

Bachelor of Science Cybersecurity with a Major in Artificial Intelligence for Cybersecurity

Web Site: <https://www.odu.edu/cyber> (<https://www.odu.edu/cyber/>)

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The Artificial Intelligence for Cybersecurity (AI for Cyber) major is an interdisciplinary undergraduate program within the School of Cybersecurity that equips students with the knowledge and skills to address emerging Cybersecurity challenges using AI-driven solutions. Combining core principles of Cybersecurity with machine learning, data analysis, and intelligent automation, the program prepares students to develop and deploy AI-enabled tools for threat detection, malware analysis, secure systems design, and real-time cyber defense. Designed to meet growing workforce demands across the defense, critical infrastructure, finance, and technology sectors, AI for Cyber aligns with national priorities, including the NICE Framework, the NIST AI Risk Management Framework, and the DoD Cyber Strategy. The program also supports NSA-CAE (<https://www.nsa.gov/Academics/Centers-of-Academic-Excellence/CAE-CO-Fundamental/>) initiatives by advancing AI-integrated cybersecurity education and research.

Requirements

Lower-Division General Education

Written Communication (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#written)	6
Oral Communication (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#oral)	3
Mathematics (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#math)	3
Language and Culture (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#language)	0-6
Information Literacy and Research (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#information)	3
Human Behavior (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior)	3
Human Creativity (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity)	3
Interpreting the Past (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret)	3
Literature (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature)	3
Philosophy and Ethics (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy)	3
The Nature of Science (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#nature)	8
Impact of Technology (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#impact)	3

Written Communication: Grade of C or better required in both written communication courses and in ENGL 110C before declaring major.

Mathematics: MATH 162M required.

Impact of Technology: met with CYSE 200T/IT 200T in the major

Human Behavior: CRJS 215S or DASC 205S/SOC 205S

Upper-Division General Education

Met in the major.

Requirements for Graduation

Requirements for graduation include the following:

- Minimum of 120 credit hours.
- Minimum of 30 credit hours overall and 12 credit hours of upper-level courses in the major program from Old Dominion University.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken toward the major.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken toward a minor.
- Completion of ENGL 110C, ENGL 211C or ENGL 231C, and the writing intensive (W) course in the major with a grade of C or better. The W course must be taken at Old Dominion University.
- Completion of Senior Assessment.

Artificial Intelligence for Cybersecurity Major

General Education

Complete lower-division requirements	38-44
Complete upper-division requirements (met in the major)	

Core Courses

IDS 300W	Interdisciplinary Theory and Concepts *	3
CYSE/IT 200T	Cybersecurity, Technology, and Society	3
CYSE 201S	Cybersecurity and the Social Sciences	3
CYSE 250	Basic Cybersecurity Programming and Networking	3
CYSE 300	Introduction to Cybersecurity	3
CYSE 301	Cybersecurity Techniques and Operations	3
CYSE/CRJS/CPD 406	Cyber Law	3
CYSE/POLS 425W	Cybersecurity Strategy and Policy *	3

Required AI Courses

CS 422	Introduction to Machine Learning	3
PHIL/AI 446	Artificial Intelligence (AI) Ethics and Policy	3
CYSE/AI 410	Artificial Intelligence (AI) Methods and Models	3
CYSE 420	Applied Machine Learning in Cybersecurity	3
CYSE 421	Generative AI in Cybersecurity	3

Electives

Select three of the following:		9
CS 455	Introduction to Networks and Communications	
CS 463	Cryptography for Cybersecurity	
CS 464	Networked Systems Security	
CS 469	Data Analytics for Cybersecurity	
CS 472	Network and Systems Security	
CYSE 270	Linux System for Cybersecurity	
CYSE 280	Windows System Management and Security	
CYSE 450	Ethical Hacking and Penetration Testing	

Other Electives

22-28

Students can take the electives from any discipline at ODU and/or complete prerequisites for Principles and Application courses, as needed, to complete the required 120 credit hours. However, no more than 29 credits from courses in the Strome College of Business may be applied to the degree requirements, including named elective courses and general electives (ACCT, BNAL, BUSN, ECON, ENTR, FIN, INBU, IT, MGMT, MKTG, MSCM, OPMT, PAS, PORT, REST, RMI).

Capstone Courses

CYSE 368 or CYSE 494	Cybersecurity Internship Entrepreneurship in Cybersecurity	3
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Capstone enrollment is restricted to declared Cybersecurity (CYSE) majors only. An active internship is required to enroll in CYSE 368. Non-CYSE majors are not permitted to enroll.

IDS 493	IDS Electronic Portfolio Project	3
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Total Credit Hours 114-126

* A grade of C or better is required in this course if it is used towards the University Writing Requirement.

Degree Program Guide

The Degree Program Guide is a suggested curriculum to complete this degree program in four years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

Course	Title	Credit Hours
Freshman		
Fall		
ENGL 110C	English Composition (Grade of C or better required)	3
MATH 162M	Precalculus I	3
Oral Communication		3
Information Literacy and Research		3
Human Behavior (CRJS 215S or DASC 205S/SOC 205S required)		3
Credit Hours		15
Spring		
CYSE/IT 200T	Cybersecurity, Technology, and Society	3
Interpreting the Past		3
Human Creativity		3
Literature		3
Elective		3
Credit Hours		15
Sophomore		
Fall		
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research (Grade of C or better required) or Writing, Rhetoric, and Research: Special Topics	3
Philosophy and Ethics		3
Nature of Science I		4
CYSE 201S	Cybersecurity and the Social Sciences	3
CYSE 250	Basic Cybersecurity Programming and Networking	3
Credit Hours		16

Spring

Nature of Science II		4
CYSE 300	Introduction to Cybersecurity	3
Program prerequisites or electives		7

Credit Hours 14

Junior

Fall

CS 422	Introduction to Machine Learning	3
CYSE/AI 410	Artificial Intelligence (AI) Methods and Models	3
Program prerequisites or electives		9

Credit Hours 15

Spring

CYSE/POLS 425W	Cybersecurity Strategy and Policy *	3
CYSE 301	Cybersecurity Techniques and Operations	3

CYSE 420 or CYSE 421	Applied Machine Learning in Cybersecurity or Generative AI in Cybersecurity	3
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Required Program electives		6
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Credit Hours 15

Senior

Fall

CYSE 368 or CYSE 494	Cybersecurity Internship or Entrepreneurship in Cybersecurity	3
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CYSE 420 or CYSE 421	Applied Machine Learning in Cybersecurity or Generative AI in Cybersecurity	3
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PHIL/AI 446	Artificial Intelligence (AI) Ethics and Policy	3
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IDS 300W	Interdisciplinary Theory and Concepts *	3
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Elective		3
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Credit Hours 15

Spring

IDS 493	IDS Electronic Portfolio Project	3
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Required Program elective		3
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CYSE 406 or CRJS 406 or CPD 406	Cyber Law or Cyber Law or Cyber Law	3
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Electives		6
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Credit Hours 15

Total Credit Hours 120

* A grade of C or better is required in this course if it is used towards the University Writing Requirement.

Language and Culture I & II may be met in high school and are not included in this four-year plan. Please see requirement details.