

# 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 (<https://gradschool.psu.edu/graduate-education-policies/>).

The M.P.S. program requires a minimum of 33 credits at the 400, 500, or 800 level, 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-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 18 credits of core courses. The student then takes 12 credits of electives. Lastly, the student must complete a culminating experience.

#### Elective Courses

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

#### Culminating Experience

The student may choose one of two culminating experiences for the degree: either the capstone project guided by the student's adviser and completed while enrolled in IST 594, or the capstone course IST 894.

Code	Title	Credits
<b>Required Courses</b>		
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
IST 825	Technologies for Web and E-Commerce Application Security	3
IST 830	Cybersecurity Project Management	3
<b>Electives</b>		
Select 12 credits of electives from a list of approved electives available from the program office.		12
<b>Culminating Experience</b>		
Choose one of the following:		3
IST 594	Research Topics (Capstone Project)	
IST 894	Capstone Experience (Capstone Course)	
<b>Total Credits</b>		<b>33</b>

### Master of Science (M.S.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://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 (refer to GCAC-309 Transfer Credit (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-309-transfer-credit/>)). 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 adhere to the following conditions:

- 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
<b>Required Courses</b>		
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
IST 825	Technologies for Web and E-Commerce Application Security	3
<b>Electives</b>		
Select 9-12 elective credits from a list available from the program office.		9-12
<b>Culminating Experience</b>		
Choose one of the following:		
IST 584	Cyber Simulation Event and Analysis	3
IST 594	Research Topics (Scholarly Paper)	3-6
IST 600	Thesis Research	6
<b>Total Credits</b>		<b>30</b>

#### Thesis, Scholarly paper, or Capstone course (3-6 credits)

Students may choose a thesis, scholarly paper or capstone course option. Students who choose the thesis option must register for 6 credits of IST 600 or IST 610, write a satisfactory thesis accepted by the master's committee, the head of the graduate program, and the Graduate School, and pass a thesis defense. The thesis should focus on a well-defined problem relevant to the information sciences. Students who choose the thesis option must also complete IST 505. Student who choose the scholarly paper option must register for 3 credits of IST 594 and complete the scholarly paper. The scholarly paper will be a focused piece of technical work that applies the student's expertise and knowledge base, and that is documented and presented as a scholarly paper report. Students who choose the capstone course option must register for IST 584 to complete the capstone course requirement. Students who choose the scholarly paper option or capstone course option must complete at least 18 credits at the 500 level.