SIU CARBONDALE Southern Illinois University

Table of Contents

Cybersecurity and Cyber Systems

Admission

Applicants with a bachelors degree in Computer Science, Engineering, Physics, Mathematics, Information Systems or equivalent degrees will be admitted directly as long as their GPA satisfies Graduate School requirements. The M.S. degree requires 30 credit hours. Students can select among the concentrations in cybersecurity or in cyber systems. For applicants lacking the required specific background, we offer conditional admission status until completing prerequisite courses.

Admission to the M.S. program is based on the following factors: grade point average of 2.75 or higher on a scale of 4.0 on approximately the last 60 semester hours of undergraduate coursework, class ranking, and faculty recommendation letters. Although GRE scores are not required for admission, they are important to qualify for the High Achievers Tuition Rate. See also tuition.siuc.edu/highachievers2.html. The minimum TOEFL score requirement for international applicants is 550 (paper-based) or 80 (computer-based).

The program requires a nonrefundable $65 application fee that must be submitted with the application for admissions to the M.S. program in Cybersecurity and Cyber Systems. Students must apply online and pay this fee by credit card. Please address any correspondence to “Master of Science Program in Cybersecurity and Cyber Systems,” 1230 Lincoln Drive, Southern Illinois University Carbondale, Carbondale, Illinois 62901, Mailcode 6603 or Mailcode 4511. Inquiries can be addressed to cyberms@siu.edu. For telephone inquiries please call 618-536-2364 or 618-536-2327, and refer to the Master of Cybersecurity and Cyber Systems Program. The facsimile numbers are 618-453-7972 and 618-453-6044.

Retention

Any student whose cumulative grade point average falls below 3.0 on courses that count towards the degree will be placed on departmental academic probation. Any graduate student on academic probation whose grade point average remains below 3.0 on courses that count towards the degree for two consecutive semesters in which she or he is enrolled will be permanently suspended from the program, unless the department grants an exception.

Curriculum

The degree requires 3 courses from 3 key areas that will ascertain understanding of fundamentals and help build a solid foundation for the remainder of the program. These courses are listed below.

1. **Fundamentals in computer security**. This requirement will be completed by either CS 410 or ECE 434. Only one of these courses will count towards the degree.
2. **Fundamentals in systems programming**. This requirement will be completed by either CS 407 or ECE 536. Only one of these courses will count towards the degree.
3. **Fundamentals in network systems**. This requirement will be completed by either CS 440 or ECE 553. Only one of these courses will count towards the degree.

A student should then seek a concentration either in cybersecurity or in cyber systems by selecting at least 5 elective courses in cybersecurity or in cyber systems. The lists of these courses are given below. A maximum of six credit hours from academic units outside the Department of Electrical and Computer Engineering or the Department of Computer Science could be applied towards the degree.

In cybersecurity concentration, students must complete 4 courses in cybersecurity and 1 course in cyber systems. In cyber systems concentration, students must complete 4 courses in cyber systems and 1 course in cybersecurity. A fundamental area may be satisfied by a course that was taken prior to admission or a documented record of accomplishment in the subject matter content. In this case, the student must select an additional elective course either in cybersecurity or in cyber systems for each satisfied fundamental area. Students must take at least two CS/ECE five hundred level courses not cross listed to a four hundred level course. Students must take at least three ECE and at least three CS courses. Only three credit hours of ECE 592 or CS 598 can count towards the degree.

MS Thesis option: 6 credit hours of thesis in ECE or CS (ECE 599 or CS 599) may substitute for 6 credit hours in a concentration area.

List of cybersecurity courses for the MS degree: CS 408, CS 409, CS 413, CS 415, ECE 418, ECE 517, ECE 518, ECE 519, CS 525, CS 531.

List of cyber system courses for the MS degree: ECE 417, ECE 419, CS 425, ECE 431, CS 441, ECE 475, ECE 512, ECE 528, ECE 536, CS 540, ECE 541.

Cybersecurity and Cyber Systems Courses

Cybersecurity and Cyber Systems Faculty

Ahmed, Khaled, Assistant Professor, Ph.D., Tokyo Institute of Technology, 2004; 2019. High-performance computing, distributed and parallel computing, peer-to-peer computing, big data, machine learning, and image processing.

Carver, Norman F., III, Associate Professor, Ph.D., University of Massachusetts, 1990; 1995. Multi-agent systems, sensor interpretation, machine learning.

Che, Dunren, Professor, Ph.D., Beijing University of Aeronautics and Astronautics, Beijing China, 1994; 2001. Database, data mining, cloud computing, big data management and analytics.

Danhof, K. J., Professor, *Emeritus*, Ph.D., Purdue University, 1969; 1969.

Gupta, Bidyut, Professor, Ph.D., University of Calcutta, 1986; 1988. Distributed systems, fault-tolerant computing, mobile communication, routing algorithms, peer-to-peer networks.

Hexmoor, Henry, Associate Professor, Ph.D., University of Buffalo, 1996; 2006. Artificial intelligence, Multi-agent systems, cognitive science, mobile robotics, knowledge representation and reasoning.

Hou, Wen-Chi, Professor, *Emeritus*, Ph.D., Case Western Reserve University, 1989; 1989. Statistical databases, query optimization, data stream processing, spatial data structures, XML databases, big data.

Hoxha, Bardh, Assistant Professor, Ph.D., Arizona State University, 2017. Formal Methods, Testing and Verification of Cyber-Physical Systems, Motion Planning for Autonomous Vehicles, and Human-Robot Interaction.

Huang, Chun-Hsi, Professor and *School Director*, Ph.D., State University of New York at Buffalo, 2001; 2019. Extreme-scale computing and data analytics, computational biology, security and applied algorithmics.

Huang, Xiaolan, Assistant Professor, Ph.D., Southern Illinois University, 2017; 2019. Bioinformatics, data mining, machine learning, network architecture, data communication and security.

Mark, Abraham M., Professor, *Emeritus*, Ph.D., Cornell University, 1947; 1950.

McGlinn, Robert J., Associate Professor, *Emeritus*, Ph.D., Southern Illinois University Carbondale, 1976; 1981.

Mogharreban, Namdar, Associate Professor, *Emeritus*, Ph.D., Southern Illinois University Carbondale, 1989; 1999.

Phillips, Nicholas C.K., Associate Professor, *Emeritus*, Ph.D., University of Natal, 1967; 1988.

Rekabdar, Banafsheh, Assistant Professor, Ph.D., University of Nevada, 2017. Artificial Intelligence, Machine learning, Deep learning, Data mining, big data analytics, Robotics.

Sinha, Koushik, Assistant Professor, Ph.D., Jadavpur University, 2007; 2015. Mobile and wireless sensor networks, cloud computing and social computing, resource allocation and task scheduling.

Wainer, Michael S., Associate Professor, *Emeritus*, Ph.D., University of Alabama at Birmingham, 1987; 1988.

Wright, William. E., Professor, *Emeritus*, D.Sc., Washington University, 1972; 1970.

Last updated: 07/13/2020

Southern Illinois University
Carbondale, IL 62901
Phone: (618) 453-2121

Catalog Year Statement:
Students starting their collegiate training during the period of time covered by this catalog (see bottom of this page) are subject to the curricular requirements as specified herein. The requirements herein will extend for a seven calendar-year period from the date of entry for baccalaureate programs and three years for associate programs. Should the University change the course requirements contained herein subsequently, students are assured that necessary adjustments will be made so that no additional time is required of them.