INFORMATION SECURITY ASSURANCE (ISA)

500 Level Courses

**ISA 562: Information Security Theory and Practice.** 3 credits.
A technical introduction to the theory and practice of information security, which serves as the first security course for the MS-ISA degree, is required as a prerequisite for all subsequent ISA courses (at the 600 and 700 levels) and subsumes most topics covered by the CISSP examination. Also serves as an entry-level course available to non-ISA students, including MS-CS, MS-IS, and MS-SWE students. Offered by Computer Science. May not be repeated for credit.

**Recommended Prerequisite:** INFS 501, 515, 519, and SWE 510, or permission of instructor.

**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.

Enrollment limited to students in the Volgenau School of Engineering college.

**Schedule Type:** Lecture

**Grading:**
This course is graded on the Graduate Regular scale.

ISA 564: Security Laboratory. 3 credits.
Provides hands-on experience in configuring and experimenting with commodity-networked systems and security software in a live laboratory environment, with the purpose of understanding real-world security threats. Takes both offensive and defensive approaches and exposes students to a variety of real-world attacks, including viruses, worms, rootkits, and botnets. Possible mitigation and defending mechanisms, such as firewalls and intrusion detection software, also covered. Offered by Computer Science. May not be repeated for credit.

**Recommended Prerequisite:** ISA 562 and CS 531 or equivalent.

**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.

Enrollment limited to students in the Volgenau School of Engineering college.

**Schedule Type:** Laboratory

**Grading:**
This course is graded on the Graduate Regular scale.

600 Level Courses

**ISA 650: Security Policy.** 3 credits.
Focuses on security policy and its management for information systems having national and international connectivity. Issues include legal, international, cultural, and local factors. Students are expected to participate regularly in presenting material, in discussion of recent security issues, and by writing short papers on major current issues. Offered by Computer Science. May not be repeated for credit.

**Registration Restrictions:**
**Required Prerequisite:** ISA 562B.
B- Requires minimum grade of B-.

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.

Enrollment limited to students in the Volgenau School of Engineering college.

**Schedule Type:** Lecture

**Grading:**
This course is graded on the Graduate Regular scale.

ISA 652: Security Audit and Compliance Testing. 3 credits.
Presents the fundamental concepts of the IT-security audit and control process that is being conducted in a plethora of environments, including government, the financial industry, and the healthcare industry. The goal of this course is to enable the students to structure and perform audits based on the specifications of Sarbanes-Oxley, HIPAA, and FISMA audit programs. Covers all the CISA certification requirements in depth. Students completing the course are encouraged to attempt the certification exam on their own. Offered by Computer Science. May not be repeated for credit.

**Registration Restrictions:**
**Required Prerequisite:** ISA 562B.
B- Requires minimum grade of B-.

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.

Enrollment limited to students in the Volgenau School of Engineering college.

**Schedule Type:** Lecture

**Grading:**
This course is graded on the Graduate Regular scale.

ISA 656: Network Security. 3 credits.
An in-depth introduction to the theory and practice of network security. It assumes basic knowledge of cryptography and its applications in modern
network protocols. Studies firewalls architectures and virtual private
networks and provides deep coverage of widely used network security
protocols such as SSL, TLS, SSH, Kerberos, IPSec, IKE, and LDAP. It
covers countermeasures to distributed denial of service attacks, security
of routing protocols and the Domain Name System, e-mail security and
spam countermeasures, wireless security, multicast security, and trust
negotiation. Offered by Computer Science. May not be repeated for credit.

Registration Restrictions:
Required Prerequisites: (ISA 562B and INFS 612B) or CS 555B.
B Requires minimum grade of B.

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.

Enrollment limited to students in the Volgenau School of Engineering
college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

ISA 673: Operating Systems Security. 3 credits.
Covers fundamentals and advanced topics in operating system (OS)
security, including OS-level security mechanisms and policies in
investigating and defending against real-world attacks on computer
systems, such as self-propagating worms and large-scale botnets.
Basic OS security techniques, such as logging, system call auditing, and
memory protection, will be discussed. Recent advanced techniques,
such as honeypots and honeyfarms, system randomization, vulnerability
fingerprinting, and virtualization, will also be introduced. Offered by
Computer Science. May not be repeated for credit.

Recommended Prerequisite: ISA 562.

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.

Enrollment limited to students in the Volgenau School of Engineering
college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

ISA 674: Intrusion Detection. 3 credits.
Studies methodologies, techniques, and tools for monitoring events
in computer system or network, with the objective of preventing and
detecting unwanted process activity and recovering from malicious
behavior. Topics include types of threats, host-based and network-
based information sources, vulnerability analysis, denial of service,
deploying and managing intrusion detection systems, passive versus
active responses, and designing recovery solutions. Offered by Computer
Science. May not be repeated for credit.

Registration Restrictions:
Required Prerequisites: ISA 564B and 656B.
B Requires minimum grade of B.

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.

Enrollment limited to students in the Volgenau School of Engineering
college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

ISA 681: Secure Software Design and Programming. 3 credits.
Theory and practice of software security, focusing in particular on
some common software security risks, including buffer overflows, race
conditions and random number generation, and the identification of
potential threats and vulnerabilities early in the design cycle. Emphasis
is on methodologies and tools for identifying and eliminating security
vulnerabilities, techniques to prove the absence of vulnerabilities, and
ways to avoid security holes in new software and on essential guidelines
for building secure software. Explores how to design software with
security in mind from the ground up and integrate analysis and risk
management throughout the software life cycle. Offered by Computer
Science. May not be repeated for credit. Equivalent to SWE 681.

Recommended Prerequisite: SWE 619.

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.

Enrollment limited to students in the Volgenau School of Engineering
college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

ISA 697: Topics in Information Security. 1-6 credits.
Special topics in information security and assurance not occurring in
regular ISA sequence. Notes: May be repeated for credit when distinct
offerings of course differ in subject. Offered by Computer Science. May
be repeated within the term for a maximum 12 credits.

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.

Enrollment limited to students in the Volgenau School of Engineering college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

ISA 785: Research in Digital Forensics. 3 credits.
Focuses on research-related aspects of digital forensics including open problems in digital forensics, countermeasures against digital forensics, and fundamental and practical limitations of current digital forensics techniques. Also covers currently established techniques and tools for digital forensics as well as common legal and ethical issues. Offered by Computer Science. May not be repeated for credit.

Registration Restrictions:
Required Prerequisite: (ISA 562B and INFS 612B) or CS 555B. B- Requires minimum grade of B-.

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 Volgenau School of Engineering college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

ISA 786: Directed Readings in Information Security. 3 credits.
Research and analysis of contemporary problem in information security. Notes: Prior approval required by faculty sponsor who supervises student's work. To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair. Written report also required. Offered by Computer Science. May be repeated within the degree for a maximum 6 credits.

Recommended Prerequisite: Graduate standing in information security and assurance, with at least 12 prior credits in MS.

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 Volgenau School of Engineering college.

Schedule Type: Research

Grading:
This course is graded on the Graduate Special scale.

ISA 787: Advanced Topics in Information Security. 3 credits.
Special advanced topics not occurring in regular ISA sequence. Notes: May be repeated for credit when distinct offerings of course differ in subject. Offered by Computer Science. May be repeated within the term for a maximum 9 credits.

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 Volgenau School of Engineering college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

Additional Course Details: Title varies by section and/or semester

ISA 798: Research Project. 3 credits.
Research project chosen under guidance of full-time graduate faculty member, resulting in written technical report. Notes: Prior approval required by faculty sponsor who supervises student's work. To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair. Offered by Computer Science. May be repeated within the degree for a maximum 9 credits.

Recommended Prerequisite: 18 credits applicable toward MS.

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 Volgenau School of Engineering college.

Schedule Type: Thesis

Grading:
This course is graded on the Graduate Special scale.

ISA 799: Thesis. 1-6 credits.
Original or expository work chosen and completed under supervision of graduate faculty member, which results in technical report accepted by three-member faculty committee. Report must be defended in oral presentation. Notes: To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair. Offered by Computer Science. May be repeated within the degree.

Recommended Prerequisite: 18 credits applicable toward MS or permission of instructor.

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 Volgenau School of Engineering college.

Schedule Type: Thesis

Grading:
This course is graded on the Satisfactory/No Credit scale.

800 Level Courses

ISA 862: Models for Computer Security. 3 credits.
This class will be focused on current research in Security with emphasis in Network and Software Security. Notes: May be repeated with change in topic. Offered by Computer Science. May be repeated within the degree for a maximum 6 credits.

Registration Restrictions:
Required Prerequisite: ISA 562B.
B- Requires minimum grade of B-.

Enrollment is limited to Graduate level students.

Enrollment limited to students in the Volgenau School of Engineering college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

ISA 863: Advanced Topics in Computer Security. 3 credits.
Current topics of advanced research. Content varies depending on faculty interests, research developments, and student demand. Requires substantial student participation. May include formal models for computer security, multilevel data models, multilevel database management system architectures, secure concurrency control protocols, distributed secure system architectures, integrity models and mechanisms, security policy, and requirements analysis. Offered by Computer Science. May be repeated within the degree for a maximum 6 credits.

Registration Restrictions:
Required Prerequisite: ISA 562B.
B- Requires minimum grade of B-.

Enrollment is limited to Graduate level students.

Enrollment limited to students in the Volgenau School of Engineering college.

Schedule Type: Lecture

Grading:
This course is graded on the Graduate Regular scale.

Additional Course Details: Title varies by section and/or semester