

Computer Security & Information Assurance

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Center of Academic Excellence in Digital Forensics and Cyber Defense Education

Norwich University is one of very few academic institutions to be designated as both a Center of Academic Excellence in Cyber Defense Education (<https://www.nsa.gov/resources/educators/centers-academic-excellence/cyber-defense>) since 2001, by the National Security Agency of the United States of America) and a Center of Digital Forensics Academic Excellence (<http://www.dc3.mil>) (since 2012, by the Defense Cyber Crime Center of the United States Air Force Office of Special Operations). These designations recognize Norwich's significant contribution in meeting national demand for digital-forensics and information-assurance education, developing a growing number of professionals with expertise in both areas, and ultimately contributing to the protection of the national critical information infrastructure.

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 practical application of classroom work to solving real-world problems in forensics and information assurance.

The Computer Security and Information Assurance (<http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/collegeofprofessionalschools/schoolofbusinessandmanagement/csia/#majorsconcentrationstext>) (CSIA) major provides a foundation of study in computer programming, digital forensics and information assurance, as well as in the liberal arts, mathematics, management, and the sciences. Students integrate knowledge from these disciplines to enter organizations with both practical, functional capabilities and an enterprise perspective. During Spring Semester sophomore CSIA majors must select from two available areas of specialization – Forensics (<http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/collegeofprofessionalschools/schoolofbusinessandmanagement/csia/#majorsconcentrationstext>) or Information Assurance Management (<http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/collegeofprofessionalschools/schoolofbusinessandmanagement/csia/#majorsconcentrationstext>) (students can successfully complete both by taking additional courses per semester). The curriculum of the major complies with the standards (<http://niatec.info/viewpage.aspx?id=103>) defined by the Committee on National Security Systems (CNSS (<https://www.cnss.gov/cnss>)) required by the National Information Assurance Training and Education Center (NIATEC (<http://niatec.info/ViewPage.aspx?id=0>)).

- Forensics (<http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/collegeofprofessionalschools/schoolofbusinessandmanagement/csia/#majorsconcentrationstext>) Concentration (<http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/collegeofprofessionalschools/schoolofbusinessandmanagement/csia/#majorsconcentrationstext>) prepares graduates for practical application of current forensics theory, ethics, techniques, skills, and tools, for all levels of digital-incident investigation relevant to solving policy violations and crimes. Students learn and apply foundational concepts, terminology and techniques ranging from the extraction and analysis of digital evidence, its sources and communication, to process-, system- and program-design.
- Information Assurance (IA) Management Concentration (<http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/collegeofprofessionalschools/schoolofbusinessandmanagement/csia/#majorsconcentrationstext>) prepares graduates to analyze requirements and implement measures to protect information confidentiality, control, integrity, authenticity, availability, and utility, and to maintain their technical and managerial competence in the face of ever-changing requirements and technology. Students integrate concepts, terminology, and techniques from operations management, organizational psychology, and information assurance for the effective development and implementation of IA in organizations.

Goals:

To develop in or provide for students

- Foundational competency in liberal arts, mathematics, management, the sciences, and computer programming;
- An understanding and appreciation for the evolving nature and role of technology at all levels of society;
- An understanding of individual privacy rights and the impact of large-scale data collection and interconnected data sources;
- Multiple, differing perspectives on information security;
- Ethical decision-making principles for deciding how best to implement information assurance in all environments;
- Integrated knowledge and practical skills in digital forensics and information assurance;
- An appreciation for the organizational importance and applications of digital forensics and information assurance;
- Advanced specialization in the theory, practice, and application, of digital forensics or information-assurance management;
- Preparedness to participate with computer-security professionals in multiple environments, such as: industry, government, military, and academia;
- A multidisciplinary perspective coupled with the commitment to integrate human factors for success in defending information resources; and,
- Readiness for continuing, perpetual education in a constantly changing field.

Outcomes:

Upon graduation successful students will competently demonstrate:

- Clear and effective communication of the fundamentals of computers, computer science, computer security, and information assurance;
- Facility in at least one programming language and a basic knowledge of at least one other;

- Ability to identify and discuss the fundamental hardware and software architecture of computer systems;
- Application of fundamental theory and practice of digital forensics, digital-incident investigation, and information assurance;
- Professional-level knowledge regarding cyber-law and cyber-crime, including: identifying and classifying cyber-crimes; the motivations of cyber-criminals; seizure and handling of computer-related evidence; admissibility of digital-incident evidence in courts of law; preparing and delivering professional testimony; and the key regulations and laws regarding cyber-crimes of varying types and jurisdictions;
- Ethical, responsible conduct, both personal and professional, in their computer-security and information-assurance practices consistent with the highest professional standards of the field; and
- Depth of knowledge and application of the concepts, terminology and techniques of their chosen concentration area.

Careers for this Major:

The CSIA curriculum provides a balanced foundation of both information assurance and digital forensics. The Information Assurance Management concentration emphasizes upper-level coursework associated with implementation, management and support of corporate networks, information, and cyber defense programs. The Forensics concentration emphasizes upper-level coursework on the skills, practices and policies of digital forensics and cyber-investigation. All organizations need professionals with either skill set. However, there is a tendency for IA Management to be more oriented toward careers with for-profit commercial and non-profit public organizations, and for Forensics to be more oriented toward careers with federal, state, and local government agencies. Students' elective course choices further influence the career opportunities open to them. Potential careers include:

- Computer Network Defense
- Counterintelligence
- Counterterrorism
- Cyber-Crime Investigation & Analysis
- Cyber-Forensics Investigation
- Cyber-Incident Analysis & Response
- Cyber-Intelligence
- Cyber-Security
- Cyber-Warfare and National Security
- Information Systems/Technology Management
- Law enforcement (federal, state, local)
- Legal studies and practice of law as attorneys
- Malware Analysis
- Penetration Testing
- Threat Analysis

Major & Concentrations

B.S. Computer Security & Information Assurance - Curriculum Map 2018-2019 Catalog

Print PDF Curriculum Map (http://catalog.norwich.edu/residentialprogramscatalog/collegeofprofessionalschools/schoolofbusinessandmanagement/csia/cia_1532372647361.pdf)

Students must declare either the Forensics Concentration, the Information Assurance Management Concentration, or both (see requirements below) no later than the end of the sophomore year.

Course	Cr.Comp	Course	Cr.Comp.
FRESHMAN			
Fall		Spring	
CS 100 Foundations of Computer Science and Information Assurance	3	CS 140 Programming and Computing	4
CS 111 Personal & Professional Cyber Safety	1	EN 102 Composition and Literature II	3
EN 101 Composition and Literature I	3	General Education Arts & Humanities (http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/generaleducationgoals)	3
MA 107 Precalculus Mathematics ¹	4	General Education History (http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/generaleducationgoals)	3
PY 211 Introduction to Psychology	3	Free Elective	3
General Education Leadership (http://catalog.norwich.edu/archives/2018-19/residentialprogramscatalog/generaleducationgoals)	1-3		
Fall Semester Total Cr.:	15-17	Spring Semester Total Cr.:	16

SOPHOMORE			
Fall		Spring	
CS 228 Introduction to Data Structures	3	CS 212 Assembly Language & Reverse Engineering	3
IA 241 Cyberlaw and Cybercrime	3	CS 260 Data Communications and Networks	3
MA 240 Introduction to Number Theory and Cryptology (General Education Math)	3	MA 318 Cryptology (General Education Math)	3
MG 341 Business Law I (General Education Ethics)	3	General Education Lab Science (http://catalog.norwich.edu/archives/2018-19/residentialprograms/catalog/generaleducationgoals)	4
General Education Lab Science (http://catalog.norwich.edu/archives/2018-19/residentialprograms/catalog/generaleducationgoals)	4	Free Elective	3
Fall Semester Total Cr.:		16	Spring Semester Total Cr.:
		16	16
JUNIOR			
Fall		Spring	
DF 242 Computer Forensics I	4	CS 240 Database Management	3
EN 112 Public Speaking	3	IA 342 Management of Information Assurance	3
IA 340 Introduction to Information Assurance	3	QM 213 Business and Economic Statistics I	3
Concentration Elective	3	Concentration Elective	3
Free Elective	3	Concentration Elective	3
Fall Semester Total Cr.:		16	Spring Semester Total Cr.:
		16	15
SENIOR			
Fall		Spring	
CS 301 Software Engineering	3	IA 456 Cyber Defense Practicum (Capstone)	3
IA 455 Contemporary Issues in Information Assurance	3	Concentration Elective	3
Concentration Elective	3	Concentration Elective	3
General Education Literature (http://catalog.norwich.edu/archives/2018-19/residentialprograms/catalog/generaleducationgoals)	3	Free Elective	3
Free Elective	3	Free Elective	3
Fall Semester Total Cr.:		15	Spring Semester Total Cr.:
		15	15
TOTAL CREDITS FOR THIS MAJOR: 124-126			

¹ Requires math placement score of 2. Students scoring below 2 must satisfactorily complete the appropriate necessary prerequisite math course(s) first. Waived with math placement score of 3.

Concentrations

Forensics Concentration 2018-2019 Catalog

All courses used to fulfill a concentration must be completed with a grade of C or higher.

Required Courses

DF 311	Network Forensics	3
DF 312	Malware Forensics	3
DF 411	Cyber Investigation	3
DF 425	Advanced Digital Forensics	3

Elective Courses - Choose any non-duplicate two of the following courses:

CS 221	GUI Programming	3
CS 250	Virtual Systems Administration	3
CS 270	Operating Systems & Parallelism	3
CS 330	Ethics in Computing and Technology	3
CS 406	Special Topics in Computer Science *	3
CS 407	Politics of Cyberspace	3
CS 410	Computing Internship *	3
IA 360	Network Security	3
MG 309	Management of Organizations	3
MG 346	Business Law II	3
MG 351	Organizational Behavior	3

PY 234	Forensic Psychology	3
Total Cr.		18

* May be taken more than once for credit by approval, contingent on each section taken covering substantively different content.

Information Assurance Management Concentration 2018-2019 Catalog

All courses used to fulfill a concentration must be completed with a grade of C or higher.

Required Courses

CS 270	Operating Systems & Parallelism	3
IA 360	Network Security	3
MG 309	Management of Organizations	3
MG 351	Organizational Behavior	3

Elective Courses - Choose any non-duplicate two of the following:

CS 221	GUI Programming	3
CS 250	Virtual Systems Administration	3
CS 330	Ethics in Computing and Technology	3
CS 406	Special Topics in Computer Science *	3
CS 407	Politics of Cyberspace	3
CS 410	Computing Internship *	3
DF 311	Network Forensics	3
DF 312	Malware Forensics	3
DF 411	Cyber Investigation	3
DF 425	Advanced Digital Forensics	3
MG 346	Business Law II	3
PY 234	Forensic Psychology	3

Total Cr.		18
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* May be taken more than once for credit by approval, contingent on each section taken covering substantively different content.