***Twin Cities Campus***

# Security Technologies M.S.S.T.

*Technological Leadership Institute*

**College of Science and Engineering**

Link to a list of faculty for this program.

**Contact Information:**
Security Technologies Graduate Program, Technological Leadership Institute, University of Minnesota,
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- Program Type: Master's
- Requirements for this program are current for Spring 2019
- Length of program in credits: 32
- This program requires summer semesters for timely completion.
- Degree: Master of Science in Security Technologies

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The master of science in security technologies (MSST) shapes tomorrow's analytical and risk management policy makers and innovators through a multi-disciplinary graduate program developed in response to growing demand in many levels of industry and government. During the 14-month program and through a multidisciplinary systems approach, the program synthesizes core learning in four areas: security methods and foundations; application expertise (including cyber, bio, food, infrastructure, global supply chains); systems science (interdependency among critical networks, components, human capital, organizational dimensions); and social and policy dimensions. Through elective courses, students also choose a learning track in either security systems technologies or security risk management. Students can further specialize through a range of elective courses. This program bridges disciplines to address local, regional, national, and global areas of need, seeding innovative capabilities while enabling interdisciplinary connections through direct links to industry, business, and government partners.

## Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

## Prerequisites for Admission

The preferred undergraduate GPA for admittance to the program is 3.00.

A bachelor's degree in a related field, e.g. in biological or physical sciences, engineering, computer science, mathematics, statistics, social sciences, or public policy.

Other requirements to be completed before admission:
Applicants should have one year of calculus, probability/statistics, or two science or engineering courses.

**Special Application Requirements:**
Applications are accepted on a rolling basis for the program's start in the summer of each year. Additional information is available at msst.umn.edu.

International applicants must submit score(s) from one of the following tests:

- TOEFL
  - Internet Based - Total Score: 79
  - Internet Based - Writing Score: 21
  - Internet Based - Reading Score: 19
  - Paper Based - Total Score: 550
- IELTS
  - Total Score: 6.5
- MELAB
  - Final score: 80

Key to test abbreviations(TOEFL, IELTS, MELAB).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

## Program Requirements

**Plan B:** Plan B requires 26 major credits and 6 credits outside the major.The final exam is written and oral. A capstone project is required.
**Capstone Project:** The Plan B project is an independent applied investigation on a relevant issue in security technologies or homeland security.

This program may be completed with a minor.

Use of 4xxx courses towards program requirements is not permitted.

A minimum GPA of 3.25 is required for students to remain in good standing.

The MSST program requires 32 credits in the fields of systems risk analysis, engineering (hardware and software), emerging technologies, economics, human factors, law, food and bio safety, and public policy to teach and investigate security technologies and address pertinent issues. The 32 credits consist of 24 credits in MSST core courses, 2 credits for the capstone course, and 6 credits in electives outside the major.

**Core Courses**

Take 0.5 credits of ST 8440
ST 8109 - Cybersecurity Foundations - Technology, Risk & Communication (2.0 cr)
ST 8110 - Security Science and Technology Foundations (3.0 cr)
ST 8111 - Methods, Theory, and Applications (2.5 cr)
ST 8113 - Information and Cyber Security (2.0 cr)
ST 8220 - Vulnerability, Risk and Threat Assessment and Management (2.5 cr)
ST 8221 - Communications of Risk and Security (1.0 cr)
ST 8330 - Critical Infrastructure Protection (2.5 cr)
ST 8331 - Dynamic Systems Modeling and Simulation Tools (2.0 cr)
ST 8440 - Security Practicum (0.5 - 2.0 cr)
ST 8510 - Psychology/Behavior Intelligence for Homeland Security (2.0 cr)
ST 8511 - Public Policy (1.0 cr)
ST 8512 - Partnership in Conflict Management: Security/Privacy Law, Social Responsibility and Ethics (2.0 cr)

**Capstone Project**

Take a total of 2 credits
ST 8620 - Capstone (0.5 - 2.0 cr)

**Electives**

Other courses may be selected in consultation with the director of graduate studies.
Take 6 or more credit(s) from the following:
•CI 5301 - Foundations of Computer Applications for Business and Education (3.0 cr)
•CSCI 5221 - Foundations of Advanced Networking (3.0 cr)
•CSCI 5271 - Introduction to Computer Security (3.0 cr)
•CSCI 5471 - Modern Cryptography (3.0 cr)
•CSCI 8715 - Spatial Data Science Research (3.0 cr)
•ESPM 5604 - Environmental Management Systems and Strategy (3.0 cr)
•FNRM 5131 - Geographical Information Systems (GIS) for Natural Resources (4.0 cr)
•GEOG 5561 - Principles of Geographic Information Science (4.0 cr)
•GEOG 5563 - Advanced Geographic Information Science (3.0 cr)
•GEOG 5564 - Urban Geographic Information Science and Analysis (3.0 cr)
•GIS 5574 - Web GIS and Services (3.0 cr)
•GIS 5577 - Spatial Database Design and Administration (3.0 cr)
•IDSC 6041 - Information Technology Management (2.0 cr)
•IDSC 6051 - Information Technologies and Solutions (2.0 cr)
•IDSC 6423 - Enterprise Systems (2.0 cr)
•IDSC 6444 - Business Analytics for Managers I (2.0 cr)
•IDSC 6481 - Managerial Decision Making (2.0 cr)
•IDSC 8003 - Accounting and Information Systems (4.0 cr)
•LAW 6022 - LL.M. Legal Writing and Legal Skills II (3.0 cr)
•LAW 6103 - Data Privacy Law (3.0 cr)
•LAW 6705 *{Inactive}*(2.0 cr)

- LAW 6832 - Cybercrime and Cybersecurity (2.0 cr)
- MATH 5248 - Cryptology and Number Theory (4.0 cr)
- MATH 5251 - Error-Correcting Codes, Finite Fields, Algebraic Curves (4.0 cr)
- MGMT 6004 - Negotiation Strategies (2.0 cr)
- MGMT 6034 - Strategic Leadership (2.0 cr)
- MGMT 6084 - Management of Teams (2.0 cr)
- MGMT 6402 - Integrative Leadership: Leading Across Sectors to Address Grand Challenges (3.0 cr)
- OLPD 5611 - Facilitation and Meeting Skills (1.0 cr)
- OLPD 5619 - Planning and Decision-Making Skills (1.0 cr)
- OLPD 6402 - Integrative Leadership: Leading Across Sectors to Address Grand Challenges (3.0 cr)
- PA 5011 - Dynamics of Public Affairs Organizations (3.0 cr)
- PA 5105 - Integrative Leadership: Leading Across Sectors to Address Grand Challenges (3.0 cr)
- PA 5405 - Public Policy Implementation (3.0 cr)
- PA 5701 *{Inactive}*(3.0 cr)
- PA 5711 - Science, Technology & Environmental Policy (3.0 cr)
- PA 5741 - Risk, Resilience and Decision Making (1.5 cr)
- PA 5822 *{Inactive}*(3.0 cr)
- PA 8201 *{Inactive}*(4.0 cr)
- PA 8821 *{Inactive}*(3.0 cr)
- POL 5885 *{Inactive}*(3.0 cr)
- POL 8402 - International Security (3.0 cr)
- PUBH 6232 - Emergency Preparedness: A Public Health Perspective (2.0 cr)
- PUBH 6112 - Environmental Health Risk Assessment: Application to Human Health Risks from Exposure to Chemicals (2.0 cr)
- PUBH 6123 - Violence Prevention and Control: Theory, Research, and Application (2.0 cr)
- PUBH 6182 - Emerging Infectious Disease: Current Issues, Policies, and Controversies (3.0 cr)
- PUBH 6571 - Quality, Patient Safety, and Performance Improvement (2.0 cr)
- PUBH 6702 - Integrative Leadership Seminar (3.0 cr)
- PUBH 7214 - Principles of Risk Communication (1.0 cr)
- PUBH 7221 - Planning for Urgent Threats (1.0 cr)
- PUBH 7223 - Concepts of Disaster Behavioral Health (1.0 cr)
- PUBH 7225 - Communication and Information Technology Tools for Public Health Emergency Response (1.0 cr)
- PUBH 7227 - Incident Management Systems: The Public Health Role (1.0 cr)
- PUBH 7230 - Topics in Infectious Disease (0.5 - 4.0 cr)
- PUBH 7233 - Food System Defense: Vulnerabilities in the Food System (1.5 cr)
- PUBH 7242 - War and Public Health (1.0 cr)
- SCO 6059 - Quality Management and Lean Six Sigma (4.0 cr)
- SCO 8892 - Readings in Supply Chain and Operations (1.0 - 8.0 cr)
- SOC 8412 - Social Network Analysis: Theory and Methods (3.0 cr)
- ST 8200 - Special Topics in Security Technologies (0.5 cr)
- ST 8441 - Internship (optional) (0.5 cr)
- VMED 5920 - Food Defense: Prepare, Respond, Recover (3.0 cr)
- WRIT 5001 - Foundations and Futures of Technical Communication (3.0 cr)
- WRIT 5112 - Information Design: Theory and Practice (3.0 cr)
- WRIT 5561 - Editing and Style for Technical Communicators (3.0 cr)
- **Special Topics Electives**

The following electives are topics courses. Only the approved topic titles below may be used.

- CSCI 5980 - Computation Geo-Informatics (3 credits)

HIST 5900 - European Nationalism and National Identity (3 credits)
IDSC 6490 - Information-Based Goods in the Network Economy (2 credits)
PA 5190 - Managing Conflict: Negotiation (3 credits)
PA 5890 - International Crisis Simulation (1 credit)
PA 5920 - Action-Oriented Strategy Mapping (1 credit)
PA 5920 - Assessing Leadership Capability (1 credit)
PA 5920 - Stakeholder/SWOT Analysis and Casual Mapping (0.5 credits)
PA 8790 - Risk Analysis for Science and Technology Policy (3 credits)
PUBH 7200 - Best Practices in Emergency Response (1 credit)
PUBH 7200 - Data Driven Decision-Making (1 credit)
PUBH 7200 - Design for Disaster (1 credit)
PUBH 7200 - Disaster 101 (1 credit)
PUBH 7200 - Epidemiology of Foodborne Pathogens (1 credit)
PUBH 7200 - Farm to Table Study Program (2 credits)
PUBH 7200 - Food Defense: Vulnerabilities in Food System and How to Close Them (1 credit)
PUBH 7200 - Food Facility Bio-Security: Cleaning and Sanitation for Food Facilities (1 credit)
PUBH 7200 - Food Systems Biosecurity Action Planning (1.5 credits)
PUBH 7200 - Using Risk Analysis Tools: Estimating Food Safety Risks on the Farm to Table Continuum (1 credit)