

# Cybersecurity, MS Interdisciplinary - Computer Science Track

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## Purpose

The MS degree is a unique program in that it is an interdisciplinary program of study among three colleges, Business, Engineering, and Science. Due to this collaboration between the colleges, students will be exposed to a diversified core curriculum with a choice of 3 different elective tracks; having in-depth curriculum in their track while gaining familiarity in the other two. Upon graduation students will be able to perform: Cybersecurity Analysis of vulnerabilities and threats to network environments, Network Penetration Testing, Auditing for Certification & Accreditation, and Technical Project Management in Information Technology. Students will also be able to integrate the business and scientific underpinnings of information technology trends related to the System Development Life Cycle and understand the federal, state & local statutory requirements associated with Information and cybersecurity through the Information Assurance Technical Framework (IATF).

Program prerequisites are kept to a minimum and the program is designed to meet the needs of students with a wide variety of educational backgrounds. The admission and program requirements for those pursuing the Management track are described below.

## Admission Requirements

Individuals who are interested in obtaining application forms and information concerning admission procedures should contact the College's Director of Graduate Programs, Room 102, Business Administration Building. The telephone number is 256.824.6681. The email address is gradbiz@uah.edu. The College's home page can be accessed at <http://uah.edu/cba>.

Admission is granted to students who show high promise for success in graduate study and who hold baccalaureate degrees from approved institutions. Individuals with baccalaureate degrees in any field of study are eligible to apply. Students may have backgrounds in such diverse fields as engineering, science, business, liberal arts, education, and healthcare. Admission to the computer engineering or computer science tracks may require that a student hold a degree in one of the following disciplines:

- Management Information Systems
- Computer Science
- Electrical Engineering, Computer Engineering
- Information Systems Security Engineering

Admission to the program is competitive. It is based on an applicant's undergraduate academic performance and scores on the Graduate Management Admission Test (GMAT) or the Graduate Records Examination (GRE). Scores on the Test of English as a Foreign Language (TOEFL) are required for the applicant whose native language is not English.

The GMAT measures general verbal, mathematical and analytical writing skills that are developed over a long period of time and are associated with success in the first year of study at graduate schools of management. The GMAT does not presuppose any specific knowledge of business areas. The GMAT is a Computer Adaptive Test (CAT) given throughout North America and at many international sites. The test is administered through individually scheduled appointments. Applicants may arrange to take the GMAT by applying on the web at <http://www.mba.com>.

The information on the GRE can be found at <http://www.ets.org>.

In order for applicants to receive full consideration from the admissions committee, all applications materials (graduate application, official copies of all transcripts, and official GMAT or GRE score report) should be received in a timely manner. Use the following dates as a guideline: The deadline for international students is earlier.

| For admission in | Preferred date for all materials | The latest date for all materials |
|------------------|----------------------------------|-----------------------------------|
| Fall semester    | June 1                           | July 15                           |
| Spring Semester  | October 1                        | November 30                       |
| Summer term      | March 1                          | April 30                          |

There is no guarantee that materials received after the latest guideline dates will be processed in time for enrollment in the next semester. Incomplete applications that cannot be processed will be considered for the following semester. Applicants should allow about three weeks from the date the GMAT is administered for official scores to reach Graduate Admissions. Adequate lead time should also be allowed for the receipt of official transcripts from other universities.

## International Students

International applicants who are not native speakers of English are required to submit TOEFL scores or IELTS scores. Students who have received a score of: TOEFL (iBT): all sub-scores equal or greater than 18 OR IELTS score of: all sub-scores equal or greater than 6.0 are eligible for full admission

with no language testing and/or Intensive Language/Culture coursework required. Any English language deficiencies must be remedied through required English as a Second Language (ESL) courses which must be taken beginning in the first semester. For exceptions to this requirement, see the section on Graduate Admissions Information.

International students must submit all application materials to the graduate admissions office by the following deadlines:

|                 | <b>Students currently outside of the United States</b> | <b>Students currently inside the United States</b> |
|-----------------|--------------------------------------------------------|----------------------------------------------------|
| Fall semester   | April 1                                                | June 1                                             |
| Spring semester | September 1                                            | October 15                                         |
| Summer term     | February 1                                             | March 15                                           |

## Tracks

The program is offered in three different disciplines (tracks). Additional requirements for each track are as follows:

### Business

Bachelor's degree in a business or related field; students with a bachelor's in an unrelated field will be required to take the following prerequisites - Computer Applications, Computer Programming, and Computer Science and Networks.

### Computer Science

Bachelor's degree in computer science or a related field; student's with a bachelor's in an unrelated field will be required to take the following prerequisites: Data Structure, Operating Systems, Algorithm Design and Analysis, Computer Architecture and Probability and Statistics.

### Engineering

Bachelor's degree in engineering from an ABET accredited program; students with a bachelor's in an unrelated field will be required to take the following prerequisites: Data Structure, Operating Systems, Algorithm Design and Analysis, Computer Architecture, Probability and Statistics.

MSCBS is a 33 semester hour graduate level credit program. 18 semester hours of the credits are part of the core classes while the other 15 are focused on the specific track.

The MS-CBS program consists of 30 semester hours of graduate coursework. The coursework includes a five-course core that is required of all students, 9 credit hours of management track required courses, and 6 credit hours of electives. The directed elective choices are designed to provide students a broader understanding of multiple cybersecurity functions normally expected in an organization.

CS 692/IS 692 is the capstone course and should be taken toward the end of the student's program. The grade in CS 692/IS 692 can be no lower than B.

| <b>Code</b>                                  | <b>Title</b>                                      | <b>Semester Hours</b> |
|----------------------------------------------|---------------------------------------------------|-----------------------|
| <b>Cybersecurity Core Courses</b>            |                                                   |                       |
| IS 660                                       | CYBERSECURITY MANAGEMENT                          | 3                     |
| IS 663                                       | COMPUTER FORENSICS                                | 3                     |
| CPE 549                                      | INTRO TO CYBERSECURITY ENGINRG                    | 3                     |
| CS 585                                       | INTRO TO COMPUTER SECURITY                        | 3                     |
| CS 692<br>or IS 692                          | CYBERSECURITY CAPSTONE<br>CYBERSECURITY PRACTICUM | 3                     |
| <b>Cybersecurity: Computer Science Track</b> |                                                   |                       |
| CS 565                                       | NETWORK SECURITY                                  |                       |
| CS 570                                       | INTRO TO COMPUTER NETWORKS                        |                       |
| CS 685                                       | COMPUTER SECURITY                                 |                       |
| <b>Electives</b>                             |                                                   |                       |
| Select two of the following:                 |                                                   | 6                     |
| IS 571                                       | BUSINESS INTELLIGENCE & ANALYT                    |                       |
| IS 640                                       | DATA MGT AND DATA MINING                          |                       |
| IS 691                                       | INFORMATION SYS STRATEGY & APP                    |                       |
| CPE 534                                      | OPERATING SYSTEMS                                 |                       |
| CPE 647                                      | UBIQUITOUS COMPUTING                              |                       |

|         |                                |
|---------|--------------------------------|
| CPE 648 | ADVANCED COMPUTER NETWORKS     |
| CS 687  | DATA BASE SYSTEMS              |
| CS 553  | CLIENT/SERVER ARCHITECTURES    |
| CS 617  | DES & ANALY OF ALGORITHM       |
| CS 650  | SOFT'W ENGINEERING PROC        |
| CS 670  | COMPUTER NETWORKS              |
| CS 690  | ADVANCED OPERATING SYSTEMS     |
| IS 560  | TELECOMMUNICATIONS & NETWRK'G  |
| IS 577  | NETWORK DEFENSE & OPERATING SY |
| IS 670  | BUSINESS CONTINGENCY PLANNING  |
| CPE 649 | ADV CYBERSECURITY ENGINEERING  |
| CPE 645 | COMPUTER NETWORK SECURITY      |
| CPE 646 | MOBILE & WIRELESS NETWORKS     |
| CS 565  | NETWORK SECURITY               |
| CS 570  | INTRO TO COMPUTER NETWORKS     |
| CS 685  | COMPUTER SECURITY              |

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Total Semester Hours

21

### Restrictions on Elective Courses

1. Computer Science track students should take two elective courses from CS courses.
  2. Computer Engineering track students should take at least one elective course from CPE courses.
1. Students can take only one course between these courses.
    - a. CS 570 and IS 560
    - b. CS 685 and CPE 645
    - c. CS 670 and CPE 646
    - d. CS 687 and IS 640
  2. At least half of the hours must be completed in courses numbered 600.