Carnegie Mellon University
Heinz College
INFORMATION SYSTEMS • PUBLIC POLICY • MANAGEMENT

Student Handbook

2016 - 2017

Master of Information Systems Management (MISM)

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1 MASTERS OF INFORMATION SYSTEMS MANAGEMENT (MISM) CURRICULUM

You will normally complete the MISM program in three semesters. The MISM curriculum is structured with required Information Systems (IS) courses, required Management courses and elective courses.

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

- 180 units of course credit;
- all required courses (unless you exempt them);
- 48 units of elective courses; and
- all other standards for graduation, including meeting minimum grade point averages.

MISM students who 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 requirements and the specialization requirements with 180 units of coursework. 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 60.

1.1 Required Courses

The following is a sample schedule with all the required courses students must complete.

First Semester:

95 – 703	Database Management	12 units
95 – 710	Economic Analysis	6 units
95 – 712	Object Oriented Programming in Java	12 units
95 – 718	Professional Speaking	6 units
95 – 796	Statistics for IT Managers	6 units
94 – 70x	Business English / Professional Writing*	6 units
94 – 700	Organizational Design & Implementation	6 units
xx – xxx	Elective	6 units

Second Semester:

95 – 702	Distributed Systems for ISM	12 units
95 – 715	Financial Accounting	6 units
95 – 716	Principles of Finance	6 units
95 – 723	Managing Disruptive Technologies	12 units
95 – 760	Decision Making Under Uncertainty	6 units
xx – xxx	Elective	18 units

Third Semester:

95 – 720 Information Systems Project#	24 units
95 – 706 Object Oriented Analysis and Design#	6 units
95 – 722 Digital Transformation	6 units
xx – xxx Elective	24 units

* Students will be placed into Business English or Professional Writing.
# Students may satisfy the Object Oriented Analysis and Design and Information Systems Project requirement by 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 Specialization in Information Security Management

The security of data, systems, and networks has become one of the most crucial managerial, organizational, and policy issues in the country today. This specialization integrates technical, managerial and policy issues in information security and assurance. Classes in the ISM specialization are taught by faculty from the Heinz College and renowned experts in information security from the Software Engineering Institute's CERT Coordination Center.

1.2.1 Course Requirements for Specialization in Information Security Management

MISM Students wishing to complete a specialization in Information Security Management while pursuing their degree must complete the following 48 units of course work:

- Introduction to Information Security Management (12 units)

AND

- At least 36 units from the following:
  - Privacy in the Digital Age (6 units)
  - Information Security Policy & Governance (6 units)
  - Information Security Risk Management (6 units)
  - Network & Internet Security (12 units)
  - Usable Privacy and Security (12 units)
  - Applied Information Assurance (12 units)
  - Host Based Forensics (12 units)
  - Network Situational Awareness (12 units)
  - Ethical Penetration Testing (6 units)

1.3 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.

1.3.1 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 48 units of course work:

- Data Structures and Algorithms (12 units)
- Data Mining (6 units)
- Data Warehousing (6 units)
- Applied Data Science (6 units)

AND

- At least 18 units from the following:
  Geographic Information Systems (12 units)
  Advanced Relational Database Management (6 units)
  NoSQL Database Management (6 units)
  Business Process Modeling (6 units)
  Marketing and Digital Strategy (6 units)
  Large Scale Data Analysis for Public Policy (6 units)

1.4 Specialization in Electronic 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 Electronic 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.

1.4.1 Course Requirements for Specialization in Electronic Commerce

MISM Students wishing to complete a specialization in Electronic Commerce while pursuing their degree must complete the following 48 units of course work:

- Measuring Social (12 units)
- Marketing Digital Media (6 units)
- E-Commerce Technologies (6 units) or Service Oriented Architectures (6 units)

AND

- At least 24 units from following list:
  Data Mining (6 units)
  Network & Internet Security (12 units)
  Lean Entrepreneurship (6 units)
  Business Process Modeling (6 units)
  Tech Startup: Tools & Techniques (6 units)

1.5 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.

1.5.1 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 48 units of course work:

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

AND

- At least 24 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)
  Healthcare Informatics Project course (24 units)

* Health Economics takes the place of Economic Analysis requirement

1.6 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.

1.6.1 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 48 units of the following course work:

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

AND

- Students are required to join the AT Kearney/Tepper/MISM project alternative

1.7 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.

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

The following is a sample schedule with all the required courses MISM-BIDA students must complete.

First Semester:

95 – 703 Database Management	12 units
95 – 712 Object Oriented Programming in Java	12 units
95 – 718 Professional Speaking	6 units
95 – 796 Statistics for IT Managers	6 units
94 – 834 Applied Econometrics I	6 units
94 – 700 Organizational Design & Implementation	6 units
xx – xxx Elective	12 units

Second Semester:

95 – 702 Distributed Systems for ISM	12 units
95 – 710 Economic Analysis	6 units

95 – 719	Accounting and Finance Foundations	6 units
95 – 797	Data Warehousing	6 units
95 – 866	Advanced Business Analytics	6 units
95 – XXX	Machine Learning for Problem Solving	12 units
94 – 70x	Business English / Professional Writing*	6 units
xx – xxx	Elective	6 units

Third Semester:

95 – 722	Digital Transformation	6 units
95 – 760	Decision Making Under Uncertainty	6 units
95 – 720	Data Analytics Capstone Project	24 units
xx – xxx	Elective	24 units

* Students will be placed into Business English or Professional Writing.

1.8 Elective Courses

Students in MISM program are required to take at least 48 units of elective courses. A number of courses offered by the MISM Program and the Heinz College will satisfy this requirement. In addition, the School of Computer Science, and other Carnegie Mellon departments offer courses that may satisfy this requirement. Check with your advisor before registering for a course from another academic unit if you wish to have it serve as an elective.

1.8.1 Sample of Elective Courses

95-729	E-Commerce Technologies	6 units
95-732	Marketing Digital Media	6 units
95-733	Internet Technologies	6 units
95-736	Advanced Relational Database Management	6 units
95-737	NoSQL Database Management	6 units
95-771	Data Structures and Algorithms	12 units
95-775	IT Business Leadership	6 units
95-794	Tech Startup: Tools and Techniques	6 units
95-797	Data Warehousing	6 units
95-808	IT Project Management	6 units
95-831	Enterprise Architectures	6 units
95-865	Text Analytics	6 units
95-869	Hadoop and MapReduce	6 units
95-880	Python for Developers	6 units
95-881	Web Application Development	6 units

94-706	Healthcare Information Systems	12 units
94-800	Negotiation	6 units
94-802	Geographic Information Systems	12 units
94-803	Consulting Communications	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 INTERNSHIP REQUIREMENT

MISM students starting in the summer semester are not required to do an internship. Students starting in the fall semester are required to do a summer internship after completing two semesters of the MISM program. The completion of an internship is a graduation requirement.

Minimally, the internship requires the equivalent of ten weeks (280 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. If a student plans to exempt the internship, they will need to complete the Petition for Course Exemption.
Near the end of the internship, the Career Services Office will request supervisors to complete a Student Performance Evaluation Form.

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.

2.1.1 Securing an Internship

If you are required to do 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.

3 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.