COMPUTER AND INFORMATION SYSTEMS SECURITY, MASTER OF SCIENCE (M.S.) [SCHOOL OF BUSINESS]

Program mission
The Master of Science in Computer and Information Systems Security provides for the scholarly and professional needs of several groups who have either accepted or are keen to take on the challenge of protecting information resources of firms and society at large.

Program goal
Graduates of this program are expected to take on leadership positions, including as chief security officer, in computer and information systems security in organizations. VCU’s program takes a broad interdisciplinary approach to computer and information systems security that will help develop the student’s ability to see the larger organizational, social, political, ethical and economic aspects of information security.

Student learning outcomes
Graduates of the program will be:

1. Prepared to take leading roles in planning, organizing, managing, designing and configuring security solutions in public and private organizations
2. Familiar with state-of-the-art security technologies and best practices

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs
The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Degree candidacy requirements
A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master’s or doctoral status according to the degree candidacy requirements of the student’s graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student’s faculty regarding the student’s academic achievements and the student’s readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (http://bulletin.vcu.edu/academic-reg/grad/candidacy)

Graduation requirements
As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (http://bulletin.vcu.edu/academic-reg/grad/graduation-info)

Apply online at graduate.admissions.vcu.edu (http://www.grduate.admissions.vcu.edu).

Admission requirements
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<th>Degree:</th>
<th>Semester(s) of entry:</th>
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<td>M.S.</td>
<td>Fall</td>
<td>Jul 1</td>
<td>GRE or GMAT</td>
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<td>TOEFL for international students</td>
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Applicants must meet all general admission requirements of the VCU Graduate School (http://bulletin.vcu.edu/graduate/study/admission-graduate-study/admission-requirements).

The Master of Science in Computer and Information Systems Security, jointly offered by the Department of Computer Science in the School of Engineering and the Department of Information Systems in the School of Business, is designed primarily for students interested in professional roles in business, industry or government. Program graduates will serve as leaders within the computer and information systems security community and as strategic partners within the enterprises in which they work. They will stay attuned to, and anticipate changes in, the computer and information systems security environment and ensure that security solutions create a sound, competitive, cost-effective advantage for the enterprise.

Graduates of the program will be prepared to take leading roles in planning, organizing, managing, designing and configuring security solutions in public and private organizations and will be familiar with state-of-the-art security technologies and best practices. The program takes a broad interdisciplinary approach to computer and information systems security that will help students develop the ability to see the larger organization and social, political, ethical and economic aspects of information security, as well as offering a unique graduate-level curriculum that is both technically and managerially oriented.
Degree requirements
In addition to general VCU Graduate School graduation requirements (http://bulletin.vcu.edu/academic-regs/grad/graduation-info), the M.S. in Computer and Information Systems Security requires 30 graduate credit hours, including a core curricular component and an elective component. The elective component consists of three courses chosen by the student and selected from CISS course offerings or, with the approval of the program co-directors, from courses offered by the departments of Computer Science, Information Systems, Criminal Justice and Forensic Science.

Curriculum requirements
Students with an accredited bachelor's degree or post-baccalaureate certificate in fields such as computer science or information systems should be adequately prepared for the graduate curriculum. Students from other academic backgrounds may need to complete undergraduate prerequisite courses. Prerequisites are determined by the faculty adviser at the time of admission.

Prerequisite courses
CMSC 312 or INFO 361 Introduction to Operating Systems 3
CMSC 355 or INFO 370 Software Engineering: Specification and Design, Fundamentals of Data Communications 3
CMSC 401 Algorithm Analysis with Advanced Data Structures 3
CMSC 508 or INFO 364 Database Theory, Database Systems 3
MATH 211 or CMSC 302 Mathematical Structures, Introduction to Discrete Structures 3
STAT 212 Concepts of Statistics 3

Curriculum
Core component
CISS/CMSC 618 Database and Application Security 3
CISS/CMSC 622 Network and Operating Systems Security 3
CISS 624/CMSC 620 Applied Cryptography 3
CISS 634 Ethical, Social and Legal Issues in Computer and Information Systems Security 3
CISS/INFO 644 Principles of Computer and Information Systems Security 3
INFO 646 Security Policy Formulation and Implementation 3

Elective component
Choose four of the following courses. Students must select a minimum of one CMSC and one INFO course 12
CMSC 502 Parallel Algorithms
CMSC 506 Computer Networks and Communications
CMSC 525 Introduction to Software Analysis, Testing and Verification
CMSC 612 Game Theory and Security
CMSC 691 Special Topics in Computer Science

INFO 609 Data-centric Re-engineering Analysis/Planning
INFO 611 Data Re-engineering
INFO 614 Data Mining
INFO 616 Data Warehousing
INFO 632 Business Process Engineering
INFO 641 Strategic Information Systems Planning
INFO 642 Decision Support and Intelligent Systems
INFO 691 Topics in Information Systems

Total Hours 30

Total graduate credit hours required (minimum) 30
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Program websites: computer-science.egr.vcu.edu/graduate/computer-and-information-systems-security (http://computer-science.egr.vcu.edu/graduate/computer-and-information-systems-security) and business.vcu.edu/graduate-studies/ms-in-computer-and-information-systems-security (http://business.vcu.edu/graduate-studies/ms-in-computer-and-information-systems-security)