

CYBERSECURITY, PHD

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Overview

Program added on August 4, 2026. This new program has been approved with an initiation term of Fall 2026.

Admissions & Policies

Admissions

Admission is competitive. An undergraduate degree in engineering, computer science, operations research, mathematics, or the physical sciences is typically required for admission. The undergraduate preparation should include, at a minimum, calculus, differential equations, linear algebra, discrete structures, probability, and statistics, in addition to computational proficiency.

Specific application requirements and deadlines can be found at <https://cec.gmu.edu/application-requirements-and-deadlines>.

International applicants are referred to the university's English Proficiency Requirements. In addition, international transcripts must be translated and evaluated (course-by-course preferred) by a member of the National Association of Credential Evaluation Services (NACES). Transcripts can be evaluated by George Mason University at no extra cost to the applicant, but may take additional processing time. Please review George Mason University's Policy on International Transcript Submission. Applications must be completed and submitted before an admission decision is made.

Admission to the PhD in Cyber Security Engineering will also depend on alignment with CYSE faculty research expertise and the applicant's primary area of interest.

Policies

The AP.6.10 (<https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-10>) Requirements for Doctoral Degrees apply to this program. For policies governing all graduate programs, see AP.6 Graduate Policies (<https://catalog.gmu.edu/policies/academic/graduate-policies/#header>).

Transfer of Credit

Up to 24 credits of graduate coursework successfully completed prior to admission to the PhD program may be counted toward the elective portion of required coursework. Please see AP.6.5 for more information.

Requirements

Degree Requirements

Total Credits: 72

Students must complete a minimum of 72 graduate credits. Of the 72 total credits required for degree completion, 48 credits must be coursework, and 24 credits must be research.

Core Courses

Code	Title	Credits
CYSE 700	Research Methodology and Pedagogy in Cybersecurity	3
CYSE 710	Advanced Networks and Cybersecurity	3
CYSE 757	Cyber Law	3
CYSE 780	Advanced Hardware and Cyber-Physical Systems Security	3
CYSE 787	Cyber Security Systems Engineering	3
CYSE 789	Advanced Artificial Intelligence Methods for Cybersecurity	3
Total Credits		18

Restricted Electives

Code	Title	Credits
CYSE 760	Human Factors in Cyber Security	3
CYSE 770	Fundamentals of Operating Systems	3
Total Credits		6

Electives

Code	Title	Credits
Students will choose the remaining coursework from the following:		0-24
CYSE 640	Wireless Network Security	
CYSE 650	Topics in Cyber Security Engineering	
CYSE 698	Independent Study and Research	
CYSE 750	Advanced Topics in Cyber Security Engineering	
CYSE 765	Quantum Information Processing and Security	
CYSE 785	Advanced Unmanned Aerial Systems Security	
CYSE 890	Verification and Validation of System Security	
CYSE 891	Formal Methods for Learning Systems Assurance	
OR 719	Graphical Models for Inference and Decision Making	
Other CEC courses, with approval of faculty advisor/dissertation director		
Total Credits		0-24

Research

Code	Title	Credits
Select 24 credits from the following:		24
CYSE 998	Doctoral Dissertation Proposal (3-12 credits)	
CYSE 999	Doctoral Dissertation (a minimum of 12 credits)	
Total Credits		24

Faculty Advisement

On admission to the Cybersecurity, PhD program, students are assigned an initial Faculty Advisor whose research area aligns with the student's expertise, as identified in their application. The initial Faculty Advisor advises on and approves the student's Plan of Study with final approval from Cybersecurity.

Ultimately, all Cybersecurity students require a Dissertation Director who will direct their PhD studies, including their dissertation research. The Dissertation Director may or may not be the Faculty Advisor assigned to the student at the time of admission to the program. This arrangement, by mutual consent of the student and Dissertation Director, should be agreed on well before the student begins their research. Cybersecurity, PhD Dissertation Directors must be members of the Mason graduate faculty with an academic appointment of at least 50% within Cybersecurity.

Topics of potential research are determined by the expertise and interests of the faculty. The student is responsible for identifying, communicating and offering proof of their research skills to the faculty under whom they wish to work. A student's engagement, excitement, commitment, relevant academic and non-academic background, and initiative are all attributes a potential Dissertation Director will consider before making the decision to formally commit.

Dissertation Directors and their students should arrive at an understanding of the Dissertation Director's expectations. This must include a clear understanding of the research topic and the courses the student must complete in support of that research. It should also include, at a minimum, a timeline for the overall planned program of study, expectations regarding technical publications and presentations arising from the research, availability of graduate student support, advising style, and the location where the student will conduct the research and when. A successful dissertation depends on shared understanding.

Students wishing to change Dissertation Directors are required to recruit a new Dissertation Director to direct their research. Changing Dissertation Directors usually slows academic progress. Dissertation Directors also have the right to decline or to discontinue supervising students.

Plan of Study

The Faculty Advisor works with the student to develop a Plan of Study in consultation with, and subject to approval by the Chair of the Graduate Committee. This Plan is a formal document that specifies coursework in support of the student's research interests, in addition to meeting degree requirements.

A student's area of research interest may shift during their studies. This may lead to revisions in the Plan of Study, subject to the approval of the Faculty Advisor and the Chair of the Graduate Committee. Revisions may also lead to a change in Faculty Advisor, subject to alignment with CYSE faculty research expertise and capacity of the proposed faculty to advise additional PhD students. A shift in the Faculty Advisor requires formal agreement of the proposed faculty advisor and official approval by the Chair of the Graduate Committee.

Students are responsible for keeping their plan of study current before the beginning of each semester and getting approval for any changes to the plan.

Written Qualifying Exam

Students must pass a written qualifying exam designed to test fundamental knowledge. The exam is based on the six required core courses. The qualifying exam is offered twice a year during the fall and spring semesters. Students will send an intent to participate in an exam using a request form submitted to the Chair of the Graduate Committee. The requirements of the written exam are posted on the department's website.

Students must attempt the qualifying exam no later than the first opportunity following the completion of 18 credits, or 30 credits, if the student enters the program without a Master's degree.

Each student must pass the exam in two consecutive offerings. A student who fails to take the qualifying exam after meeting the credit thresholds noted above or does not pass the qualifying exam in two consecutive semesters is subject to termination from the program.

Dissertation Proposal

The PhD dissertation research is the signature accomplishment for the PhD and represents a definitive contribution to knowledge in a field of research. The research is conducted under the supervision of the student's Dissertation Director, which may or may not be the student's initial Faculty Advisor. Procedures for identifying a Dissertation Director are outlined under Faculty Advisement.

After a student completes the core and concentration coursework and has the approval of their Dissertation Director, they are required to submit the Dissertation Progress Report form every semester to obtain the appropriate section of CYSE 998 Doctoral Dissertation Proposal. During this stage, students must formalize their dissertation committee with the approval of their Dissertation Director and Chair of the Department.

Dissertation Committee

After a student and their Dissertation Director agree to work together, the dissertation committee can be formed. This committee administers the dissertation proposal presentation evaluation and final defense by submitting the appropriate approval forms to CYSE. Dissertation Committee membership must be approved by the CYSE Graduate Committee.

As explained above, the dissertation committee is chaired by the Dissertation Director, who must be a member of the Mason graduate faculty with an academic appointment of at least 50% within CYSE. The committee may also include a Dissertation co-Director, who must also be a member of the Mason graduate faculty, but who may have an academic appointment outside

CEC. The dissertation committee must also include at least three other faculty members of the Mason graduate faculty. At least two CEC departments must be represented on the committee. Representatives from industry or government with key, related doctoral-level expertise may also be considered if they have been appointed to university graduate faculty status.

Dissertation Proposal Presentation

In the semester a student registers for their twelfth credit of CYSE 998 Doctoral Dissertation Proposal sequence, the student must present a written dissertation proposal to their dissertation committee. Students may attempt the presentation twice, within the same semester/term. If approved by the Dissertation Director and dissertation committee, formal paperwork is submitted and the student will be advanced to candidacy. Failure to attempt the proposal presentation during the semester/term in which the student registers for their twelfth credit of CYSE 998 Doctoral Dissertation Proposal or failure on a second attempt will result in termination from the program.

Advancement to Candidacy

After successful completion of the dissertation proposal presentation, the student is formally advanced to candidacy for the PhD degree, pending submission to CYSE on a standard Registrar Form. Advancement to Candidacy Time Limits can be found in AP.6.10.1.

Dissertation Sequence

Once advanced to candidacy, the student must register for CYSE 999 Doctoral Dissertation and maintain continuous registration in CYSE 999 Doctoral Dissertation through to completion of the program and all graduation requirements. This includes completion of the dissertation and its successful defense with approval by the dissertation committee and submission to the university library meeting all their requirements.

Failure to maintain continuous registration in CYSE 999 Doctoral Dissertation every semester (fall/spring) will result in termination, unless on a leave of absence. Continuous registration does not include summers, except for when degree conferral occurs in August. For more information see AP.6.10.6.

Dissertation Final Defense

Once admitted to candidacy, students proceed with their dissertation research. Students are encouraged to draw on the expertise and guidance of their dissertation committee during their research, including submission of a draft dissertation to the committee members. When the PhD student's research is complete to the satisfaction of the Dissertation Director, the student may submit the written dissertation to the dissertation committee.

The oral defense of the research is scheduled when the entire dissertation committee, inclusive of the Dissertation Director believe the student has completed research that makes a definitive contribution to knowledge, sufficient to meet their expectations for awarding the PhD. The student must successfully defend their dissertation research in a final public oral defense, announced at least two weeks before the defense, AP.6.10.8. The committee or the student can request a

committee-only pre-defense to provide feedback to the student, but this cannot substitute for the public oral defense.

The entire dissertation committee must be present at the final oral defense, unless an exception is approved by the CYSE Department Chair beforehand. If the candidate successfully defends their dissertation research, the dissertation committee recommends that the final form of the dissertation be completed, and the CEC faculty and the graduate faculty of Mason accept the candidate for the PhD degree. At that point, the student submits to the university library a final publishable dissertation that meets university guidelines.

If the student fails to successfully defend the dissertation research, the student may request a second public oral defense, following the same procedures as for the initial public oral defense. There is no time limit for this request other than general time limits for the doctoral degree (AP.6.10.1). Students are strongly advised to consult with their Dissertation Director and dissertation committee before scheduling a second defense. If the student fails on the second attempt to defend the dissertation, the student will be terminated from the CYSE program without being awarded the PhD.

Program Outcomes

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Students in this Ph.D. program will gain academic and research experience in cyber security engineering from a holistic perspective that encompasses (a) technical competencies in computer and network security, hardware security, secure artificial intelligence (AI) infrastructure design, and attack-resilient systems design, (b) policy-making expertise through a deeper understanding of cyber laws and practices, and (c) ability to integrate human factors in cyber systems design. The program will prepare students for international, national, and local employment in academia, government, contractors, think tanks, and non-government organizations.