

Carnegie Mellon University
HeinzCollege

INFORMATION SYSTEMS • PUBLIC POLICY • MANAGEMENT

Student
Handbook

2019 - 2020

Master of Information Systems
Management (MISM)

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1 MASTERS OF INFORMATION SYSTEMS MANAGEMENT (MISM) CURRICULUM

It is the student's responsibility to know and understand the policies contained in this [MISM Student Handbook](#) and the [Heinz College Handbook](#). As a full-time graduate student, you will normally complete the MISM program in three or four 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.
Students admitted to the 21-month track will complete 192 units in four 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 or four semesters (based upon track).

1.1 Required Courses

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

MISM 12 and 16-month track (120 core + 42 elective = 162 total units)		
<i>Course Number</i>	<i>Course Title</i>	<i>Units</i>
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
95-715	Financial Accounting	6
95-716	Principles of Finance	6
95-717*	Writing for ISM*	6
95-718	Professional Speaking	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# <u>OR</u> 95-874 <u>OR</u> 94-866	Object Oriented Analysis & Design# <u>OR</u> Agile Methods <u>OR</u> Design Thinking	6
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MISM 21-month track (126 core + 66 elective = 192 total units)		
<i>Course Number</i>	<i>Course Title</i>	<i>Units</i>
94-700	Organizational Design & Implementation	6
94-702	Professional Writing	6
94-718	Strategic Presentation Skills	6
95-702	Distributed Systems for ISM	12
95-703	Database Management	12
95-705	Telecommunications Management	12
95-710	Economic Analysis	6
95-712	Object Oriented Programming in Java	12
95-715	Financial Accounting	6
95-716	Principles of Finance	6
95-720#	Information Systems Project#	18
95-722	Digital Transformation	6
95-760	Decision Making Under Uncertainty	6
95-796	Statistics for IT Managers	6
95-706# <u>OR</u> 95-874 <u>OR</u> 94-866	Object Oriented Analysis & Design# <u>OR</u> Agile Methods <u>OR</u> Design Thinking	6

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

Students may satisfy the Object Oriented Analysis and Design and Information Systems Project requirement by taking the following three courses: Data Structures and Algorithms (95-771), Design & Engineering of Intelligent Information Systems (11-791), and Intelligent Information Systems Project (11-792).

1.2 Analytic Elective Course

MISM students are required to take one approved Analytic elective course from the following list. A number of 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 here.

94-832	Business Intelligence & Data Mining SAS	6 units
94-834	Applied Econometrics I	6 units
94-870	Telling Stories with Data	6 units
95-736	Advanced Relational Database Management	6 units
95-737	NoSQL Database Management	6 units
95-771	Data Structures & Algorithms	12 units
95-791	Data Mining	6 units
95-797	Data Warehousing	6 units
95-819	A/B Testing, Design and Analysis	6 units
95-832	Marketing Analytics	6 units
95-845	Analytics Practicum: Machine Learning for Health Care	12 units
95-851	Making Products Count: Data Science for Project Mangers	6 units
95-865	Unstructured Data Analytics	6 units
95-866	Advanced Business Analytics	6 units
95-868	Exploring and Visualizing Data	6 units
95-869	Big Data and Large-scale Computing	6 units
95-870	Managing Analytics Projects	6 units
95-885	Data Science and Big Data	12 units

1.3 Sample of General Elective Courses

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

95-729	E-Commerce Tech, Machine Learning, Analytics & Bots	6 units
95-732	Marketing Digital Media	6 units
95-733	Internet of Things	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
95-881	Web Application Development	6 units
95-888	Data Focused Python	6 units
94-706	Healthcare Information Systems	12 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
94-840	Lean Entrepreneurship	6 units
94-842	Programming R for Analytics	6 units
11-791	Design & Engineering of Intelligent Information Systems	12 units
11-792	Intelligent Information Systems Project	12 units

2 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 in order 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.

2.1 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.

2.1.1 Course Requirements for Specialization in Managing AI and Robotics

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

- Introduction to Artificial Intelligence (12 units)
- Robotic Process Automation (6 units)
- Deep Learning for Information Systems Management (6 units)
- AI, Society, and Humanity (12 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.

2.2 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 data 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.

2.2.1 Course Requirements for Specialization in Business Intelligence

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)
- Data Mining (6 units)

AND

- At least 24 units from the following:
 - Geographic Information Systems (12 units)
 - Advanced Relational Database Management (6 units)
 - NoSQL Database Management (6 units)
 - Data Warehousing (6 units)
 - Business Process Modeling (6 units)
 - Marketing Analytics (6 units)

2.3 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.

2.3.1 Course Requirements for Specialization in Digital Marketing and Commerce

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)
- Marketing Digital Media (6 units)
- E-Commerce Tech, Machine Learning, Analytics, and Bots (6 units)

AND

- At least 18 units from following list:
 - Data Mining (6 units)
 - Network & Internet Security (12 units)
 - Lean Entrepreneurship (6 units)
 - Business Process Modeling (6 units)
 - Tech Startup: Market Discovery (6 units)

2.4 Specialization in Healthcare Informatics

As hospitals, insurers, governments, and consumers press for more effective treatments, more efficient providers, and cheaper healthcare, the importance of effectively collecting, managing, and analyzing information grows. The challenges associated with combining biological, medical and healthcare knowledge, organizational management, strategic analysis, and technological innovation into effective systems is the subject of healthcare informatics. In recent years, there has been an explosion in person-specific data. Having so much data available has allowed knowledge discovery in data (or data mining) to take a central stage.

Many other and diverse new areas are simultaneously emerging. As a result, healthcare informatics is simultaneously promoting diverse areas such as:

- a. Decision making and decision support
- b. Healthcare information technology adoption and diffusion

- c. Public health informatics
- d. Social and digital analytics in healthcare.

2.4.1 Course Requirements for Specialization in Healthcare Informatics

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

- Health Economics (12 units)
- Healthcare Information Systems (12 units)

AND

- At least 18 units from the following list:
 - Introduction to Information Security Management (12 units)
 - Data Mining (6 units)
 - Advanced Relational Database Management (6 units)
 - NoSQL Database Management (6 units)
 - Privacy in the Digital Age (6 units)
 - Data Warehousing (6 units)
 - Business Process Modeling (6 units)
 - Measuring Social (12 units)

2.5 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 organization 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.

2.5.1 Course Requirements for Specialization in IT Strategy and Management

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:

- Business Process Modeling (6 units)
- Negotiation (6 units)
- IT Project Management (6 units)
- Strategy Development (6 units)
- Marketing Analytics (6 units)
- IT Business Leadership (6 units)
- Introduction to Supply Chain Management and Systems (6 units)
- Product Management for Information Technology (6 units)

AND

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

3 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 will complete 162 units in three semesters.

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

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

MISM 12 and 16-month BIDA track (132 core + 30 elective = 162 total units)		
<i>Course Number</i>	<i>Course Title</i>	<i>Units</i>
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	Professional Speaking	6
95-719	Accounting & Finance Foundations	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 be placed into Business Writing or Writing for ISM based upon their standardized test scores.

4 INTERNSHIP REQUIREMENT

MISM students starting in a 12-month track are not required to complete an internship. Students starting in the 16-month and 21-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 and 21-month tracks.

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.

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 as well as a self-reflection statement describing how your internship fulfilled the educational goals of the program. If you do not successfully complete an eligible internship along with your survey and self-evaluation, you will not fulfill your internship requirement necessary for graduation.

F1 Visa 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 [Office of International Education's website](#).

4.1.1 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.

5 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.

Students may satisfy the Information Systems Project together with the Object Oriented Analysis and Design requirement by the following three courses: Data Structures and Algorithms, Design & Engineering of Intelligent Information Systems, and Intelligent Information Systems Project.

Data Structures and Algorithms is a pre-requisite or co-requisite for the Software Engineering sequence. Content of Design & Engineering of Intelligent Information Systems overlaps significantly with the content of Object Oriented Analysis and Design (OOAD) and hence you can exempt OOAD by taking Design & Engineering of Intelligent Information Systems.

6 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 online at:

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