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# **COMPUTER SCIENCE, BACHELOR OF ARTS (B.A.)**

The Bachelor of Arts in Computer Science is a multidisciplinary program that integrates a curriculum of computer science courses with other areas of study. The program provides a foundation in the computer science discipline and encourages students to integrate different perspectives in order to formulate new ideas and solutions for today's computing challenges.

The degree requires a minimum of 120 credit hours. Students are required to attain a second major or a minor in another content area.

Student learning outcomes

## Upon completing this program, students will know and know how to do the following:

- 1. Analyze a complex computing problem and 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. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline
- Apply computer science theory and software development fundamentals to produce computing-based solutions
- Respond to complex problems, issues and ideas by proposing new ideas or solutions that understand and integrate the perspectives of multiple disciplines and stakeholders

### **Special requirements**

The B.A. in Computer Science requires a minimum of 120 credits. Students must receive a minimum grade of C in all computer science courses in order to graduate.

#### Degree requirements for Computer Science, Bachelor of Arts (B.A.)

Course	Title	Hours			
General education (http://bulletin.vcu.edu/undergraduate/ undergraduate-study/general-education-curriculum/)					
Select 30 credits of general education courses in consultation 30 with an adviser.					
Major requirements					
Major core requirements					
CMSC 235	Computing and Data Ethics	3			
CMSC 254	Introduction to Problem-solving	4			
CMSC 255	Introduction to Object-oriented Programming	4			
CMSC 256	Introduction to Data Structures	4			
CMSC 302	Introduction to Discrete Structures	3			
CMSC 311	Computer Organization	3			
CMSC 355	Fundamentals of Software Engineering	3			
CMSC 401	Algorithm Analysis with Advanced Data Structures	3			

1	Total Hours		120
5	Select any course.		20-24
(	Open electives		
Ş	Select a minor.		18
F	Required minor		
`		education quantitative foundations)	5
0	STAT 212	Concents of Statistics (satisfies deparal	3
ſ		Mamematical Structures	చ
		Interdisciplinary Theory and Practice	3
	Anciliary requiremen	IS	0
	CMSC 440	Data Communication and Networking	
	CMSC 438	Machine Learning	
	01000 407	Processing	
	CMSC 430	Introduction to Natural Language	
	CMSC 435	Artificial Intelligence	
	CMSC 428	Mobile Programming: IOS	
	01400 400	Interfaces	
	CMSC 427	Design and Implementation of User	
	CMSC 426	Software as a Service	
	CMSC 425	Introduction to Software Analysis and Testing	
	CMSC 420	Software Project Management	
	CMSC 415	Introduction to Cryptography	
	CMSC 414	Computer and Network Security	
	CMSC 413	Introduction to Cybersecurity	
	CMSC 412	Social Network Analysis and Cybersecurity Risks	
	CMSC 411	Computer Graphics	
	CMSC 410	Introduction to Quantum Computing	
	CMSC 408	Databases	
	CMSC 404	Compiler Construction	
	CMSC 312	Introduction to Operating Systems	
	CMSC 304	Programming Languages	
	CMSC 303	Introduction to the Theory of Computation	
	CMSC 257	Computer Systems	
-	Select four courses i	fom the following.	12-13

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#### The minimum number of credit hours required for this degree is 120.

What follows is a sample plan that meets the prescribed requirements within a four-year course of study at VCU. Please contact your adviser before beginning course work toward a degree.

Freshman year				
Fall semester		Hours		
CMSC 235	Computing and Data Ethics	3		
CMSC 254	Introduction to Problem-solving	4		
MATH 151	Precalculus Mathematics	4		

· Restricted electives

UNIV 111 Play course video for Focused Inquiry I	Focused Inquiry I (satisfies general education UNIV foundations)	3
	Term Hours:	14
Spring semes	ter	
CMSC 255	Introduction to Object-oriented Programming	4
MATH 211	Mathematical Structures	3
UNIV 112 Play course video for Focused Inquiry II	Focused Inquiry II (satisfies general education UNIV foundations)	3
General educa	ation courses	6
	Term Hours:	16
Sophomore ye	ear	
Fall semester		
CMSC 256	Introduction to Data Structures	4
CMSC 302	Introduction to Discrete Structures	3
UNIV 200	Advanced Focused Inquiry: Literacies, Research and Communication (satisfies general education UNIV foundations)	3
General educa	ation courses	6
	Term Hours:	16
Spring semes	ter	
CMSC 311	Computer Organization	3
STAT 212	Concepts of Statistics (satisfies general	3
	education quantitative foundations)	
General educa	ation courses	6
Minor course		3
	Term Hours:	15
Junior year		
Fall semester		
CMSC 355	Fundamentals of Software Engineering	3
MATH 310	Linear Algebra	3
Minor course		3
Open elective		3
Restricted ele		3
<b>o</b>	Ierm Hours:	15
Spring semes	ter	2
UDOT 001	Algorithm Analysis with Advanced Data Structures	3
IDST 301	Interdisciplinary Theory and Practice	3
Minor course		3
Open elective	ativa	3
nestricted ele		3
Conjorver	Term Hours.	15
Senior year		
Minor courses 6		
	e	0
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Restricted elective	3
Term Hours:	15
Spring semester	
Minor course	3
Open electives	8
Restricted elective	3
Term Hours:	14
Total Hours:	120

The minimum number of credit hours required for this degree is 120.