

MSIT  
Program  
Handbook

2020-2021

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## Master of Science in Information Technology

- Information Technology Management
- Information Security and Assurance
- Business Intelligence and Data Analytics
- Software Design and Management
- Customized Partner Programs:
  - *General Motors*
  - *Dual Degree with Tec de Monterrey*

Ramayya Krishnan, Dean  
Andrew Wasser, Associate Dean  
Michael D. Smith, Faculty Chair  
Allison Frankoski, Program Director

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# MSIT PROGRAM HANDBOOK

## 1 COLLEGE AND PROGRAM HANDBOOKS

It is the student's responsibility to know, understand and abide by the policies contained in both the Heinz College-wide Student Handbook and the MSIT Program Handbook. The Student Handbook details College-wide policies and procedures pertaining to educational planning, program committee, teaching, scheduling and course credit, performance standards, academic standing, ethics and discipline, student privacy rights, and major forms and deadlines. The Program Handbook provides specific information on the curriculum and program requirements for the **Master of Science in Information Technology (MSIT)** degrees. Therefore, students must familiarize themselves with **both** handbooks, which are available at the Heinz College website at <https://www.heinz.cmu.edu/current-students/> and upon request from the MSIT Program Director: Mrs. Allison Frankoski, 412-268-8983, [allison@cmu.edu](mailto:allison@cmu.edu), Hamburg Hall 1104D.

## 2 MSIT PROGRAM OVERVIEW

The MSIT program is designed for the experienced technology professional to complete one of four master's degrees on a part-time basis alongside their full-time job. It offers fully online or hybrid of on-campus evening and online course modalities and the flexibility for students to choose a course load each semester that best suits their work/personal situation. Most part-time MSIT students take 1-2 courses each semester and are able to complete the program in 2-3 years. However, students have up to five years to finish the program and may extend up to seven years when due to extenuating circumstances or extended leaves of absence.

The MSIT program offers four majors of study:

- MSIT-Information Technology Management – evening (MSIT-ITM) or online (MSIT-IMD)
- MSIT-Information Security & Assurance – evening (MSIT-ITA) or online (MSIT-DIA)
- MSIT-Business Intelligence & Data Analytics – evening (MSIT-BI) or online (MSIT-DBI)
- MSIT-Software Design & Management – evening only (MSIT-ITD) – ENDS December 2020

Each degree requires completion of 60 units of core courses and 84 units of elective coursework. Of those 84 units of elective, up to 12 units may be an independent study related to the selected major and up to 24 units may be from transfer credit of previously earned graduate credit.

Electives may be from the list of 95-xxx Information Systems Management department courses, the MSIT online course catalog, and graduate-level courses offered by other Heinz College programs or CMU departments, subject to pre-approval from the MSIT Program Director.

This handbook also covers customized degree programs for our partnerships with General Motors and Tec de Monterrey. These custom programs are variations of the above programs of study and their requirements are in section 4.5 of this handbook.

### 3 MSIT PROGRAM-SPECIFIC POLICIES

The Master of Science in Information Technology (MSIT) program abides by the policies of the Heinz College as outlined in the Heinz College-wide Student Handbook. In particular, MSIT students are expected to maintain good academic performance with integrity, as outlined in sections 7. Performance Standards, 8. Academic Standing and 9. Ethics and Discipline. The following are some requirements or modifications from the College-wide handbook that are specific to MSIT students:

#### 3.1 *Graduation Requirements*

A MSIT student must satisfy the following requirements **within five years** from the first semester in which they matriculated in order to graduate from the MSIT program:

- Earned 144 units of course credit (*including approved transfer credit*);
- Successfully passed all core courses (*or earned an exemption from the course*);
- Achieved a minimum cumulative quality point average (QPA) of 3.0.

The statute of limitations is five years for the MSIT degree. This is a more restrictive policy than the 7-year statute posted in the Heinz College-wide Handbook or by [Carnegie Mellon University](#). Most part-time MSIT students can complete their degree in two to three years. After five years, a student may petition to extend this up to seven years if the delay was due to extenuating circumstances and/or extended leave(s) of absence that prevented the student from completing the MSIT degree within five years. Students must contact the Program Director during their fifth year to discuss a plan for completion.

#### 3.2 *Part-time Course Load*

A full-semester course carries 12 units of credit and generally expects 12 hours of time and effort per week on average, including 3 hours of lecture per week. “Mini” courses are half of a semester in length; they generally carry 6 units of credit and also require approximately 12 hours per week. Part-time students should use this as a guide to determine how much coursework they can manage on top of their employment and personal commitments.

MSIT is a **part-time only** program so students may take **up to 30 units per semester**, although most find 12-18 units a more manageable load. Students may petition to exceed 30 units temporarily if the student has extenuating circumstances that warrant a heavier course load and their demonstrated academic performance shows they can handle the extra workload. Students who intend to enroll full-time (36 units or more) on a regular basis should pursue one of the full-time Heinz College programs instead. **International MSIT students cannot exceed 30 units**, regardless of circumstances, due to visa regulations. **MSIT is not eligible for student visa.**

Students may adjust their course load without penalty up until the official Add/Drop deadline for Heinz College classes, which is typically the first two weeks of a semester-long class and just the first week of each mini-semester class. Any schedule changes after that deadline must be due to extenuating circumstances and require filing a [General Petition form](#). Students should

discuss their situation with the Program Director first as there may be other options besides dropping, such as using your Late Drop Voucher or requesting an Incomplete (I) grade.

The incomplete grade option may be appropriate when a student is making good progress in a class but extenuating circumstances will prevent them from completing all requirements for a course by the end of its semester. If the instructor agrees, the student and instructor must [submit a formal contract](#) before the Official Last Day of Class detailing the plan for completion, including a default final grade if the remaining work is not done. The incomplete work must be done no later than the end of the subsequent semester, or sooner if the contract dictates.

Part-time students may take a semester or more off from classes by submitting a **Leave of Absence form** to the Program Director at least one week before the first day of the semester. When a student is ready to return to studies, they must submit the **Petition to Return from Leave** to the Program Director at least one week before the first day of the semester. Students can get these forms from the registrar's website: <https://www.cmu.edu/hub/forms.html>.

### 3.3 *Exemption and Transfer Credit*

**All petitions for exemption and transfer credit must be submitted within your first semester of enrollment.**

**MSIT students may pursue exemptions from core courses** if you have already acquired all or most of the skills taught in that course outside of the College. To receive an exemption, you must petition the instructor of the relevant course or take their qualifying exam. The procedures are in the College handbook. Please note you do not earn credit for an exemption, therefore, you must take additional elective to make up the units that were exempted. An exemption does mean you have satisfied completion of that core course for purposes of graduation, as well as if that course is a prerequisite for another class.

See Section 6.8.4 of the Heinz College Student Handbook for Transfer Credit information and application. In general, the Heinz College full-time programs do not give transfer credit for graduate courses taken prior to admission. However, the **MSIT program will consider up to 24 units of relevant transfer credit** to count towards MSIT electives. Petitions are decided on a case-by-case basis and depend on a number of factors. Minimum criteria include that the credit was earned with a grade of B or better within the last 10 years at a regionally accredited university. That grade will not be calculated into your CMU quality point average but the units will be counted towards MSIT elective requirements and will appear on your CMU transcript.

### 3.4 *Elective Options*

Students may take up to 12 units of **Independent Study** as an elective, except for our sponsored students from General Motors and Tec de Monterrey. Contact the Program Director for guidelines on developing an appropriate independent study.

Students may take up to 12 units of elective coursework as **Pass/No Pass grade**, except for our sponsored students from General Motors and Tec de Monterrey.

Students may take up to 36 units of graduate **coursework from other CMU departments outside of Heinz College**, except for our sponsored students from General Motors and Tec de Monterrey. You **must get approval in advance** from the Program Director before registering for the class by filing a [General Petition](#).

**Courses at other universities** fall under the transfer credit policy for MSIT and must be courses completed prior to admission. Any exceptions to that policy must be due to extenuating circumstances and require a petition to the Program Director **before** taking the non-CMU course, or was already pre-approved as part of a custom curriculum with GM or ITESM.

### 3.5 *Java Programming Prep Course and Other Training Options*

The School of Information Systems and Management courses typically expect students have had an undergraduate level object-oriented programming course or equivalent work experience. This background is required before taking our programming classes, 95-712 or 95-807, which are NOT introductory java programming courses. Anyone lacking that background or wanting a refresher should pursue a prep course outside of the MSIT curriculum, such as:

CMU Open Learning: <https://oli.cmu.edu/courses/introduction-to-programming-in-java-o-f/>  
 Heinz College Admissions: [Pre-Approved Java Programming Courses](#) for MSIT/MISM applicants.  
 CMU students have free access to online training at [Lynda/LinkedIn Learning](#).

## 4 **MSIT CURRICULUM**

### 4.1 *MSIT-Information Technology Management (MSIT-ITM, MSIT-IMD)*

This degree can be done fully online or hybrid with online and on-campus evening classes. It requires one undergraduate level object-oriented programming class or equivalent work experience prior to admission because that is a prerequisite for the core java class (95-712 or 95-807). See Section 3.5 for refresher suggestions.

|           |                                     |          |
|-----------|-------------------------------------|----------|
| 95-703    | Database Management                 | 12 units |
| 95-712*   | Object Oriented Programming in Java | 12 units |
| 95-706    | Object-Oriented Analysis and Design | 6 units  |
| 95-705    | Telecommunications Management       | 12 units |
| 95-734**  | Managing Digital Business           | 12 units |
| 95-808*** | IT Project Management               | 6 units  |
| Various   | Electives                           | 84 units |

\* 95-807 is substituted for 95-712 in the online program; evening students may take either one but 95-712 is recommended if you will take more technical electives offered on campus.

\*\* 95-734 replaced the 95-730 E-business Tech core effective Fall 2019.

\*\*\* 94-813 can be substituted for 95-808.

### 4.2 *MSIT-Information Security and Assurance (MSIT-ITA, MSIT-DIA)*

This degree can be done fully online or hybrid with online and on-campus evening classes.

|        |  |          |
|--------|--|----------|
| 95-752 | Intro to Information Security Management | 12 units |
| 95-705 | Telecommunications Management            | 12 units |
| 94-806 | Privacy in the Digital Age               | 6 units  |

|         |  |          |
|---------|--|----------|
| 95-755  | Information Security Risk Management I | 6 units  |
| 95-744  | Cyber Security Policy and Governance I | 6 units  |
| 95-748  | Software and Security                  | 6 units  |
| 95-758  | Network and Internet Security          | 12 units |
| Various | Electives                              | 84 units |

#### 4.3 *MSIT-Business Intelligence and Data Analytics Track (MSIT-BI, MSIT-DBI)*

This degree can be done fully online or hybrid with online and on-campus evening classes. The core requirements were updated by Heinz College faculty in 2019. Students admitted prior to August 2019 should consult with their Program Director to develop a transition plan.

|           |   |          |
|-----------|---|----------|
| 95-703    | Database Management                               | 12 units |
| 95-710 *  | Economic Analysis                                 | 6 units  |
| 95-796 *  | Statistics for IT Managers                        | 6 units  |
| 94-806    | Privacy in the Digital Age                        | 6 units  |
| 95-797    | Data Warehousing                                  | 6 units  |
| 95-868    | Exploring and Visualizing Data (using R)          | 6 units  |
| 95-791 ** | Data Mining                                       | 6 units  |
| 95-865    | Unstructured Data Analytics (replaces 95-852 ADS) | 6 units  |
| 95-866    | Advanced Business Analytics                       | 6 units  |
| Various   | Electives   | 84 units |

\* 91-803 can be substituted for 95-710 and 91-801 can be substituted for 95-796. Since 91-803 and 91-801 are each worth 12 units, each will use 6 units of core and 6 units of electives.

\*\* It is strongly recommended that students are familiar with R programming before taking Data Mining, either by taking 94-842 R Programming for Analytics, 95-868 Exploring and Visualizing Data, or equivalent work or practical experience.

#### 4.4 *MSIT-Software Design and Management (MSIT-ITD)*

This degree is in conjunction with the School of Computer Science and is limited to local evening students. It will be ending December 2020. There is no fully online option but many courses can be taken online. The programming and software development experience required as a prerequisite to apply means students admitted to this major have essentially earned an exemption from 95-712 or 95-807 and satisfied any course that lists them as a prerequisite.

|         |                                     |          |
|---------|-------------------------------------|----------|
| 95-771  | Data Structures and Algorithms      | 12 units |
| 17-653  | Managing Software Development       | 12 units |
| 17-655  | Architecture of Software Systems    | 12 units |
| 95-703  | Database Management                 | 12 units |
| 95-706  | Object-Oriented Analysis and Design | 6 units  |
| 95-808* | IT Project Management               | 6 units  |

|         |           |          |
|---------|-----------|----------|
| Various | Electives | 84 units |
|---------|-----------|----------|

\* 94-813 can be substituted for 95-808.

#### 4.5 Customized Partner Programs

All Heinz College and MSIT policies may apply unless otherwise modified in the curriculum distribution listed here and/or in the educational partnership agreement/contract.

##### 4.5.1 General Motors Information Systems Management (MSIT-DIM aka MSIT-ISM)

|           |                                       |                     |
|-----------|---------------------------------------|---------------------|
| 95-703    | Database Management                   | 12 units/4 credits  |
| 95-807    | Object Oriented Programming           | 12 units/4 credits  |
| 95-705    | Telecommunications Management         | 12 units/4 credits  |
| 95-734    | Managing Digital Business             | 12 units/4 credits  |
| 95-833    | Global IT Mgmt, Sourcing & Automation | 12 units/4 credits  |
| 95-706    | Object-oriented Analysis & Design     | 6 units/2 credits   |
| 95-722    | Digital Transformation                | 6 units/2 credits   |
| 17-653    | Managing Software Development         | 12 units/4 credits  |
| 17-638*   | Architecture of Software Systems      | 6 units/2 credits   |
| 95-720    | Information Systems Project           | 24 units/8 credits  |
| Various** | Electives (pick 2-3)                  | 30 units/10 credits |

\* 17-655 can be substituted for 17-638 for students with robust java programming skills.  
17-655 is 12 units/4 credits so this will also take away 6 units/2 credits of electives.

\*\* Can include other CMU courses in the GM offerings and pre-approved electives offered by other GM TEP partner universities.

##### 4.5.2 General Motors Software Engineering (MSIT-DIS aka MSIT-SE)

This major is ending and no new students were admitted after Spring 2018:

|           |                                  |                    |
|-----------|----------------------------------|--------------------|
| 17-651    | Models of Software Systems       | 12 units/4 credits |
| 17-652    | Methods: Deciding What to Design | 12 units/4 credits |
| 17-653    | Managing Software Development    | 12 units/4 credits |
| 17-654    | Analysis of Software Artifacts   | 12 units/4 credits |
| 17-655    | Architecture of Software Systems | 12 units/4 credits |
| 95-703    | Database Management              | 12 units/4 credits |
| 95-705    | Telecommunications Management    | 12 units/4 credits |
| 95-734*   | Managing Digital Business        | 12 units/4 credits |
| 95-720    | Information Systems Project      | 24 units/8 credits |
| Various** | Electives (pick 2)               | 24 units/8 credits |

\* 95-734 replaced 95-730 in 2019.



\*\* Can include other CMU courses in the GM offerings and pre-approved electives offered by other GM TEP partner universities.

#### 4.5.3 General Motors Business Intelligence & Data Analytics (MSIT-GBI aka MSIT-BIDA)

This major was added by GM TEP in Spring 2018:

|           |  |                     |
|-----------|--|---------------------|
| 95-703    | Database Management                      | 12 units/4 credits  |
| 95-710    | Economic Analysis                        | 6 units/2 credits   |
| 95-796    | Statistics for IT Managers               | 6 units/2 credits   |
| 94-806    | Privacy in the Digital Age               | 6 units/2 credits   |
| 95-797    | Data Warehousing                         | 6 units/2 credits   |
| 95-868    | Exploring and Visualizing Data (using R) | 6 units/2 credits   |
| 95-791    | Data Mining                              | 6 units/2 credits   |
| 95-865*   | Unstructured Data Analytics              | 6 units/2 credits   |
| 95-866    | Advanced Business Analytics              | 6 units/2 credits   |
| 95-720    | Information Systems Project              | 24 units/8 credits  |
| Various** | Electives                                | 60 units/20 credits |

\* 95-865 replaced 95-852 Applied Data Science in 2019.

\*\* Can include other CMU courses in the GM offerings and pre-approved electives offered by other GM TEP partner universities.

#### 4.5.4 General Motors Information Security & Assurance (MSIT-GSA or MSIT-ISA)

This major was added by GM in Fall 2018:

|          |  |                     |
|----------|--|---------------------|
| 95-752   | Intro to Information Security Management | 12 units/4 credits  |
| 95-705   | Telecommunications Management            | 12 units/4 credits  |
| 94-806   | Privacy in the Digital Age               | 6 units/2 credits   |
| 95-755   | Information Security Risk Management I   | 6 units/2 credits   |
| 95-744   | Cyber Security Policy and Governance I   | 6 units/2 credits   |
| 95-748   | Software and Security                    | 6 units/2 credits   |
| 95-758   | Network and Internet Security            | 12 units/4 credits  |
| 95-720   | Information Systems Project              | 24 units/8 credits  |
| Various* | Electives                                | 60 units/20 credits |

\* Can include other CMU courses in the GM offerings and pre-approved electives offered by other GM TEP partner universities.

#### 4.5.5 Dual Degree with Tec de Monterrey (MSIT-MTI)

This dual degree distance program with Instituto Tecnológico y de Estudios Superiores de Monterrey, México (ITESM) requires students to complete 96 units from each university by

following a prescribed plan of study with their cohort. ITESM will transfer all 96 units of MSIT credit towards their MTI degree; Heinz College will transfer 48 units of ITESM credit to count towards completion of the 144 units required for the MSIT degree. Students cannot earn one degree without successful completion of the other. There are also no course exemptions, electives or independent study allowed in this program. It will be ending December 2020; no new students were admitted after Fall 2018.

The MSIT-MTI dual degree program requires successful completion of the following 96 units of MSIT coursework (plus completion of ITESM's MTI degree):

|         |                                       |          |
|---------|---------------------------------------|----------|
| 95-805  | Business Communications               | 6 units  |
| 95-833  | Global IT Mgmt, Sourcing & Automation | 12 units |
| 95-703  | Database Management                   | 12 units |
| 95-710  | Economic Analysis                     | 6 units  |
| 95-808  | IT Project Management                 | 6 units  |
| 95-705  | Telecommunications Management         | 12 units |
| 95-796  | Statistics for IT Managers            | 6 units  |
| 95-797  | Data Warehousing                      | 6 units  |
| 95-760  | Decision Making under Uncertainty     | 6 units  |
| 95-872* | Art and Science of Business Analytics | 6 units  |
| 95-831* | Enterprise Architectures              | 6 units  |
| 95-722  | Digital Transformation                | 6 units  |
| 95-774  | Business Process Modeling             | 6 units  |

\* 95-872 and 95-831 were substituted with 95-752 Intro to Info Security Mgmt in 2019.

## 5 STATEMENT OF ASSURANCE

Carnegie Mellon University does not discriminate in admission, employment, or administration of its programs or activities on the basis of race, color, national origin, sex, handicap or disability, age, sexual orientation, gender identity, religion, creed, ancestry, belief, veteran status, or genetic information. Furthermore, Carnegie Mellon University does not discriminate and is required not to discriminate in violation of federal, state, or local laws or executive orders.

Inquiries concerning the application of and compliance with this statement should be directed to the vice president for campus affairs, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213, telephone 412-268-2056.

Obtain general information about Carnegie Mellon University by calling 412-268-2000.

The Statement of Assurance can also be found on-line at:

<https://www.cmu.edu/policies/administrative-and-governance/statement-of-assurance.html>.