COMPUTER SCIENCE B.S.

Program Learning Outcomes

Mission: The mission of Computer Science Department is to prepare graduates for diverse, impactful careers in technology while nurturing a Christ-centered approach to leadership and service. We strive to enable all students that take our courses, non-majors and majors alike, to understand the core ideas of, utilize the tools from, and contribute to future advances in computer science.

Program Learning Outcomes

1. Technical Proficiency: Graduates will demonstrate mastery of core computer science concepts, programming languages, and software development practices, enabling them to solve complex problems and create innovative solutions.
2. Problem-Solving Skills: Students will develop strong analytical and critical thinking skills, applying them to identify, analyze, and address real-world computational challenges effectively.
3. Ethical and Character Development: Graduates will exhibit ethical conduct and character in their professional and personal lives, grounded in Christian values, as they navigate the ethical dilemmas often encountered in the technology industry.
4. Effective Communication: Students will effectively communicate complex technical ideas and solutions to diverse audiences, fostering collaboration and understanding in interdisciplinary settings.
5. Professional and Career Readiness: Graduates will be prepared for successful careers in various computer science fields, demonstrating readiness for leadership roles, adaptability to emerging technologies, and a commitment to service-oriented leadership with a Christ-centered approach.

Requirements

Code	Title	Units
Core Curriculum Requirements (https://catalog.vanguard.edu/interdisciplinary-offerings/core-curriculum/) [1]		50
Mathematics Core Requirements		20
Computer Science Major Requirements		53
General Electives		0
Total Units		**123**

Mathematics Core Requirements

Code	Title	Units
Lower Division:		
MATH-180C	Calculus 1	4
MATH-181C	Calculus II	4
MATH-265C	Intro to Statistical Methods	3
MATH-285	Introduction to Advanced Mathematics	3
Upper Division:		
MATH-300	Linear Algebra	3
MATH-375	Discrete Mathematics	3
Total Units		**20**

Computer Science Major Requirements

Code	Title	Units
Lower Division:		
CSCI-110C	Introduction to Computer Science	4
CSCI-205	Cybersecurity	3
CSCI-208	Java Programming	4
CSCI-216	Intro to Web Programming	4
CSCI-217	Database Systems 1	3
CSCI-218	Python Programming	4
Upper Division:		
CSCI-302	Algorithm Design and Applications	3
CSCI-305	Programming Languages	3
CSCI-317	Data Structures	4
CSCI-325	Introduction to Networks	3
CSCI-330	Introduction to Operating Systems	3
CSCI-411	Software Engineering 1	3
CSCI-415	Computer Architecture	3
CSCI-425	Computing Theory	3
CSCI-499C	Computer Science Capstone	3
Elective		**3**
Take 3 units from the following:		
CSCI-270	Special Topic in Computer Science	
CSCI-309	Network Security and Digital Crime	
CSCI-320	Digital Forensics and Investigation	
CSCI-450	Ug Research Internship Program	
MATH-390	Numerical Analysis	
Total Units		**53**

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Number of units required from the Core Curriculum not included in the major requirements below.

Four Year Plan

Disclaimer*: This sample Four Year Plan is provided as a guide for the recommended sequencing of courses. Vanguard University requires that students complete a minimum of 120 units of required course work as outlined on the Requirements tab in order to receive a Bachelor of Arts, Bachelor of Music, Bachelor of Science, or Bachelor of Science in Nursing degree. It is the student's responsibility to confirm with the department the course rotation before enrolling in courses. If applicable, please note the footnotes at the bottom of the page for additional information related to courses listed in a particular year and term. Questions, contact the Department of Physical Sciences and Applied Mathematics.*

Study Abroad Participation: *Students interested in participating in the university's Study Abroad programs are encouraged to reach out to the* Global Education and Outreach Office (studyabroad@vanguard.edu) *for more information and collaboration in their academic course planning. Students using Education and Training Benefits through the U.S. Department of Veteran Affairs are encouraged to also reach out to the* School Certifying Official

(veteranscertifyingofficial@vanguard.edu) for more information regarding how benefits can be applied.

Course	Title	Units
Year 1 Term 1		
CORE-100C	Cornerstone	1
MATH-180C	Calculus 1	4
ENGL-120C	Persuasive Writing	3
NT-101C	New Testament Survey	3
CSCI-110C	Introduction to Computer Science	4
	Units	**15**
Year 1 Term 2		
MATH-181C	Calculus II	4
CSCI-208	Java Programming	4
HIST-PLHD	History Core Requirement	3
THEO-101C	Foundations of Christian Life	3
KINE-148C	Lifetime Fitness and Wellness Lecture	3
	Units	**17**
Year 2 Term 1		
CSCI-217	Database Systems 1	3
MATH-265C	Intro to Statistical Methods	3
CSCI-205	Cybersecurity	3
COMM-201C	Speech Composition and Presentation	3
SOC-PLCR	Social Science Core Curriculum Reqm't	3
	Units	**15**
Year 2 Term 2		
MATH-285	Introduction to Advanced Mathematics	3
CSCI-218	Python Programming	4
ENGL-220C	Researched Writing	3
OT-201C	Old Testament Survey	3
SOC-PLCR	Social Science Core Curriculum Reqm't	3
	Units	**16**
Year 3 Term 1		
MATH-300	Linear Algebra	3
MATH-375	Discrete Mathematics	3
CSCI-317	Data Structures	4
CSCI-330	Introduction to Operating Systems	3
ENGL-230C	Literature and the Human Experience	3
	Units	**16**
Year 3 Term 2		
THEO-300C	Developing a Christian World View	3
CSCI-302	Algorithm Design and Applications	3
CSCI-305	Programming Languages	3
HIST-PLCR2	History Core Requirement (World Civ)	3
FINA-PLCR	Fine Arts Core Curriculum Requirement	3
	Units	**15**
Year 4 Term 1		
PSCI-PLCR2	Physics - Phys2/Lab or Elect/Mag	4
CSCI-415	Computer Architecture	3
CSCI-216	Intro to Web Programming	4
CSCI-ELECT	CSCI/MATH Elective	3
	Units	**14**
Year 4 Term 2		
CSCI-325	Introduction to Networks	3
CSCI-499C	Computer Science Capstone	3
CSCI-411	Software Engineering 1	3
CSCI-425	Computing Theory	3
CHIS-400C	Christian Heritage	3
	Units	**15**
	Total Units	**123**