ARTIFICIAL INTELLIGENCE FOR CYBERSECURITY (ADV CERT)

Overview

Well-trained cybersecurity professionals are needed to secure our information systems and national infrastructure. However, in order to respond to increasingly sophisticated and varied attacks, these professionals should not only be familiar with traditional cybersecurity methods but also be adept at accessing, manipulating, and analyzing the enormous amounts of data generated by modern computing systems. The advanced certificate in artificial intelligence for cybersecurity helps to meet this need by ensuring that those entering the field, as well as cybersecurity professionals, establish a solid background in data science and have experience in applying data science methods to cybersecurity problems.

Two courses taken toward the certificate may double count with any of the existing master's and doctoral degree programs in computer and information science (M.S. in cybersecurity, M.S. in data science, M.S. in computer science, and Ph.D. in computer science).

Learning Outcomes

The advanced certificate in artificial intelligence for cybersecurity enables students to attain, by the time of certificate completion, the following:

1. Foundational knowledge of data mining and machine learning methods and how they can be applied to address real-world problems
2. A thorough understanding of data privacy and data security issues
3. The programming skills necessary to manipulate large data sets and to implement data mining and machine learning models
4. Experience applying data science and AI methods to solve cybersecurity problems such as intrusion detection, malware detection, and spam detection

CIP Code

30.7001 - Data Science, General.

You can use the CIP code to learn more about career paths associated with this field of study and, for international students, possible post-graduation visa extensions. Learn more about CIP codes and other information resources.

Admissions

Admission requirements for the program include the following:

- Completed and signed application
- Application fee
- Written statement of intent
- Official undergraduate transcript (and graduate transcript, if applicable)
- Two reference letters
- Resume

Requirements

The curriculum consists of five courses (two required core and three electives) spanning two to four semesters, resulting in a 15-credit advanced certificate in artificial intelligence for cybersecurity.

Prerequisites

Cybersecurity

Students are expected to enter the advanced certificate program with a basic knowledge of cybersecurity equivalent to CISC 5650 Cybersecurity Essentials. Alternatively, students must complete CISC 5650 prior to completing the advanced certificate or before taking any courses that require this course as a prerequisite.

Computer Programming

All students are expected to have some knowledge of computer programming, as assessed by a Python examination. Those with insufficient background must take CISC 5380 Programming with Python.

Curriculum

Course	Title	Credits
Required Courses		
CISC 5660	Data Science for Cybersecurity	3
CISC 6670	Artificial Intelligence for Cybersecurity	3
Electives		
One Cybersecurity-Focused course [1]		3
One Data Science-Focused course [1]		3
One Cybersecurity or Data Science-Focused course		3
Total Credits		**15**

[1] See below lists of courses fulfilling each requirement.

Cybersecurity-Focused courses

Courses in this group have the DCCF attribute.

Course	Title	Credits
CISC 6600	Cloud Computing Security	3
CISC 6640	Privacy and Security in Big Data	3
CISC 6660	Applied Cryptography	3
CISC 6800	Malware Analytics and Software Security	3
CISC 6880	Blockchain Technology	3

Data Science-Focused courses

Courses in this group have the DCDF attribute.

Course	Title	Credits
CISC 5450	Mathematics for Data Science	3
CISC 5500	Data Analytics Tools and Scripting	3
CISC 5900	Information Fusion	3

CISC 5950	Big Data Computing	3
CISC 6525	Artificial Intelligence	3
CISC 6745	Data Visualization	3