MANAGEMENT OF SECURE INFORMATION SYSTEMS (MSEC)

500 Level Courses

Provides an overview of the introductory topics in cyber security, which will be the basis for the other security-related in the MSIS. Topics include basic concepts on CIA (confidentiality, integrity, and availability), risk management, disaster recovery, access control, basic cryptography and software application vulnerabilities. Notes: 4 class sessions will be 3.5 hours long. 1 class session will be 2 hours and 20 minutes long. (5 classes; 16 hours and 20 minutes total) Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May not be repeated for credit.

Recommended Prerequisite: Admission to MSEC program.

Registration Restrictions:
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may not enroll.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

Provides the practices and methods currently used by information security professionals to manage and operate the secure IT infrastructures in the enterprise industry and in the US Federal Sector. It covers tools and knowledge required to design, execute, and/or evaluate the INFOSEC standards and procedures required of government and industry. The topic includes security operation center (SOC), network security, malware countermeasures, operational systems security, risk analysis and incident response practices. Notes: 4 class sessions will be 3.5 hours long. 1 class session will be 2 hours and 20 minutes long. (5 classes; 16 hours and 20 minutes total) Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May not be repeated for credit.

Recommended Prerequisite: MSEC 510.

Registration Restrictions:
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may not enroll.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

MSEC 520: Networking Principles. 2 credits.
Introduction to the principles guiding the design and operation of modern communication networks; using the structure provided by layered service models, this course explores systematically the architecture and protocols of large, decentralized networks. Topics include medium access control in local area networks, switching, routing, and addressing, reliable and secure transport, flow and congestion control. Throughout, examples are drawn from the suite of Internet protocols. Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May not be repeated for credit.

Recommended Prerequisite: Admission to MSEC program.

Registration Restrictions:
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may not enroll.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

600 Level Courses

MSEC 620: Networking Security. 2 credits.
Provides a comprehensive introduction to network security concepts and problems and the mechanisms and tools to secure networks. Focuses on the Internet, discusses the threats to and from the Internet and examines existing Internet security techniques and protocols and their limitations. Topics include secret key and public key cryptography, Hash algorithms, authentication, IPSEC/VPN, IPSEC key exchange, SSL/TLS, firewall, anonymous communication, and VoIP security. Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May not be repeated for credit.

Recommended Prerequisite: MSEC 510 and 520.

Registration Restrictions:
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may not enroll.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

MSEC 630: Secure Information System Governance, Regulation, and Compliance. 2 credits.
Provides insight into secure information system governance, regulations, and compliance including noteworthy legislation, regulations, and compliance issues as well as commonalities and significant differences
between departments and agencies within the Federal Executive Branch (FEB). The course is presented as formal lectures complemented by group discussion. Each topic is addressed as part of the larger Secure Information System structure. Notes: 4 class sessions will be 3.5 hours long. 1 class session will be 2 hours and 20 minutes. (5 total class sessions; 16 hours and 20 minutes total). Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May not be repeated for credit.

**Recommended Prerequisite:** MSEC 510

**Registration Restrictions:**
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may **not** enroll.

**Schedule Type:** Lecture

**Grading:**
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

**MSEC 641: Enterprise Security Threats.** 1 credit.
Provides a broad exposition of emerging cyber-security threats for large-scale enterprises: Denial of Service (DoS), insider attacks, remote exploitation. It covers defenses that may mitigate or curtail some aspects of these emerging security threats. Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May not be repeated for credit.

**Recommended Prerequisite:** MSEC 511.

**Registration Restrictions:**
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may **not** enroll.

**Schedule Type:** Lecture

**Grading:**
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

**MSEC 642: Enterprise Security Technologies.** 2 credits.
Provides an overview of enterprise security tools used in advanced security IT departments of enterprises today. In addition to understanding the tools, their capabilities, and their gaps, students participate in hands-on laboratory exercises with enterprise security tools. Notes: 4 class sessions will be 3.5 hours long. 1 class session will be 2 hours and 20 minutes long. (5 class sessions; 16 hours 20 minutes total) Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May not be repeated for credit.

**Recommended Prerequisite:** MSEC 511.

**Registration Restrictions:**
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may **not** enroll.

**Schedule Type:** Independent Study

**Grading:**
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

**MSEC 650: Seminar: Enterprise Security Case Studies.** 1 credit.
Provides an exposition of large enterprise security systems including operational requirements, threat model, security analysis, economic analysis, and defense posture options that expose the operational and economic trade-offs when architecting Enterprise security. Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May not be repeated for credit.

**Recommended Prerequisite:** MSEC 641.

**Registration Restrictions:**
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may **not** enroll.

**Schedule Type:** Seminar

**Grading:**
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

**MSEC 696: Directed Studies Management of Secure Information Systems.** 1-3 credits.
Approval by faculty member and program director required prior to registration. Studies specialized topics in business not otherwise available in the curriculum. Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May be repeated within the degree for a maximum 3 credits.

**Recommended Prerequisite:** Admission to the MSIS program or permission of the program director.

**Registration Restrictions:**
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may **not** enroll.

**Schedule Type:** Independent Study

**Grading:**
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)
**MSEC 697: Special Topics in Management of Secure Information Systems.** 1-3 credits.
Sections established as necessary to focus on various topical issues that emerge in practice of management of secure information systems. Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May be repeated within the term for a maximum 6 credits.

**Specialized Designation:** Topic Varies

**Recommended Prerequisite:** Admission to the MSIS program or permission of the program director.

**Registration Restrictions:**
Enrollment limited to students with a class of Advanced to Candidacy, Graduate, Non-Degree or Senior Plus.

Enrollment is limited to Graduate, Non-Degree or Undergraduate level students.

Students in a Non-Degree Undergraduate degree may not enroll.

**Schedule Type:** Lecture

**Grading:**
This course is graded on the Graduate Special scale. (http://catalog.gmu.edu/policies/academic/grading/)

---

**700 Level Courses**

**MSEC 710: Global Residency.** 1-4 credits.
Students spend a week in an international residency. Emphasis is on how other nations deal with management of secure information system, the management of those systems, and related public policy issues. Corporate site visits are combined with presentations by professors from universities outside the United States and relevant practitioners. Students are required to write a paper summarizing their observations and attend pre-residency preparatory sessions. Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May be repeated within the degree for a maximum 4 credits.

**Recommended Prerequisite:** Admission to Executive MS in Management of Secure Information Systems.

**Registration Restrictions:**
Enrollment is limited to Graduate or Non-Degree level students.

Students in a Non-Degree Undergraduate degree may not enroll.

Enrollment limited to students in the College of Science, Schar School of Policy and Gov or Volgenau School of Engineering colleges.

**Schedule Type:** Lecture

**Grading:**
This course is graded on the Graduate Regular scale. (http://catalog.gmu.edu/policies/academic/grading/)

---

**MSEC 720: Capstone Project in Management of Secure Information Systems.** 1-3 credits.
Teams undertake a strategic evaluation and plan for the management of secure information systems. They develop plans that include technical, organizational, and policy aspects. A report is produced and presented to the entire cohort for discussion. Offered by Volgenau School of Engineering (http://catalog.gmu.edu/courses/vse/). May be repeated within the degree for a maximum 3 credits. Equivalent to TECM 737.