CYBERSECURITY, PH.D.

Program Overview

Admissions Requirements

Applicants to the **Doctor of Philosophy Degree in Cyber-Physical Systems** must meet the General Admissions Requirements as published in this Catalog. GRE required.

Student Learning Outcomes

On completion of their Ph. D. in Cyber-Physical Systems, students will be able to:

- Identify and solve new problems arising in the discipline of Cyber-Physical Systems, and in their chosen specialization in creative and innovative ways
- Conduct ethically and scientifically valid research in the discipline of Cyber-Physical Systems, and in the chosen specialization
- Conduct and manage research in the discipline of Cyber-Physical Systems, and related multi-disciplinary research collaboratively
- Participate in research and development through established frameworks provided by Governmental and Corporate research organizations

Degree Requirements

In addition to the General Degree Requirements published in graduate Catalog, students pursuing the **Doctor of Philosophy in Cyber-Physical Systems** must complete a minimum of 15 credit hours of core courses, 15 credit hours of concentration courses, 9 hours of general CPS electives, 3 hours of graduate seminar, and 12 hours of dissertation research.

I. Core Courses (15 Credits)

Code	Title	Hours
CCIS 671	Algorithm Design & Analysis	3
CCIS 672	Computer Organization	3
CCIS 673	Operating Systems Design	3
CCIS 674	Database Design	3
CCIS 691	Software Engineering I	3

II. Concentration: Cybersecurity (15 Credits)

Code	Title	Hours
CCIS 516	Data Analytics for Cybersecuri	3
CCIS 721	Data Security	3
CCIS 723		3
CCIS 724	Information Assurance	3
CCIS 722	Computer Forensics	3

Or

Concentration: Artificial Intelligence and Robotics (15 Credits)

Code	Title	Hours
CCIS 675	Artificial Intelligence	3
CCIS 712	(Computer Vision)	3
CCIS 713	(Robotics)	3
CCIS 715	(Pattern Recognition)	3
CCIS 735	(Knowledge-Intensive Systems)	3

III. Cyber-Physical Systems Electives (General): (9 Credits)

IV. Graduate Seminar (4 credits)

The Graduate Seminar will be a 1 credit hour/semester course. The student will be expected to participate in 4 graduate seminars during the program.

V. Dissertation Research (12 credits)

The student who has completed the Course Requirements, and successfully passed the Qualifying Examination, will take 3 credit hours of Dissertation Research each semester for 4 four semesters.

Cyber-Physical Systems, Ph.D. - Specialization: Artificial Intelligence & Robotics

Course	Title	Hours
First Year		
First Semester		
CCIS 671	Algorithm Design & Analysis	3
CCIS 673	Operating Systems Design	3
CCIS 672	Computer Organization	3
CCIS XXX	Graduate Seminar	1
	Hours	**10**
Second Semester		
CCIS 674	Database Design	3
CCIS 691	Software Engineering I	3
CCIS 675	Artificial Intelligence	3
CCIS XXX	Graduate Seminar	1
	Hours	**10**
Second Year		
First Semester		
CIS 712	Computer Vision	3
CCIS 713	Robotics	3
CCIS 715	Pattern Recognition	3
CCIS XXX	Graduate Seminar	1
	Hours	**10**
Second Semester		
CCIS 735	Knowledge Intensive Systems	3
CCIS XXX	CPS Elective	3
CCIS XXX	CPS Elective	3
CCIS XXX	Graduate Seminar	1
	Hours	**10**
Third Year		
First Semester		
CCIS XXX	CPS Elective	3
CCIS XXX	Research in AI & Robotics	3-12
CCIS XXX	Graduate Seminar	1
	Hours	**7-16**
Second Semester		
CCIS XXX	Graduate Seminar	1
CCIS XXX	Research in AI & Robotics	3-12
	Hours	**4-13**

Fourth Year

First Semester

Course	Title	Hours
CCIS XXX	Research in AI & Robotics	3
CCIS XXX	Graduate Seminar	1
	Hours	4

Second Semester

Course	Title	Hours
CCIS XXX	Dissertation Consultation	3
	Hours	3
	Total Hours	58-76

Cyber-Physical Systems, Ph.D. - Specialization: Cybersecurity

Course	Title	Hours
First Year		
First Semester		
CCIS 671	Algorithm Design & Analysis	3
CCIS 673	Operating Systems Design	3
CCIS 672	Computer Organization	3
CCIS XXX	Graduate Seminar	1
	Hours	10
Second Semester		
CCIS 674	Database Design	3
CCIS 691	Software Engineering I	3
CCIS 516	Data Analytics for Cybersecuri	3
CCIS XXX	Graduate Seminar	1
	Hours	10
Second Year		
First Semester		
CIS 721	Data Security	3
CCIS 723		3
CPS ELECTIVE		3
CCIS XXX	Graduate Seminar	1
	Hours	10
Second Semester		
CCIS 724	Information Assurance	3
CCIS 722	Computer Forensics	3
CCIS XXX	CPS Elective	3
CCIS XXX	Graduate Seminar	1
	Hours	10
Third Year		
First Semester		
CCIS XXX	CPS Elective	3
CCIS XXX	Research in Cybersecurity	3-12
CCIS XXX	Graduate Seminar	1
	Hours	7-16
Second Semester		
CCIS XXX	Graduate Seminar	1
CCIS XXX	Research in Cybersecurity	3-12
	Hours	4-13
Fourth Year		
First Semester		
CCIS XXX	Research in Cybersecurity	3-12
CCIS XXX	Graduate Seminar	1
	Hours	4-13
Second Semester		
CCIS XXX	Dissertation Consultation	3
	Hours	3
	Total Hours	58-85