Carnegie Mellon University
HeinzCollege
INFORMATION SYSTEMS • PUBLIC POLICY • MANAGEMENT

Academic Year 2024-2025

Master of Information Systems Management (MISM) Handbook Addendum
Updated 10/8/2024

Degree Programs Covered by This Handbook:
MISM (16 Month)
MISM 12 (12 Month)
MISM BIDA (16 Month)
BIDA 12 (12 Month)

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1. Introduction

This handbook provides specific information on the curriculum and program requirements for the Master of Information Systems (MISM) program. The Heinz College also publishes a separate handbook which 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.

While this handbook is specific to your academic experience in the department, it is just one element of the Graduate Student Handbook Suite. There are several other resources within the suite that you should consult when needed:

- The Heinz College Handbook
- University-Wide Graduate Student Handbook (Office of Graduate & Postdoctoral Affairs)
- The Word Student Handbook

2. Department Personnel

The staff listed below are directly associated with the MISM programs. There is a robust team at Heinz College and CMU available to help you navigate your education, from financial aid and student services to disability services and more.

Andrew Wasser	Associate Dean, School of Information Systems and Management	wasser1@andrew.cmu.edu
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3. Master of Information Systems Management (MISM) Curriculum

It is the student's responsibility to know and understand the policies contained in this MISM Handbook Addendum, the [Heinz College Handbook](#), and the [CMU Graduate Student Handbook](#). All three combined cover CMU university policies and procedures along with specific Heinz College policies.

As a full-time graduate student, you will normally complete the MISM program in three semesters. Note, the MISM program is not offered part-time. Students admitted to the 12 or 16-month track will complete 162 units in three semesters.

The MISM curriculum is structured with required Information Systems (IS) courses, required Management courses, and required elective courses.

In order to successfully complete the MISM program, you must complete the following:

- all required courses (unless you exempt them);
- one approved Analytic elective course; and
- all other standards for graduation, including meeting the minimum cumulative grade point average of 3.0, and meeting the minimum total number of units taken over three semesters (based upon track).

3.1. Required Courses

The following table lists all the required core courses MISM students must complete.

MISM 12 and 16-month track (114 core + 48 elective = 162 total units)		
Course Number	*Course Title*	*Units*
94-700	Organizational Design & Implementation	6
95-702	Distributed Systems for ISM	12
95-703	Database Management	12
95-710	Economic Analysis	6
95-712	Object Oriented Programming in Java	12
95-717*	Writing for ISM*	6
95-718 or 94-718	Professional Speaking or Communication in XR	6
95-719	Accounting & Finance Analytics	6
95-720	Information Systems Project	18

95-722	Digital Transformation	6
95-723	Managing Disruptive Technologies	6
95-760	Decision Making Under Uncertainty	6
95-796	Statistics for IT Managers	6
95-706 *OR* 95-874 *OR* 94-866	Object Oriented Analysis & Design *OR* Agile Methods *OR* Design Thinking	6

* Students will be placed into 'Business Writing' or 'Writing for ISM' based upon their standardized test scores.

3.2. Analytic Elective Course

MISM students are required to take <u>one approved Analytic elective course from the following list</u>. Several courses offered by Heinz College and the MISM program will satisfy this requirement. In addition, the School of Computer Science, and other Carnegie Mellon departments offer graduate-level courses that *may* satisfy this requirement. Check with your Program Director before registering for a course from another academic department if you wish to count it as your Analytic elective course. Official approval from the Program Director is required for any course not listed below.

94-834	Applied Econometrics I	6 units
94-870	Telling Stories with Data	6 units
94-881	Managing Analytic Projects	6 units
95-736	Advanced Relational Database Management	6 units
95-737	NoSQL Database Management	6 units
95-771	Data Structures & Algorithms	12 units
95-797	Data Warehousing	6 units
95-819	A/B Testing, Design and Analysis	6 units
95-832	Marketing Analytics	6 units
95-851	Making Products Count: Data Science for Product Managers	6 units
95-865	Unstructured Data Analytics	6 units
95-866	Advanced Business Analytics	6 units
95-868	Applied Exploratory Data Analysis	6 units
95-869	Big Data and Large-scale Computing	6 units
95-885	Data Science and Big Data	12 units

3.3. Sample of General Elective Courses

The following is a sample of general electives offered by Heinz College and the MISM program. Please review the [Heinz College Course Catalog](#) for an exhaustive search.

95-729	E-Commerce Tech, Machine Learning, Analytics & Bots	6 units
95-733	Internet of Things	6 units
95-746	Cloud Security	6 units
95-775	IT Business Leadership	6 units
95-794	Tech Startup: Market Discovery	6 units
95-798	Tech Startup: Build Your Company	6 units
95-799	Linux and Open Source	6 units
95-808	IT Project Management	6 units
95-888	Data Focused Python	6 units
94-732	Managing Disruption in Media & Entertainment	6 units
94-800	Negotiation	6 units
94-802	Geographic Information Systems	12 units
94-803	Consulting Lab	6 units
94-823	Measuring Social	12 units
94-842	Programming R for Analytics	6 units

To fulfill the elective requirements for graduation, you may take relevant graduate-level courses outside of Heinz College. **Up to 36 units** of graduate-level courses outside of Heinz College may be counted towards the MISM degree requirements.

Language (Spanish, French, etc.), Music (piano, violin, voice, etc.), and Physical Education (golf, dance, etc.) coursework <u>does not</u> count as general electives towards the MISM degree requirements.

Undergraduate coursework <u>does not</u> count as general electives towards the MISM degree requirements. If a course is cross-listed as both an undergraduate and graduate course, make sure to enroll in the graduate course to receive credit towards your degree requirements.

4. Specializations

MISM students who wish to complete a specialization are NOT required to take elective courses in addition to the courses required for a specialization. Thus, students will be able to complete both

the degree and the specialization requirements without exceeding the minimum total units for their track. However, you should consult your advisor and plan your course selection very carefully to make this possible since the maximum units taken each semester may not exceed 54 for any track. Please note, declaring a specialization is NOT required. Students can complete the MISM program without a specialization.

4.1. Specialization in Managing AI and Robotics

Advancements in software and hardware-based agents have transformed the workplace and society by harnessing the power of artificial intelligence and robotic automation. Industry leaders must understand how the interaction of these forces will transform their organizations into the future. The Managing AI and Robotics specialization will help students identify, develop, and manage the policies and processes associated with these advancements.

4.1.1. Course Requirements

MISM Students wishing to complete a specialization in Managing AI and Robotics while pursuing their degree must complete 42 units of course work from the following list:

- Introduction to Artificial Intelligence (6 units)
- AI & Emerging Economies (12 units)
- Advances in Robotic Process Automation (6 units)
- Critical AI Studies for Public Policy (6 units)
- Cybersecurity for AI & ML (6 units)
- E-commerce Tech, Machine Learning, Analytics, and Bots (6 units)

Students may substitute up to 12 units using coursework from other departments. Contact the program director for more information.

4.2. Specialization in Business Intelligence

As Information Technology has become more widely deployed in organizations, opportunities arise for collecting and storing data contributed by human users (e.g., blogs, knowledge management systems, wikis) as well as the date produced as a side effect of the use of systems (e.g., transactional data, click stream data, system logs) by customers, suppliers, and internal staff. Taking advantage of these opportunities requires paying

attention to organizational issues (e.g., incentives for contribution to knowledge management systems) as well as a number of technical issues (e.g., data quality, middleware and systems integration, data and text mining).

Business Intelligence is about addressing these challenges and using analytics to address a range of strategic, tactical, and operational planning problems. This specialization in BI prepares you to address the technical, strategic, and managerial issues associated with the extraction, transformation, representation, and analysis of data.

4.2.1. Course Requirements

MISM Students wishing to complete a specialization in Business Intelligence while pursuing their degree must complete the following 42 units of course work:

- Data Structures and Algorithms (12 units)
- Advanced Relational Database Management (6 units)

and at least 24 units from the following:

- Geographic Information Systems (12 units)
- NoSQL Database Management (6 units)
- A/B Testing, Design, and Analysis (6 units)
- Marketing Analytics (6 units)
- Time Series Forecasting in Python (6 units)

4.3. Specialization in Digital Marketing and Commerce

The Internet has given rise to new organizational forms (e.g., virtual organizations) and markets which feature electronic transaction models in new categories of products and services which include consumer-business, business-business and intra-organizational commerce in physical as well as digital products. With the increased popularity and significance of the Internet, most organizations will need to carefully study this technology in order to develop strategies best suited to their context.

Successful Digital Marketing and Commerce involves blending technological, marketing and management practices in ways that are fundamentally new considering issues (e.g., copyright, privacy, content selection and rating, and intellectual property) that can have potentially profound implications for society.

4.3.1.   Course Requirements

MISM Students wishing to complete a specialization in Digital Marketing and Commerce while pursuing their degree must complete the following 42 units of course work:

- Measuring Social (12 units)
- Lean Innovation Lab (12 units)

and at least 18 units from following list:

- Managing Disruption in Media & Entertainment (6 units)
- E-Commerce Tech, Machine Learning, Analytics, and Bots (6 units) Cloud Security (6 units)
- Entrepreneurship: A New Venture (6 units) Tech Startup: Building Your Company (6 units) Tech Startup: Market Discovery (6 units)

4.4.   Specialization in IT Strategy and Management

The IT Strategy & Management specialization is geared for students with CIO aspirations. Students take a combination of leadership, process, and IT management classes to prepare them to lead organizations in today's complex, digital world. The focus of this concentration is on understanding and leveraging the connectivity across people, processes, and technology.

IT-enabled relationships and services are redefining organizational boundaries. This redefinition calls for a blended set of business, technology, and interpersonal skills.

4.4.1.   Course Requirements

MISM Students wishing to complete a specialization in IT Strategy and Management while pursuing their degree must complete 42 units of the following course work:

At least **24 units** from the following list:

- Making Products Count: Data Science for Product Managers (6 units)
- Negotiation (6 units)
- IT Project Management (6 units)
- Strategy Development (6 units)
- Marketing Analytics (6 units)

- IT Business Leadership (6 units)

<u>and</u>

- AT Kearney Tepper & MISM project alternative (18 units)

4.5. Specialization in Software Development

The critical role played by software in an organization's strategy necessitates that leaders understand and apply the best practices, principles, technologies, and tools to develop their software products and platforms. This specialization will help you acquire the foundational skills to develop high quality software products on a wide variety of platforms. This specialization is ideal for those pursuing a career in software design, development, and strategy.

4.5.1. Course Requirements

MISM Students wishing to complete a specialization in Software Development while pursuing their degree must complete 42 units of the following course work:

- Data Structures & Algorithms (12 units)
- Engineering Privacy in Software (12 units)
- Data Focused Python (6 units)

and at least 12 units from the following list:

- Software & Security (6 units)
- Internet of Things (6 units)
- Web Application Development (6 units)
- Enterprise Web Development (6 units)

Students may substitute up to 12 units using coursework from other departments. Contact the program director for more information.

5. Business Intelligence & Data Analytics (BIDA) Concentration

Students in the MISM-BIDA concentration acquire the skills to integrate cutting edge information and analytic technology practices with applied business methods. The program features a

cohesive blend of data analytics, management, strategy, and IT courses. MISM- BIDA graduates are cross-trained in business process analysis and skilled in predictive modeling, GIS mapping, analytical reporting, segmentation analysis, and data visualization.

Students admitted to the MISM-BIDA concentration (12 or 16-month track) will complete 162 units in three semesters.

Students may transfer to the MISM (non-BIDA) program. The pre-matriculation transfer deadline is June 1. The post-matriculation transfer deadline is October 15. Contact the [Program Director](#) for more information about the transfer process.

5.1. Course Requirements for Business Intelligence & Data Analytics (BIDA) Concentration

The following table lists all the required core courses MISM-BIDA students must complete.

BIDA 12 and 16-month BIDA track (132 core + 30 elective = 162 total units)		
Course Number	Course Title	Units
94-700	Organizational Design & Implementation	6
94-834	Applied Econometrics I	6
95-702	Distributed Systems for ISM	12
95-703	Database Management	12
95-710	Economic Analysis	6
95-712	Object Oriented Programming in Java	12
95-717*	Writing for ISM*	6
95-718 or 94-718	Professional Speaking or Communication in XR	6
95-719	Accounting & Finance Analytics	6
95-720	Data Analytics Project	18
95-722	Digital Transformation	6
95-760	Decision Making Under Uncertainty	6
95-796	Statistics for IT Managers	6
95-828	Machine Learning for Problem Solving	12
95-865	Unstructured Data Analytics	6
95-866	Advanced Business Analytics	6

* Students will also be placed into 'Business Writing' or 'Writing for ISM' based upon their standardized test scores.

6. Internship Requirement

MISM students starting in a 12-month track are not required to complete an internship. Students starting in the 16-month track are required to hold a summer internship after completing two semesters of the MISM program. The completion of an internship is a graduation requirement for the 16-month track.

Minimally, the internship requires 300 hours of full-time employment that has formal supervision, is professional in nature, includes work that is of importance to the organization, and has significant educational value.

- Students must attend an internship information session in the Spring semester hosted by Career Services to learn more about specific internship requirements and support given by Career Services.
- The internship duration is a minimum of 300 hours and is to be completed in the Summer between your first and second year only.
- Students may only report one internship unless otherwise approved by Career Services
- Internship must be reported no later than the last business day of June.
- Students must complete the Heinz Internship Extension Course administered by Career Services via Canvas. Students will be automatically enrolled and there will be associated modules with assignments in which completion of these modules is a requirement to pass the Internship Course.

Before beginning the internship, students must complete the online [Career Services Internship Reporting Form](#) for approval.

The internship will be verified with the students' supervisors and then approved. Students must notify their Career Advisor of any significant changes in their internships, such as length, location, hours of work, etc.

Once the internship has been approved, students will be registered for the zero-unit internship course. Students will not receive academic credit for the internship, but it will be reflected on their transcript as a course with P/F grade. At the end of your internship your [Career Services Advisor](#) will request that your supervisor complete an evaluation form about your internship performance. You are also required to complete an evaluation survey. If you do not successfully complete an eligible internship, you will not fulfill your internship requirement necessary for graduation.

F-1 Status Students: You must apply for Curricular Practical Training (CPT) employment authorization for your summer internship. CPT authorization is required regardless of the internship being paid or unpaid. CPT is only available to F-1 students who have not graduated and who have been enrolled on a full-time basis for one full academic year (i.e. fall and spring.) If your degree program requires you to complete a summer internship, you can qualify for CPT. Processing CPT may take up to 2 weeks and you cannot begin employment until you receive authorization. Guidelines, forms and instructions can be found at the OIE's [CPT Website](#).

6.1.1. Securing an Internship

If you are required to complete an internship, you will be responsible for securing a suitable internship. Career Services will provide assistance through counseling, workshops on resume preparation and interview skills, and listings of potential internships. You can make an appointment to discuss your situation and you are encouraged to come to workshops that cover the essential skills for finding the right internship.

7. IS Project Courses

Project courses are organized around significant management problems, the solution of which requires a mix of technological, organizational, and social skills. As opposed to the traditional classroom setting, project courses are organized as a group exercise in problem solving. Students are divided into teams guided by university department faculty.