Bachelor of Science
Cybersecurity (BS)

Web Site: https://www.odu.edu/cyber

Saltuk Karahan, Undergraduate Program Director
skarahan@odu.edu (http://catalog.odu.edu/email:skarahan@odu.edu)

The Bachelor of Science degree in cybersecurity provides opportunities for students to integrate education and training with the application of problem-solving skills in the lab environment. Courses are drawn from the disciplines of philosophy, computer science, computer engineering, information technology, and criminal justice to examine the multi-faceted nature of cybersecurity. Students admitted to the program have a variety of credit options including portfolio review, CLEP, DANTES, and departmental exams. For more information about the cybersecurity interdisciplinary program, email cyber@odu.edu or Dr. Saltuk Karahan (skarahan@odu.edu).

Requirements

Lower-Division General Education

Written Communication (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#written) 6
Oral Communication (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#oral) 3
Mathematics (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#math) 3
Language and Culture (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#language) 0-6
Information Literacy and Research (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#information) 3
Human Behavior (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior) 3
Human Creativity (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity) 3
Interpreting the Past (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret) 3
Literature (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature) 3
Philosophy and Ethics (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy) 3
The Nature of Science (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#nature) 8
Impact of Technology (http://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. MATH 211 and MATH 212 are required as prerequisites for selected upper-division ECE and MSIM courses.

Philosophy and Ethics: can be met by PHIL 355E
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.

Cybersecurity Major

General Education

Complete lower-division requirements 35-44
Complete upper-division requirements (met in the major)

Prerequisite Courses

Students may be required to complete an additional 15-36 hours of prerequisite courses depending on which Principles and Application courses they select.

Interdisciplinary Writing Course

IDS 300W Interdisciplinary Theory and Concepts 3

Core Courses

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 425W Cybersecurity Strategy and Policy (C or better required) 3
or POLS 425W Cybersecurity Strategy and Policy 3
CS 462 Cybersecurity Fundamentals 3

Principles Courses

Select three courses from the following. The coursework allows students to study the selected cybersecurity principles of their choice aligned with their interests and career goals.

CRJS 310 Cybercriminology: Foundations
CS 463 Cryptography for Cybersecurity
CS 464 Networked Systems Security
CYSE 495 Topics in Cybersecurity (Human Factors and Policy Management in Cybersecurity)

ECE/MSIM 416 Cyber Defense Fundamentals
ECE/MSIM 419 Cyber Physical System Security
ECE/MSIM 470 Foundations of Cyber Security
IT 315 Introduction to Networking and Security *
IT 417 Management of Information Security *
IT 418 Enterprise Information Assurance *
or CS 465 Information Assurance for Cybersecurity
PHIL 355E Cybersecurity Ethics

Application Courses *

Select three courses from the following. The coursework allows students to apply fundamental cybersecurity theories and techniques in their selected application domains.

CYSE 270 Linux System for Cybersecurity
CYSE 280 Windows System Management and Security
CYSE 407/ CRJS 395 Digital Forensics
CYSE 420 Applied Machine Learning in Cybersecurity
CYSE 426 Cyber War
or POLS 426
CYSE 450 Ethical Hacking and Penetration Testing
CS 467 Introduction to Reverse Software Engineering
CS 471 Operating Systems
ECE 452 Introduction to Wireless Communication Networks
ECE 455 Network Engineering and Design
IT 410 Business Intelligence *
IT 416 Network Server Configuration and Administration *
IT 419 Enterprise Cyber Defense *
IT 461 Implementing Internet Applications *
RMI 412 Property & Liability Insurance Company Operations *
or RMI 443 Enterprise Risk Management

Capstone Courses
CYSE 368 Cybersecurity Internship 3
or CYSE 494 Entrepreneurship in Cybersecurity
IDS 493 IDS Electronic Portfolio Project 3

Electives (minimum of 19 credit hours)
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, ECON, FIN, IT, OPMT, MSCM, MGMT, ENTR, MKTG).

Total Credit Hours 120-150

* 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, ECON, FIN, IT, OPMT, MSCM, MGMT, ENTR, MKTG).

+ Other courses may be substituted with the approval of the program coordinator.

No more than two classes, or six credits, may be counted for both the major and a minor. Some minors may allow fewer credits to share.

Electives
Elective credit may be needed to meet the minimum of 120 hours required for the degree.

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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td></td>
<td></td>
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<tr>
<td>Fall</td>
<td></td>
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</tr>
<tr>
<td>ENGL 110C</td>
<td>English Composition (Grade of C or better required)</td>
<td>3</td>
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<tr>
<td>MATH 162M</td>
<td>Pre-Calculus I</td>
<td>3</td>
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<tr>
<td>Oral Commun.</td>
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<td>3</td>
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<tr>
<td>Inform. Liter.</td>
<td></td>
<td>3</td>
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<tr>
<td>Human Behavior</td>
<td>CRJS 215S or DASC 205S/SOC 205S</td>
<td>3</td>
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</tbody>
</table>

Credit Hours 15

Spring
ENGL 211C or ENGL 231C Writing, Rhetoric, and Research (Grade of C or better required) or Writing, Rhetoric, and Research, Special Topics
Interpreting the Past
CYSE 250 Basic Cybersecurity Programming and Networking
Approved prerequisite or program elective
CYSE 201S Cybersecurity and the Social Sciences

Credit Hours 15

Sophomore
Fall
Nature of Science I 4

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<tr>
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<td>Cybersecurity, Technology, and Society (Meets Impact of Technology)</td>
<td>3</td>
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<td>CYSE 300</td>
<td>Introduction to Cybersecurity</td>
<td>3</td>
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</table>

Select one of the following:

CYSE 406 Cyber Law
CRJS 406 Cyber Law
CPD 406 Cyber Law
Approved prerequisite or program elective

Credit Hours 16

Junior
Fall
IDS 300W Interdisciplinary Theory and Concepts
Philosophy and Ethics (Can be met by PHIL 355E)
Principles course selection 1 of 3
Approved prerequisite or program elective

Credit Hours 16

Spring
Human Creativity

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>CYSE 425W or POLS 425W Cybersecurity Strategy and Policy (C or better required)</td>
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Application course selection 2 of 3
Approved prerequisite or program elective

Credit Hours 15

Spring
Human Creativity

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<td>Introduction to Cybersecurity</td>
<td>3</td>
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</tbody>
</table>

Select one of the following:

CYSE 406 Cyber Law
CRJS 406 Cyber Law
CPD 406 Cyber Law
Approved prerequisite or program elective

Credit Hours 16

Junior
Fall
IDS 300W Interdisciplinary Theory and Concepts
Philosophy and Ethics (Can be met by PHIL 355E)
Principles course selection 2 of 3
Application course selection 1 of 3
Approved prerequisite or program elective

Credit Hours 16

Spring
Human Creativity

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<th>Credit Hours</th>
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Application course selection 2 of 3
Approved prerequisite or program elective

Credit Hours 15

Spring
Human Creativity
<table>
<thead>
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<th>Course</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>Literature</td>
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<td>Principles course selection 3 of 3</td>
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<tr>
<td>Application course selection 3 of 3</td>
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<tr>
<td>Approved program elective</td>
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<td>3</td>
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<tr>
<td><strong>Credit Hours</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>CYSE 368 or CYSE 494</td>
<td>3</td>
</tr>
<tr>
<td>Cybersecurity Internship or Entrepreneurship in Cybersecurity</td>
<td>3</td>
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<tr>
<td>IDS 493</td>
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<tr>
<td>IDS Electronic Portfolio Project</td>
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<tr>
<td>Approved program elective</td>
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<td><strong>Total Credit Hours</strong></td>
<td><strong>120</strong></td>
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Language and Culture I & II may be met in high school and are not included in this four-year plan. Please see requirement details.