

# APPLIED INFORMATION TECHNOLOGY, MS

**Banner Code:** VS-MS-AIT

## Academic Advising

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The MS in Applied Information Technology is the very best graduate education in IT for high-potential leaders, especially those working on IT solutions that affect the federal government, industry or non-profit. Its objective is to graduate individuals of competence and character who can lead multidisciplinary teams in the design, justification, development, management, and sustainment of mega-systems from data to decision in the private and federal sectors. The MS in AIT provides a high quality curricula for students seeking to pursue their careers in the leading IT areas including Cyber Security, Big Data Analytics, Knowledge Mining, Data Analytics in Social Media, and Cyber-Human Interaction. Faculty include professors from the Volgenau School, the School of Business, and the College of Humanities and Social Sciences, plus industry leaders with unique reputations in the subject area as adjunct professors and guest lecturers. The faculty expose students to the pragmatic issues of IT, not just the theory.

## Admissions & Policies

### Admissions

Applicants must have completed a baccalaureate degree from an accredited program with a reputation for high academic standards and an earned GPA of 3.00 or better in their 60 highest-level credits. They must be experienced in the fundamentals of IT and quantitative methods. In addition, applicants must:

- Provide two letters of recommendation, preferably from academic references or references in industry or government who are familiar with the applicant's professional accomplishments.
- Provide a resume and detailed statement of career goals and professional aspirations.
- If their native language is not English, students must earn a minimum TOEFL score of 570 for the paper-based exam or 88 points total with a minimum of 20 points in each section for the internet-based exam (a minimum score of 600 for the paper-based exam or 100 for the Internet-based exam is required for applicants who wish to be considered for a graduate teaching assistantship).

## Requirements

### Degree Requirements

Total credits: 30-36 credits

Completion of the MS program requires a minimum of 30 approved graduate credits (10 courses). To provide a common background in the fundamentals of information sciences and technology, all students are required to complete four core courses. In addition to the core courses,

students must choose a concentration within the program by taking six courses from one of the concentration areas listed below.

Students in all concentrations may take other VSE graduate-level courses not listed below as part of their MS technical electives subject to advisor approval.

### Core Courses

Code	Title	Credits
<b>Required Core Courses</b>		
12		
For students in all concentrations except the IT Management in Federal Sector concentration		
AIT 512	Algorithms and Data Structures Essentials	
AIT 524	Database Management Systems	
AIT 542	Fundamentals of Computing Platforms	
AIT 664	Information: Representation, Processing and Visualization	
For students in the IT Management in Federal Sector concentration		
AIT 524	Database Management Systems	
AIT 542	Fundamentals of Computing Platforms	
AIT 580	Analytics: Big Data to Information	
AIT 664	Information: Representation, Processing and Visualization	
Total Credits		12

### Concentrations

#### Available Concentrations

- Cyber Security (CYBR)
- Cyber-Human Systems (CBHS)
- Data Analytics and Intelligence Methods (DAIN)
- IT Management in Federal Sector (IMFS)

#### Cyber Security (CYBR)

Complete four required courses and two electives from the following list of courses.

Code	Title	Credits
<b>Foundation</b>		
AIT 660	Cyber Security Fundamentals	3
AIT 681	Secure Software Development	3
AIT 682	Network and Systems Security	3
AIT 702	Incident Handling and Penetration Testing	3
<b>Electives</b>		
6		
AIT 670	Cloud Computing Security	
AIT 672	Identity and Access Management	
AIT 699	Research Project	
AIT 701	Cyber Security: Emerging Threats and Countermeasures	
AIT 799	Master's Thesis	
Total Credits		18

**Cyber-Human Systems (CBHS)**

Complete four required courses and two electives from the following list of courses.

Code	Title	Credits
<b>Foundation</b>		
AIT 582	Applications of Metadata in Complex Big Data Problems	3
AIT 602	Introduction to Research in Applied Information Technology	3
AIT 716	Human Computer Interaction	3
AIT 724	Data Analytics in Social Media	3
<b>Electives</b> 6		
AIT 614	Big Data Essentials	
AIT 624	Knowledge Mining from Big-Data	
AIT 699	Research Project	
AIT 711	Rapid Development of Scalable Applications	
AIT 734	Advanced Web Analytics Using Semantics	
AIT 799	Master's Thesis	
Total Credits		18

**Data Analytics and Intelligence Methods (DAIN)**

Complete four required courses and two electives from the following list of courses.

Code	Title	Credits
<b>Foundation</b>		
AIT 614	Big Data Essentials	3
AIT 624	Knowledge Mining from Big-Data	3
AIT 677	Intelligence Analysis Methods	3
AIT 724	Data Analytics in Social Media	3
<b>Electives</b> 6		
AIT 582	Applications of Metadata in Complex Big Data Problems	
AIT 699	Research Project	
AIT 711	Rapid Development of Scalable Applications	
AIT 716	Human Computer Interaction	
AIT 734	Advanced Web Analytics Using Semantics	
AIT 799	Master's Thesis	
CFRS 500	Introduction to Forensic Technology and Analysis	
CFRS 660	Network Forensics	
Total Credits		18

**IT Management in Federal Sector (IMFS)**

Code	Title	Credits
Select six courses from the following: <sup>1</sup> 18		
AIT 582	Applications of Metadata in Complex Big Data Problems	
AIT 614	Big Data Essentials	
AIT 622	Determining Needs for Complex Big Data Systems	

AIT 660	Cyber Security Fundamentals
AIT 665	Managing Information Technology Programs in the Federal Sector
AIT 670	Cloud Computing Security
AIT 672	Identity and Access Management
AIT 677	Intelligence Analysis Methods
AIT 678	National Security Challenges
AIT 679	Law and Ethics of Big Data
AIT 685	Capstone Seminar
AIT 697	Leading Organizations Through Change
AIT 701	Cyber Security: Emerging Threats and Countermeasures

Total Credits 18

<sup>1</sup> Students in this concentration may also take other IST graduate-level courses not listed below as part of their MS technical electives, subject to approval of the advisor.

**Accelerated Master's****Individualized Study, BIS/Applied Information Technology, Accelerated MS Overview**

Highly-qualified students in the Individualized Study, BIS have the option of obtaining an accelerated Applied Information Technology, MS.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees. For policies governing all graduate degrees, see AP.6 Graduate Policies.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in Graduate Admissions. Mason undergraduate students in the BIS Program can apply in the semester in which they will have completed 90 or more credits (including 15 Mason resident credits) applicable toward the BIS. Students must have an overall GPA of at least 3.30 to apply to the program.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition Form (<http://registrar.gmu.edu/forms>).

**Accelerated Option Requirements**

Students in the accelerated master's option must maintain a minimum 3.30 GPA in the undergraduate segment until they have satisfied all requirements for the BIS degree. On completion and conferral of the undergraduate degree they submit the Bachelor's/Accelerated Master's

Transition Form (<http://registrar.gmu.edu/forms>) and are admitted to graduate status.

As graduate students, accelerated master's students have an advanced standing. Students must complete all credits that satisfy requirements of the BIS program and those of the MSAIT program, with two courses overlapping from the courses necessary to earn the BIS with a concentration IND (individualized), applied information technology emphasis as listed below.

Code	Title	Credits
AIT 524	Database Management Systems	3
AIT 542	Fundamentals of Computing Platforms	3
Total Credits		6

## Information Technology, BS/Applied Information Technology, Accelerated MS

### Overview

Highly-qualified students in the Information Technology, BS have the option of obtaining an accelerated Applied Information Technology, MS.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees. For policies governing all graduate degrees, see AP.6 Graduate Policies.

### Admission Requirements

Students in the Information Technology, BS program may apply to this option if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. Criteria for admission are identical to criteria for admission to the Applied Information Technology, MS program.

### Accelerated Option Requirements

Students must complete all credits that satisfy requirements for the BS and MS programs, with 6 credits overlap.

Students register for 6 credits of AIT 500-level core courses in place of the corresponding IT 300-level courses required for the undergraduate degree requirements.

Students must register for two of the following courses in place of the corresponding 300-level courses:

Code	Title	Credits
AIT 512	Algorithms and Data Structures Essentials (satisfies the IT 306 requirement in the BS program)	3
AIT 524	Database Management Systems (satisfies the IT 314 requirement in the BS program)	3
AIT 542	Fundamentals of Computing Platforms (satisfies the IT 342 requirement in the BS program)	3

Students may take additional graduate-level courses as part of their BS technical electives with advisor approval. These additional graduate-level courses will not count toward the MS degree. See AP.1.4.4 Graduate Course Enrollment by Undergraduates.

### Degree Conferral

Students must apply the semester before they expect to complete the BS requirements to have the BS degree conferred. In addition, at the beginning of the student's final undergraduate semester, students must complete a Bachelor's/Accelerated Master's Transition form that is submitted to the Office of the University Registrar and the VSE Graduate Admissions Office. At the completion of MS requirements, a master's degree is conferred.