Computer Security

Program of Study

A specialization in computer security is available within the master's degree program of the Computer Science (CS) Department.

Students enrolled in this specialization will receive the master of science degree in computer science, with a notation on their transcript "Specialization in Computer Security." The program is focused on preparing students for both industrial positions and Ph.D. study related to computer security.

WPI's cyber-security programs place the science and engineering of security within the broader holistic frameworks of institutions and society. The specialization in Computer Science prepares students to approach technical computer security problems in the context of users and organizations. The M.S. specialization in computer security strives to produce students who

- can assess which security-related threats to address in a computing problem
- understand technical security vulnerabilities and technologies at least two different abstraction levels within computing systems
- appreciate behavioral and human factors in creating feasible security systems

Admission Requirements

The program is conducted at an advanced technical level and requires, in addition to the WPI admissions requirements, a solid background in computer science (CS). Normally a B.S. degree in CS is expected; however, applicants with comparable backgrounds, together with expertise gained through work experience, will also be considered. Interested students should apply to the CS master's degree program. Admission decisions are made by the CS department.

Degree Requirements

33 credits

The Computer Security specialization has both coursework-only and thesis options. The program distribution requirements are as follows:

- Security Core: 6 credits
- Security Electives: 6 credits for the coursework option, or 3 credits for the thesis option. At least one elective course must emphasize Behavioral Dimensions of security.
- Business/Management: 3 credits
- Computer Science Bins: 12 credits
- Either 6 credits of general CS electives (coursework option) or 9 credits of M.S. thesis (thesis option)

The following courses satisfy each requirement:

Security Core: Courses covering two of software, systems/networks, and wireless/internet level security. Current applicable courses are:

- CS 557 (Software Security Design and Analysis)
- CS 558 (Network Security)
- ECE 579W (Wireless and Internet Security)

Students with B.S./M.S. credit for CS 4401 (Software Security Engineering) or CS 4404 (Tools and Techniques in Computer Network Security) may apply at most one of these courses towards the security core requirement for the M.S. specialization.

Security Electives: Includes all security-related courses offered in Computer Science and Electrical and Computer Engineering. Up to three credits from thesis work on a security-related topic may count towards this requirement, with the approval of the specialization director. Current applicable courses are the security core courses as well as:

- CS 571 (Case Studies in Computer Security) [satisfies Behavioral Dimensions requirement]
- CS 578 (Cryptography)
- ECE 673 (Advanced Cryptography)
- CS 564 (Advanced Topics in Computer Security)
- Special topics courses with the approval of the specialization director

At least one course counted towards security electives must provide significant coverage of behavioral dimensions of cyber security. Permanent course offerings that satisfy the behavioral dimensions requirement are designated as such in their catalog descriptions. The instructors of topics courses (CS 525 and CS 5XX) and independent study courses may designate particular offerings as satisfying the behavioral requirement with the approval of the Specialization Director.

Business/Management: Courses covering business or management issues that bear on security concerns. Current applicable courses are:

- MIS 582 (Information Security Management)
- OIE 542 (Risk Management and Decision Making)

Computer Science Bins: Courses as required to satisfy the breadth requirements ("bins") for the CS M.S. degree. Details appear in the CS M.S. degree requirements.

Electives: Any courses allowable within the requirements for CS M.S. degrees, including thesis credits.

Thesis Approval: If a student applies thesis credits towards a degree bearing the computer security specialization, his or her thesis topic must be approved as security-related by one of the core specialization faculty. Theses need not be advised by core specialization faculty; in such cases, the reader should be one of the core specialization faculty.

Important Note

Since the security specialization is within the master's programs of the Computer Science Department, students in this specialization must also satisfy all requirements of the computer science master's program. There is a limit to the number of courses outside of Computer Science that students may apply towards their Computer Science master's degree.