Computer Science

Professors Michael Battig and Huw Read; Associate Professors Matthew Bovee, Jeremy Hansen, and Charles Snow; Assistant Professors Jonathan Adkins, Ahmed Abdeen Hamed and Lauren Provost; Lecturer Kris Rowley.

The program focuses on practical design and development in computational environments, as well as the underlying theoretical foundations that make these environments operate efficiently, reliably, and securely. Our graduates integrate knowledge from other disciplines, such as mathematics and engineering, and will enter organizations with a broad functional and enterprise perspective.

The Bachelor of Science program in Computer Science provides students with a solid foundation for a wide range of career fields and for entry into graduate-degree programs. This intense and challenging program provides extensive preparation in data structures, algorithms, and mathematics, leading to advanced courses in operating systems, parallelism, software engineering, computer networking, and information security. The graduates of this program have the in-depth knowledge of hardware, software, and applications, required to perform complex trade-off analyses at the hardware and software level. The technical studies in this program, combined with thoughtful selection of electives in the humanities and social sciences, prepare the graduate to be a future leader in our progressive information-based society.

Each student has an individually-assigned faculty advisor from their very first day on campus. The faculty advisor assists in the development of an individualized academic program designed to meet the student's career goals. The student and the faculty advisor work together to keep the student's individualized program on track throughout their enrollment at Norwich. Committed to strong ties linking the classroom, the computer labs, and the real world, this program focuses extensively on the application of classroom work to solving real-world computer-design and computer-application problems.

Goals:

Graduates will be able to:

- Apply their knowledge of computer science to problems encountered in their professional careers or in pursuit of advanced degrees;
- Use evolving technologies, analytical thinking, and design to address contemporary issues;
- Communicate well orally and in writing, interact professionally, and work effectively on multidisciplinary teams to achieve project objectives; and
- Uphold high ethical standards, including concern for the impact of computing on individuals, organizations, and society.

Outcomes:

Upon graduation, students will:

- Be competent in theoretical and mathematical foundations of computer science;
- Be proficient in at least one programming language and have a basic knowledge of at least one other;
- Understand the hardware and software architecture of computer systems;
- Demonstrate the ability to participate in professional practices related to software engineering;
- Be able to communicate effectively about computer science-related topics; and,
- Demonstrate the ability to be responsible practitioners of computer science and understand the social and ethical implications of computing.

Careers for this Major:

- Chief Information Officer
- Chief Technical Officer
- Computer Support Specialist
- Information Systems Manager
- Network Administrator
- Software Engineer
- Software Tester
- Systems Administrator

Major

Computer Science (B.S.) – Curriculum Map 2021-2022 Catalog

Course	Cr.	Comp.	Course	Cr.	Comp.
FRESHMAN					
Fall			**Spring**		
CS 100 Foundations of Computer Science and Information Assurance [1]	3		CS 142 Introduction to Python Programming	3	
CS 111 Personal & Professional Cyber Safety	1		EN 111 Writing and Inquiry in Academic Contexts	3	
EN 110 Writing and Inquiry in Public Contexts	3		MA 121 Calculus I (General Education Math)	4	
General Education History (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/)	3		General Education Arts & Humanities (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/)	3	
MA 107 Precalculus Mathematics [2]	4		General Education Leadership (http://catalog.norwich.edu/residentialprogramscatalog/generaleducationgoals/#goal8leadershiptext)	1-3	
Fall Semester Total Cr.:	**14**		**Spring Semester Total Cr.:**	**14-16**	
SOPHOMORE					
Fall			**Spring**		
CS 140 Programming and Computing [1]	4		CS 228 Introduction to Data Structures	3	
EE 215 Fundamentals of Digital Design	4		CS 240 Database Management	3	

General Education Lab Science (http://catalog.norwich.edu/ residentialprogramscatalog/ generaleducationgoals/)	4	CS 260 Data Communications and Networks	3
MA 122 Calculus II (General Education Math)	4	General Education Lab Science (http://catalog.norwich.edu/ residentialprogramscatalog/ generaleducationgoals/)	4
		Free Elective	3
Fall Semester Total Cr.:	**16**	**Spring Semester Total Cr.:**	**16**

JUNIOR			
Fall		**Spring**	
EE 321 Embedded Systems	4	CS 270 Operating Systems & Parallelism	3
CS 212 Assembly Language & Reverse Engineering	3	CS 301 Software Engineering	3
MA 306 Discrete Mathematics	3	MA 380 Theory of Computation	3
Technical Elective [3,4]	3	Technical Elective [3,4]	3
QM 213 Business and Economic Statistics I or MA 232 Elementary Statistics	3	Free Elective	3
Fall Semester Total Cr.:	**16**	**Spring Semester Total Cr.:**	**15**

SENIOR			
Fall		**Spring**	
CS 420 Computer Science capstone I or 430 Computer Science Undergraduate Thesis I	3	CS 421 Computer Science capstone II or 431 Computer Science Undergraduate Thesis II	3
PH 215 Survey of Ethics (General Education Ethics) or 322 Money, Meaning and Morality	3	General Education Social Science (http://catalog.norwich.edu/ residentialprogramscatalog/ generaleducationgoals/)	3
General Education Literature (http://catalog.norwich.edu/ residentialprogramscatalog/ generaleducationgoals/)	3	Mathematics Elective [5]	3
Technical Elective [3,4]	3	Technical Elective [3,4]	3
Free Elective	3	Free Elective	3
Fall Semester Total Cr.:	**15**	**Spring Semester Total Cr.:**	**15**
TOTAL CREDITS FOR THIS MAJOR: 121-123			

[1]   Must earn a grade of "C" or higher

[2]   Enrollment requires a math placement exam (MPE) score of 2. Students scoring below 2 must successfully complete the appropriate necessary prerequisite math courses first. With a math placement score of 3 a free elective may be substituted for the MA 107 requirement credit hours

[3]   Any non-duplicate course from CS (higher than CS 249; excluding CS300), from DF (DF 242 or higher), from EE (EE 200 or higher), or from IA (IA 241 or higher).

[4]   Earned internship credit (CS410) may be applied to not more than two technical electives

[5]   MA 223, MA 224, MA 240, MA 241, MA 309, MA 318, or MA 421

Minor

Computer Science Minor - Curriculum Map 2021-2022

A Computer Science or Computer Security & Information Assurance major is ineligible to declare the minor. Each course requires a grade of C or higher. Please also refer to the course descriptions for any course prerequisites.

CS 140	Programming and Computing	4
CS 228	Introduction to Data Structures	3
EE 215	Fundamentals of Digital Design	4
MA 306	Discrete Mathematics	3
Minor Elective Courses: choose two of the following		**6**
CS 212	Assembly Language & Reverse Engineering	3
CS 240	Database Management	3
CS 250	Virtual Systems Administration	3
CS 260	Data Communications and Networks	3
CS 270	Operating Systems & Parallelism	3
CS 280	Introduction to Data Science	3
CS 290	Contemporary Data Visualization	3
CS 301	Software Engineering	3
CS 305	Advanced Data Science	3
CS 315	Intro to Data & Web Mining	3
CS 437	Machine Learning & Artificial Intelligence	3
Total Cr.		**20**