

# INFORMATION SYSTEMS AND TECHNOLOGY

The program may be completed entirely on campus, entirely online, or through a combination of on-campus and online courses.

## Admission

Bachelor's degree in engineering, a physical science, computer science, applied mathematics, business administration, or liberal arts with a minimum cumulative GPA of 3.0 or higher

### Prerequisite Courses

- A course in Data Structures (IMSE 350/351, CIS 350/352, or equivalent)
- A course in computer programming, such as C++, Java/JavaScript, C#, or Python (IMSE 255, IMSE/CIS 150/200, CIS 205 or equivalent)

These course requirements may be completed after admission into the program.

The MS in IS&T program is a response to the need of students who want to complement, extend, and integrate technical and organizational knowledge on information systems. The program designed meet the need of the industry to incorporate enterprise wide information systems to be competitive in the global market place. Students who possess either technical knowledge about computers and information systems, or knowledge about information needs and information system requirements in organizations, but who want to expand their knowledge in a constructive way, constitute an important part of the intended audience.

## The degree aims to achieve simultaneously the following educational goals.

1. Provide access to advances in the information systems field.
2. Provide necessary skills to effectively integrate information technology in organizations.
3. Provide training in specialized areas of information systems and technology.

## Degree Requirements

The degree MS in IS&T requires a minimum of 30 credit hours.

- A minimum of a 3.0 cumulative GPA or higher is required at the time of graduation.
- Courses in which grades of C- or below are earned cannot be used to fulfill degree requirements.

## Advanced Standing

Up to six graduate credit hours (grade of B or better) may be transferred from another accredited institution.

Students may transfer up to one-half (1/2) the minimum number of credit hours required for their master's or professional degree from another University of Michigan program.

Graduate Academic Policies can be found below:

<http://catalog.umd.umich.edu/academic-policies-graduate/> (<http://catalog.umd.umich.edu/academic-policies-graduate/>)

### Program Requirements

The program of study must satisfy the following distribution and course requirements:

### Core Courses

Code	Title	Credit Hours
IMSE 556 or CIS 556	Database Systems	3
IMSE 570 or CIS 564	Enterprise Information Systems	3
IMSE 5725 or CIS 572	Object Oriented System Design	3
<b>Total Credit Hours</b>		<b>9</b>

### Concentration (15 credit hours)

Seven concentration areas exist in the program. Six of the concentration areas are identified below while the seventh is an individual concentration that student develops jointly with the Program Advisor.

#### Concentration Area 1: Information Management Applications (Students are required to take any 5 courses from the following list)

Code	Title	Credit Hours
HCDE 530	Information Visualization	3
IMSE 515	Fundamentals of Program Mgt	3
IMSE 516	Project Management and Control	3
IMSE 5215	Program Budget, Cost Est & Con	3
IMSE/CIS 555	Decision Support/Expert Sys	3
IMSE 564	Applied Data Analytics and Modeling for Enterprise Systems	3
IMSE 5715	Modeling of Int Info Syst	3
IMSE 5755	Bus Proc Int using Entrpr Tech	3
IMSE 586	Big Data Aanal & Visuliztn	3
ACC 505	Devel & Interp Financial Info	3
HRM 561	Human Resource Management	3
MKT 515	Marketing Management	3

#### Concentration Area 2: Supply Chain and Information Systems Design (Students are required to take any 5 courses from the following list)

Code	Title	Credit Hours
CIS 544	Computer and Network Security	3
IMSE 538	Intelligent Manufacturing	3
IMSE/CIS 555	Decision Support/Expert Sys	3
IMSE 559	System Simulation	3
IMSE 5655	Supply Chain Management	3
IMSE 5715	Modeling of Int Info Syst	3
IMSE 5755	Bus Proc Int using Entrpr Tech	3
IMSE 580	Prod & Oper Engineering I	3

IMSE 581	Prod & Oper Engineering II	3
IMSE 586	Big Data Aanal & Visuliztn	3

**Concentration Area 3: Information Security (Students are required to take any 5 courses from the following list)**

Code	Title	Credit Hours
CIS 527	Computer Networks	3
CIS 535	Wireless Technologies and Pervasive Computing	3
CIS 540	Foundation of Information Security	3
CIS 544	Computer and Network Security	3
CIS 545	Data Security and Privacy	3
CIS 546	Security and Privacy in Wireless Networks	3
CIS 548	Security and Privacy in Cloud Computing	3
CIS 565	Software Quality Assurance	3
CIS 568	Data Mining	3
or ECE 537	Data Mining	
CIS 584	Advanced Computer and Network Security	3
IMSE 5715	Modeling of Int Info Syst	3

**Concentration Area 4: Web Information Management (Students are required to take any 5 courses from the following list)**

Code	Title	Credit Hours
CIS 525	Web Technology	3
CIS 534	Semantic Web	3
CIS 535	Wireless Technologies and Pervasive Computing	3
CIS 550	Object-Oriented Programming and Its Applications	3
CIS 559	Principles of Social Network Science	3
CIS 562	Web Information Management	3
CIS 571	Web Services	3
CIS 575	Software Engineering Mgmt	3
CIS 586	Advanced Data Management	3

**Concentration Area 5: Information Systems Engineering (Students are required to take any 5 courses from the following list)**

Code	Title	Credit Hours
IMSE 5715	Modeling of Int Info Syst	3
IMSE 577	Human-Computer Interaction	3
or CIS 577	S/W User Interface Dsgn&Analys	
CIS 527	Computer Networks	3
CIS 544	Computer and Network Security	3
CIS 550	Object-Oriented Programming and Its Applications	3
CIS 553	Software Engineering	3
CIS 568	Data Mining	3
or ECE 537	Data Mining	
CIS 578	Advanced Operating Systems	3
CIS 586	Advanced Data Management	3

**Concentration Area 6: Data Analytics and Science (Students are required to take any 5 courses from the following list)**

Code	Title	Credit Hours
IMSE 500	Models of Oper Research	3
IMSE 505	Optimization	3

IMSE 514	Multivariate Statistics	3
IMSE 586	Big Data Aanal & Visuliztn	3
IMSE 605	Advanced Optimization	3
CIS 5570	Introduction to Big Data	3
CIS 568	Data Mining	3
or ECE 537	Data Mining	
CIS 5700	Advanced Data Mining	3
CIS 579	Artificial Intelligence	3
CIS 583	Deep Learning	3
ECE 5831	Pat Rec & Neural Netwks	3
CIS 585	Advanced Artificial Intelligence	3

**Concentration Area 7: Individual Concentration**

Select 5 courses from Areas 1 through 6. Requires Advisor's approval.

**Electives (6 credit hours)**

Other CIS, ECE, IMSE and business graduate courses may be taken per advisor approval.

A thesis may be substituted for six hours of electives, on approval by the program director.

**Learning Goals**

1. Provide access to advances in the information systems field.
2. Provide necessary skills to effectively integrate information technology in organizations.
3. Provide training in specialized areas of information systems and technology.