MASTER OF SCIENCE IN COMPUTATIONAL DECISION SCIENCES AND OPERATIONS RESEARCH

Collaborative program with the Department of Computer Science

The purpose of this program is to provide students with theoretical skills and knowledge of applications in the areas of optimization, game theory, and machine learning to enable them to contribute towards making business decisions more efficient, or alternatively, to enable them to pursue research in these areas.

Admission Requirements

Students with bachelor of science degrees in mathematics, computer science, industrial engineering, electrical and computer engineering, mechanical engineering, and business, or related areas, with a minimum cumulative GPA of at least 3.0/4.0, will be considered. Prospective students should have knowledge of linear algebra, discrete mathematics, probability and statistics, and programming.

All applications will be considered on an individual basis and strong applicants without an adequate background might be admitted with a requirement to take additional prerequisite courses. A statement of objectives and a curriculum vitae must be submitted. Two letters of recommendation are required. GRE scores must meet Illinois Institute of Technology institutional requirements.

Curriculum

Coursework includes 12 credit hours of required core courses and 20 credit hours of elective courses. Up to 12 credit hours of 400-level coursework may be included in the program with adviser approval. A student may, with permission of a thesis adviser, include in his or her program a thesis of up to five credit hours consisting of a combination of CS 591 and/or MATH 591. The thesis option requires a written thesis and an oral defense of the thesis. Thesis format and deadlines are set by the Graduate College.

Code	Title	Credit Hours
Core Courses		**(12)**
CS 430	Introduction to Algorithms	3
or CS 535	Design and Analysis of Algorithms	
MATH 481	Introduction to Stochastic Processes	3
or MATH 564	Regression	
or MATH 565	Monte Carlo Methods	
CS 539	Game Theory: Algorithms and Applications	3
or CS 584	Machine Learning	
or MBA 505	Microeconomics and Game Theory	
or MATH 522	Mathematical Modeling	
CS 538	Combinatorial Optimization	3
or MATH 535	Optimization I	
Computing Sciences Electives		**(3)**
Select a minimum of one course from the following or from any CS core courses not used to fulfill the core requirements :		3
CS 422	Data Mining	3
CS 425	Database Organization	3
CS 520	Data Integration, Warehousing, and Provenance	3
CS 522	Advanced Data Mining	3
CS 525	Advanced Database Organization	3
CS 529	Information Retrieval	3
CS 554	Data-Intensive Computing	3
CS 577	Deep Learning	3
CS 579	Online Social Network Analysis	3
CS 583	Probabilistic Graphical Models	3
CS 585	Natural Language Processing	3
CS 595	Topics in Computer Science	3
CS 597	Reading and Special Problems	1-3
Applied Math Electives		**(3)**
Select a minimum of one course from the following or from any MATH core courses not used to fulfill the core requirements :		3
MATH 483	Design and Analysis of Experiments	3
MATH 485	Introduction to Mathematical Finance	3
MATH 522	Mathematical Modeling	3
MATH 546	Introduction to Time Series	3
MATH 548	Mathematical Finance I	3
MATH 553	Discrete Applied Mathematics I	3
MATH 554	Modern Methods in Discrete Applied Mathematics	3
MATH 569	Statistical Learning	3
MATH 574	Bayesian Computational Statistics	3
MATH 597	Reading and Special Projects	1-3
Business and Application Electives		**(3)**
Select a minimum of one course from the following or from any MBA core courses not used to fulfill the core requirements :		3
BUS 510	Strategic Management	3
CAE 581	Algorithms in Transportation	3
MBA 504	Analytics for Decision Making	3
MBA 513	Operations and Technology Management	3
MBA 526	Supply Chain Management	3
MSC 511	Mathematical Economics I - Microeconomics	3
MSC 514	Mathematical Economics II - Microeconomics and Macroeconomics	3
Research		**(0-5)**

Select zero to five credit hours		0-5
CS 591	Research and Thesis of Masters Degree	1-5
	or MATH 591 Research and Thesis M.S.	
Additional Computational Decision Science and Operations Research Electives		**(6-11)**
Select 6-11 credit hours [1]		6-11

Minimum degree credits required: 32

[1] Courses listed under core courses may be used as an elective if it is not used to fulfill a core requirement. Note: CS 538 and MATH 535 cannot both be taken for credit. A maximum of five credit hours of CS 597 or MATH 597 may be used towards the elective requirement.