

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
4. Apply computer science theory and software development fundamentals to produce computing-based solutions
5. 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 (https://bulletin.vcu.edu/undergraduate/undergraduate-study/general-education-curriculum/)		
Select 30 credits of general education courses in consultation with an adviser.		30
Major requirements		
• Major core requirements		
CMSC 235	Computing and Data Ethics	3
CMSC 254	Introduction to Problem-solving	4
CMSC 255	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
• Restricted electives		
Select four courses from the following:		12-13

CMSC 303	Introduction to the Theory of Computation
CMSC 304	Programming Languages
CMSC 357	Computer Systems
CMSC 404	Compiler Construction
CMSC 405	Operating Systems
CMSC 408	Databases
CMSC 410	Introduction to Quantum Computing
CMSC 411	Computer Graphics
CMSC 412	Social Network Analysis and Cybersecurity Risks
CMSC 413	Introduction to Cybersecurity
CMSC 414	Computer and Network Security
CMSC 415	Introduction to Cryptography
CMSC 420	Software Project Management
CMSC 425	Introduction to Software Analysis and Testing
CMSC 426	Software as a Service
CMSC 427	Design and Implementation of User Interfaces
CMSC 428	Mobile Programming: iOS
CMSC 435	Introduction to Data Science
CMSC 436	Artificial Intelligence
CMSC 437	Introduction to Natural Language Processing
CMSC 438	Machine Learning
CMSC 440	Data Communication and Networking

Ancillary requirements

IDST 301	Interdisciplinary Theory and Practice	3
MATH 211	Mathematical Structures	3
MATH 310	Linear Algebra	3
STAT 212	Concepts of Statistics (satisfies general education quantitative foundations)	3

Required minor

Select a minor.	18
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Open electives

Select any course.	20-24
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Total Hours	120
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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

UNIV 111	Introduction to Focused Inquiry: Play course video for Introduction to Focused Inquiry: Investigation and Communicatio	3
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Term Hours: 14

Spring semester

CMSC 255	Object-oriented Programming	4
MATH 211	Mathematical Structures	3
UNIV 112	Focused Inquiry II (satisfies general Play course video for education UNIV foundations)	3
	General education courses	6

Term Hours: 16

Sophomore year**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 education courses	6

Term Hours: 16

Spring semester

CMSC 311	Computer Organization	3
STAT 212	Concepts of Statistics (satisfies general education quantitative foundations)	3
	General education 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 elective	3

Term Hours: 15

Spring semester

CMSC 401	Algorithm Analysis with Advanced Data Structures	3
IDST 301	Interdisciplinary Theory and Practice	3
	Minor course	3
	Open elective	3
	Restricted elective	3

Term Hours: 15

Senior year**Fall semester**

Minor courses	6
Open electives	6
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.