 313		3 EE 251	4
		& 251L	
MAE 243		3	
		17	14
Fourth Year			
Fall	Hours	Spring	Hours
MAE 316		3 CS 350	3
MAE 342		3 ECON 201 (GEF 4)	3
ROBE 412		3 ROBE 413	3
STAT 215		3 WRIT 304, 305, or 403	3
GEF 5, 6, or 7		3 GEF 5, 6, or 7	3
		15	15
Fifth Year			
Fall	Hours	Spring	Hours
CPE 453		3 CS 450	4
CS 410 or 422 [*]		3 MAE 460	3
MAE 411		3 ROBE 472S or CSEE 481S*	3
& 411L			
ROBE 414 [*]		3 CS 400-level Technical Elective	3
ROBE 471S or CSEE 480S [*]		3	
		15	13

Total credit hours: 152

*

Courses only taught in given semester

Program Educational Objectives

The Program Educational Objectives (PEO) of the Bachelor of Science in Computer Science (B.S.C.S.) program at West Virginia University are to produce graduates who will apply their knowledge of programming languages and paradigms, software development processes, hardware, services, the theory of computation, and other computing topics to achieve success in their careers in industry, research, government service, or academia. It is expected that early career graduates will demonstrate their adaptability to new technologies as they achieve success and proficiency in their profession, become recognized as leaders, and contribute to the betterment of society.

Student Outcomes

Upon graduation, all Bachelor of Science students in Computer Science will have an ability to:

- 1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- 2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- 3. Communicate effectively in a variety of professional contexts.
- 4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- 5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- 6. Apply computer science theory and software development fundamentals to produce computing-based solutions. The Program Educational Objectives (PEO) of the computer science program at West Virginia University are to produce graduates who will apply their knowledge of programming languages and paradigms, software development processes, hardware, services, the theory of computation, and other computing topics to achieve success in their careers in industry, research, government service, or academia. It is expected that early career graduates will demonstrate their adaptability to new technologies as they achieve success and proficiency in their profession, become recognized as leaders, and contribute to the betterment of society.