Volgenau School of Engineering

INFORMATION TECHNOLOGY, B.S.

2019 - 2020

The BS in Information Technology program aims to meet the existing and emerging needs of industry by educating new IT workers in current IT principles and practices, and in its applications. The program focuses on equipping graduates with effective skills for interacting at the management level as well as the technical level. Graduates fill jobs that focus on the application of IT in an increasing number of emerging sub-disciplines, including network administration, information security, information systems, telecommunications, web development, computer graphics, and data management. The BS in Information Technology program is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org.

Admission Requirements
Students who meet Mason’s general eligibility requirements may apply for admission to the Information Technology major. Admission is based on the appropriateness of student’s academic objectives and the likelihood of the student benefiting from the program. Preference in admission is given to students who have four years of high school mathematics, including pre-calculus.

Degree Requirements
The IT program can be successfully completed in 8 full-time semesters with an average of 15 credits each semester, as shown in the sample schedule. It is also possible for students to complete the degree on a part-time basis. The 120-credit degree requirement consists of Mason Core requirements, IT foundation and core courses, and courses required for the chosen IT concentration area. Students must complete requirements for at least one of five IT concentration areas. Lower division program courses are primarily taught at the Fairfax campus, while upper division program courses are primarily taught at the Science and Technology campus, where many Department of Information Sciences and Technology faculty offices are located. Distance education sections are available for the majority of program courses.

At least 45 semester hours of the degree requirements must be level 300 or above, and at least 30 semester hours toward the BS degree must be earned at George Mason University. Students must have a C or better in any course that satisfies a prerequisite for an IT course. To graduate with the BS in Information Technology, students must have a GPA of 2.75 or better across the IT foundation, core, capstone, and concentration courses. Additionally, students must have a C or better in their foundation, core, capstone, and concentration courses.

IT Foundation, Core, Concentration, and Capstone Requirements
In addition to Mason Core requirements, including humanities and social sciences as well as mathematics and basic sciences, the BS in Information Technology requires IT foundation, core, and concentration courses as described below. The IT major also requires a 7-credit capstone design project, to be completed over a period of two consecutive semesters.

1. Foundation Courses
   IT 102   Discrete Structures or MATH 125   Discrete Mathematics I
   IT 104   Introduction to Computing
   IT 105   IT Architecture Fundamentals
   IT 106   Introduction to IT Problem Solving Using Computer Programming or IT 109   Introduction to Computer Programming
   IT 206   Object Oriented Techniques for IT Problem Solving or IT 209   Intro to Object Oriented Programming
   IT 216   Systems Analysis and Design
   STAT 250   Introductory Statistics I

2. Core Courses
   IT 207   Applied IT Programming
   IT 213   Multimedia and Web Design
   IT 214   Database Fundamentals
   IT 223   Information Security Fundamentals
   IT 300   Modern Telecommunications
   IT 304   IT in the Global Economy
   IT 341   Data Communications and Network Principles
   IT 342   Operating Systems Fundamentals
   IT 343   IT Project Management
   MBUS 300   Accounting in a Global Economy
   SYST 465   Human Computer Interaction

3. Two-Semester Capstone Sequence
   IT 492   Senior Design Project I
   IT 493   Senior Design Project II

4. Other Requirements
   IT 293   Applied IT: Junior Transition
   COMM 100   Public Speaking or COMM 101   Fundamentals of Communication
   Natural Science with Lab
   Natural Science without Lab
   MATH 108   Introductory Calculus with Business Applications or MATH 113   Analytic Geometry and Calculus

Advanced Study: Mason offers students the ability to complete both BS and MS degrees in a shorter time through an Accelerated Masters (MS) program. Choosing to pursue an accelerated MS may affect a student's choice of courses in the BS program. Students should consult with an advisor for assistance. See http://ist.gmu.edu/go/advising for more information.

This document provides general information about the BS in Information Technology program for information purposes only. The definitive statement of policy and requirements is the University Catalog (http://catalog.gmu.edu). In the event of any differences between this sheet and the Catalog, the latter prevails.
5. Concentration Area

Students choose one of five concentrations from the list below. To be eligible to declare a concentration, a student must earn a B or better in the associated concentration's gateway course(s). To fulfill the requirements for a concentration, students need 15 credits made up of four courses from their chosen concentration and a fifth course chosen from any of the five concentrations. All concentration courses require a grade of B or better in the prerequisite gateway course(s) associated with that concentration.

### Database Technology and Programming (DTP)

- Gateway: IT 206 or IT 209: OOTech/IT Problem Solving and IT 214 or IT 194: Databases Fundamentals

**REQUIRED:** IT 306: Program Design and Data Structures or IT 309: Data Structures and Algorithms in Python AND IT 314: Database Programming
- IT 315: Mobile Development
- IT 322: Health Data Challenges
- IT 369: Data and Application Security
- IT 390: Rapid Dev of Scalable Applications
- IT 409: Python Web Programming
- IT 410: Web Programming
- IT 411: Database Administration
- IT 415: Intro to Applied Natural Language Processing
- IT 495: Turning Ideas into Successful Companies

### Health Information Technology (HIT)

- Gateway: IT 214 or IT 194: Databases Fundamentals

**HAP 360:** Intro to Health Information Systems
- IT 322: Health Data Challenges
- IT 324: Health Information Technology Fundamentals
- IT 390: Rapid Dev of Scalable Cloud Applications
- STAT 362: Intro to Computer Statistical Packages

### Network and Telecommunications (NTEL)

- Gateway: IT 341: Data Comm/Network Pmcs

**ECE 301:** Digital Electronics
- IT 366: Network Security
- IT 441: Network Servers and Infrastructures
- IT 445: Advanced Networking Principles
- IT 455: Wireless Communications and Networking
- IT 465: Peer-to-Peer Systems/Overlay Networks
- IT 484: Voice Communications Technologies
- IT 488: Fundamentals of Satellite Communications

### Cyber Security (CYBR)

- Gateway: IT 223: Info Security Fundamentals

**IT 352:** Security Administration of Linux Systems
- IT 353: Information Defense Technologies
- IT 357: CRIM 304: Computer Crime, Forensics, and Auditing
- IT 366: Network Security
- IT 369: Data and Application Security
- IT 429: Security Accreditation of Info Systems
- IT 462: Applied Cyber Threat Analysis
- IT 466: Foundations of Cryptography and Security
- IT 467: Network Defense

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**2019-2020 Sample Schedule for Undergraduate Information Technology majors**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
<th>Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td></td>
<td><strong>Second Semester</strong></td>
<td></td>
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<tr>
<td>MATH 108 Introductory Calculus with Business Applications or MATH 113 Analytic Geometry and Calc I</td>
<td>3</td>
<td>IT 102 Discrete Structures or MATH 125 Discrete Mathematics I</td>
<td>3</td>
</tr>
<tr>
<td>IT 104 Introduction to Computing</td>
<td>3</td>
<td>IT 106 Intro to IT Problem Solv Using Comp Prgr or IT 109 Intro to Comp Prog</td>
<td>3</td>
</tr>
<tr>
<td>IT 105 IT Architecture Fundamentals</td>
<td>3</td>
<td>Mason Core*</td>
<td>3</td>
</tr>
<tr>
<td>Mason Core*</td>
<td>3</td>
<td>Mason Core*</td>
<td>3</td>
</tr>
<tr>
<td>Total Hours</td>
<td>15</td>
<td>Total Hours</td>
<td>15</td>
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</tbody>
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| **Third Semester** |        | **Fourth Semester** |       |
| IT 206 or IT 209 Intro Object Oriented Programming | 3 | STAT 250 Introductory Statistics I | 3 |
| IT 213 Multimedia and Web Design | 3 | IT 216 Systems Analysis and Design | 3 |
| IT 214 Database Fundamentals | 3 | IT 223 Information Security Fundamentals | 3 |
| Mason Core Natural Science with lab* | 4 | IT 293 Applied IT: Junior Transition | 1 |
| Mason Core* | 3 | Mason Core* | 3 |
| Total Hours | 16 | Total Hours | 16 |

| **Fifth Semester** |        | **Sixth Semester** |       |
| IT 207 Applied IT Programming | 3 | IT 342 Operating System Fundamentals | 3 |
| IT 300 Modern Telecommunications | 3 | IT 343 IT Project Management | 3 |
| IT 304 IT in the Global Economy | 3 | IT Concentration Course | 3 |
| IT 341 Data Communications and Network | 3 | MBUS 300 Accounting in a Global Economy | 3 |
| SYST 469 Human Computer Interaction | 3 | Elective | 3 |
| Total Hours | 15 | Total Hours | 15 |

| **Seventh Semester** |        | **Eighth Semester** |       |
| IT 492 Senior Design Project I | 3 | IT 493 Senior Design Project II | 4 |
| IT Concentration Course | 3 | IT Concentration Course | 3 |
| IT Concentration Course | 3 | IT Concentration Course | 3 |
| ENGH 302 Adv Comp (Business, Nat Sci, or Multi Disc)** | 3 | Elective | 3 |
| Elective | 3 | Elective | 3 |
| Total Hours | 15 | Total Hours | 13 |

*http://catalog.gmu.edu/mason-core* Mason Core Categories: One course from each: Oral Communication, ENGH 100 or 101, Arts, Global Understanding, Literature, Western Civilization/World History, Natural Science w/ Lab, Natural Science Non-Lab. *** ENGH 100 or 101 and Mason Core-Literature must be completed before taking ENGH 302.

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**Program Questions? Email:** bsit@gmu.edu; **Website:** http://ist.gmu.edu; **Advising Appointments:** http://ist.gmu.edu/go/advising

**Fairfax Campus:** Nguyen Engineering Building, Rm. 5400, 4400 University Dr., Fairfax, VA 22030, MSN 1G8, Phone (703) 993-3565; Fax (703) 993-2972

**Science and Technology Campus:** Bull Run Hall, Rm. 102, 10900 University Blvd., Manassas, VA 20110, MSN 4F5, Phone (703) 993-8461; Fax (703) 993-8450