CYBERSECURITY ANALYTICS AND OPERATIONS

Degree Requirements

Master of Professional Studies (M.P.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-700 Professional Degree Policies (http://gradschool.psu.edu/graduate-education-policies/).

The M.P.S. program requires a minimum of 33 credits, 24 of which must be earned at Penn State. A maximum of 9 transfer credits of high-quality graduate work may be applied toward the requirements for the degree, subject to restrictions outlined in GCAC-309 Transfer Credit (http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-309-transfer-credit/). At least 18 credits must be courses at the 500 or 800 level, with at least 6 credits at the 500 level.

The 33 credits are distributed among the following requirements. A student first takes 21 credits of core courses. The student then takes 9 credits of electives. Lastly, the student must complete a master's project guided by the student's adviser and completed while enrolled in IST 594.

Elective Courses

The elective courses for the M.P.S. will be selected from a list maintained by the program office.

Master'S Project

The project requires all students in the M.P.S. to focus on a well-defined issue or problem relevant to the information sciences and technology. The student will submit a project proposal to his/her faculty adviser for approval. Upon completion of the project, the student will share or present the project results at a final presentation as a component of IST 594.

Code	Title	Credits
Required Courses		
INSC 561	Web Security and Privacy	3
IST 451	Network Security	3
IST 456	Information Security Management	3
IST 543	Foundations of Software Security	3
IST 554	Network Management and Security	3
IST 815	Foundations of Information Security and Assurance	3
IST 820	Cybersecurity Analytics	3
Electives		
Select 9 credits of electives from a list of approved electives available from the program office.		9
Culminating Experience		
IST 594	Research Topics (Master's Project)	3
Total Credits		**33**

Master of Science (M.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (http://gradschool.psu.edu/graduate-education-policies/)

The M.S. in Cybersecurity Analytics and Operations requires a minimum of 30 credits at the 400, 500, 600, or 800 level, with at least 18 credits in the 500 or 600 series combined; 27 of the 30 credits must be earned at Penn State. Students will be able to complete the proposed Master's program in one calendar year (including summer) or two academic years. All of the courses listed below are three credit hour courses, unless otherwise noted. Students pursuing the one-year format must complete the non-thesis track (IST 594). In addition, the one-year M.S. track must adhere to the following conditions:

- Students must take at least one credit of research (IST 594) for each of the three semesters (Fall, Spring, and Summer).
- A research adviser must be assigned to students in their first semester, as selection and discussion of the student's research topic must begin as soon as possible.
- Students who need more time to complete the final paper must be allowed to complete the paper, and have it reviewed and approved after the third semester (Summer) has ended. Students are not required to remain in residence while they complete the final paper. However, extensions granted to students in this program must comply with the Graduate Council policy on deferred grades (https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-400/gcac-401-grading-system/).

These 30 credits are distributed among the following requirements:

Code	Title	Credits
Required Courses		
IST 543	Foundations of Software Security	3
IST 554	Network Management and Security	3
IST 815	Foundations of Information Security and Assurance	3
IST 820	Cybersecurity Analytics	3
INSC 561	Web Security and Privacy	3
Electives		
Choose 9-12 Credits from the following:		9-12
IST 451	Network Security	
IST 454	Computer and Cyber Forensics	
IST 456	Information Security Management	
IST 504	Foundations of Theories and Methods of Information Sciences and Technology Research	
IST 511	Information Management: Information and Technology	
IST 555	Intelligent Agents and Distributed Decision Making	
IST 557	Data Mining: Techniques and Applications	
IST 558	Data Mining II	
IST 564	Crisis, Disaster and Risk Management	
IST 816	Web Fundamentals	
IST 841	Search Engines & Information Retrieval	
IST 868	Topics in Visual Analytics for Security Intelligence	
Culminating Experience		
IST 594	Research Topics (Scholarly Paper)	6
or IST 600	Thesis Research	
Total Credits		**30**

Students can choose to complete a thesis or a scholarly paper as the culminating experience for the degree. Students who choose to complete a thesis must complete at least 6 credits in thesis research (IST 600 or

IST 610). The thesis must be accepted by the advisers and/or committee members, the head of the graduate program, and the Graduate School, and the student must pass a thesis defense. Students in the non-thesis track must write a satisfactory scholarly paper while enrolled in IST 594 and complete at least 18 credits at the 500 level.