

# MASTER OF COMPUTER SCIENCE

This professional master's degree program consists of 30 credit hours of coursework in computer science. This program is designed for those without a prior degree in computer science, or those who are primarily interested in a (non-thesis) program preparing them for careers as working computer science professionals in business and industry. A full-time student with a background in computer science enrolled in the program should be able to complete the requirements in one to one-and-a-half years. Optional specializations in a number of areas are available.

## Curriculum

The Master of Computer Science degree program requires a core curriculum of nine credit hours and 21 credit hours of elective courses. At least 20 credit hours must come from 500-level CS/CSP courses.

Requirement	Credits
Minimum Degree Credits	30
Minimum Core Course Credits	9
Minimum 500-Level CS/CSP Credits	20

  

Code	Title	Credit Hours
<b>Programming Core Courses</b>		(3)
Select a minimum of one course from the following:		3
CS 511	Topics in Computer Graphics	3
CS 512	Computer Vision	3
CS 525	Advanced Database Organization	3
CS 540	Syntactic Anlys of Prgm Lang	3
CS 541	Topics in Complr Constrctn	3
CS 546	Parallel and Distributed Proc	3
CS 551	Operating Syst Design&Implemtn	3
CS 553	Cloud Computing	3
<b>Systems Core Courses</b>		(3)
Select a minimum of one course from the following:		3
CS 542	Computer Netwrks I:Fundamentals	3
CS 544	Computer Ntwrks II: Ntwrk Svc	3
CS 547	Wireless Networking	3
CS 550	Advanced Operating Systems	3
CS 555	Anlytc Mdls Simul Comp Syst	3
CS 570	Adv Computer Architecture	3
CS 586	Software Systems Arch	3
<b>Theory Core Courses</b>		(3)
Select a minimum of one course from the following:		3
CS 530	Theory of Computation	3
CS 533	Computational Geometry	3
CS 535	Dsgn and Anlys of Algorithms	3
CS 536	Science of Programming	3
CS 538	Combinatorial Optimization	3
CS 539	Game Theory: Algorithms & Apps	3
<b>Elective Courses</b>		(21)
Select 21 credit hours		21
<b>Total Credit Hours</b>		<b>30</b>

### Notes:

- All core and specialization courses must be satisfied by courses taken at Illinois Institute of Technology. Courses transferred for credit cannot be used to satisfy core or specialization course requirements. Core course credit does apply toward the 20-credit hour requirement for CS/CSP courses.

- Elective credit may include 400- and 500-level CS and CSP courses, certain courses transferred from other departments, and up to six credit hours of accelerated courses. Interprofessional Projects (IPROs) and deficiency courses (CS 201, CS 401, CS 402, and Calculus) cannot be included. Consult the computer science department website ([science.iit.edu/computer-science](http://science.iit.edu/computer-science)) for details.
- Certain specializations have program requirements different from those above. See the Specializations tab on this page for more details.

## Master of Computer Science with Specialization in Business

33 credit hours

This program is designed to help computer science professionals extend and deepen their technical and practical knowledge of the field while introducing themselves to core topics in modern business practices. Students must satisfy the general Master of Computer Science requirements, and complete 24 credit hours of CS/CSP courses and three specialization courses from the Stuart School of Business.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(9)
Select a minimum of three courses from the following:		9
BUS 510	Fundamentals of Innovative Bus	3
BUS 550	Business Statistics	3
MBA 501	Financial Statement Applicatio	3
MBA 502	International Trade	3
MBA 504	Analytics for Decision Making	3
MBA 506	Leadership and Organization De	3
MBA 509	Financial Management	3
MBA 511	Marketing Strategy	3
Total Credit Hours		9

Note: Stuart School of Business tuition and fees apply to these courses. Applicants to the program are not required to take the GMAT. Students who have already taken Stuart School of Business courses as part of a degree program cannot reuse those courses to satisfy specialization course requirements.

## Master of Computer Science with Specialization in Computational Intelligence

30 credit hours

This program is intended for students who are interested in ways in which computers may learn and adapt based on data so as to solve complex problems in various areas of computer science. Students must satisfy general Master of Computer Science requirements and complete four specialization courses.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(12)
Select a minimum of four courses from the following:		12
CS 480	Introduction to Artificial Int	3
CS 512	Computer Vision <sup>1</sup>	3
CS 522	Advanced Data Mining	3
CS 577	Deep Learning	3
CS 578	Interact/Trans Mach Learning	3
CS 579	Online Social Network Analysis	3
CS 583	Probabilistic Graphical Models	3
CS 584	Machine Learning	3
CS 585	Natural Language Processing	3
Total Credit Hours		12

<sup>1</sup> CS 512 serves simultaneously as a specialization and a Programming core course.

## Master of Computer Science with Specialization in Cyber-Physical Systems

30 credit hours

This program is intended for students who are interested in learning how to work with embedded controllers with integrated sensors and networking abilities and to utilize them for real-world applications. Students must satisfy general Master of Computer Science requirements and complete four specialization courses.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(12)
Select a minimum of four courses from the following:		12
CS 442	Mobile Application Development	3
CS 552	Distributed Real-Time Systems	3
CS 553	Cloud Computing <sup>1</sup>	3
CS 555	Anlytc Mdls Simul Comp Syst <sup>1</sup>	3
CS 556	Cyber-Physical Sys: Lang & Sys	3
CS 557	Cyber-Physical Sys Sec/Dsgn	3
CS 558	Advanced Computer Security	3
Total Credit Hours		12

<sup>1</sup> CS 553 serves simultaneously as a specialization course and a Programming core course. CS 555 serves simultaneously as a specialization course and a Systems core course.

## Master of Computer Science with Specialization in Data Analytics

30 credit hours

Intelligent analysis of large amounts of data is a crucial component in supporting business decisions. This program is intended for students interested in learning how to discover patterns in large amounts of data in information systems and how to use these to draw conclusions. Students must satisfy general Master of Computer Science requirements and complete four specialization courses.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(12)
Select a minimum of four courses from the following:		12
CS 422	Data Mining	3
CS 520	Data Integration Warehousing	3
CS 522	Advanced Data Mining	3
CS 554	Data-Intensive Computing	3
CS 579	Online Social Network Analysis	3
CS 583	Probabilistic Graphical Models	3
CS 584	Machine Learning	3
CS 585	Natural Language Processing	3
CSP 571	Data Preparation and Analysis	3
Total Credit Hours		12

## Master of Computer Science with Specialization in Database Systems

30 credit hours

This program is designed to provide in-depth knowledge of the principles of design and development of database systems. Students must satisfy general Master of Computer Science requirements and complete four specialization courses.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(12)
Select a minimum of four courses from the following:		12
CS 425	Database Organization	3
CS 520	Data Integration Warehousing	3
CS 521	Object-Oriented Analysis/Dsgn	3
CS 522	Advanced Data Mining	3
CS 525	Advanced Database Organization <sup>1</sup>	3
CS 529	Information Retrieval	3
CS 553	Cloud Computing <sup>1</sup>	3
CS 554	Data-Intensive Computing	3
Total Credit Hours		12

<sup>1</sup> CS 525 and CS 553 serve simultaneously as specialization courses and Programming core courses.

## Master of Computer Science with Specialization in Distributed and Cloud Computing

30 credit hours

The Master of Computer Science with a Specialization in Distributed and Cloud Computing is intended for students who are interested to learn about distributed systems and how they are applied to real world problems, as well as how emerging cloud computing technologies can be used to implement some of the world's most popular services and applications. Students must satisfy general Master of Computer Science requirements and complete four specialization courses.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(12)
Select a minimum of four courses from the following:		12
CS 451	Parallel/Distributed Computing	3
CS 546	Parallel and Distributed Proc <sup>1</sup>	3
CS 550	Advanced Operating Systems <sup>1</sup>	3
CS 552	Distributed Real-Time Systems	3
CS 553	Cloud Computing <sup>1</sup>	3
CS 554	Data-Intensive Computing	3
CS 570	Adv Computer Architecture <sup>1</sup>	3
Total Credit Hours		12

<sup>1</sup> CS 546 and CS 553 both serve simultaneously as specialization courses and Programming core courses. CS 550 and CS 570 both serve simultaneously as specialization courses and Systems core courses.

## Master of Computer Science with Specialization in Education

33 credit hours

The Master of Computer Science with a Specialization in Education is designed to enable computer science students to further their technical education while opening a career path toward teaching computer science.

Courses for the MCS/Education degree program are taken from the Department of Computer Science and the Department of Mathematics and Science Education (MSED). In addition to satisfying general Master of Computer Science degree requirements, students must complete 24 credit hours of CS/CSP courses and the following three MSED courses, which are the first three required courses for a teaching certificate.

Code	Title	Credit Hours
<b>MSED Required Courses</b>		(9)
MSED 300	Instrctnl Methods/Strategies I	3
MSED 500	Analysis of Classrooms II	3
MSED 554	Mid/Sec Lvl Science Curriculum	3
or MSED 555	Mid/Sec Lvl Math Curriculum	
Total Credit Hours		9

## Master of Computer Science with Specialization in Finance

33 credit hours

The Master of Computer Science with a Specialization in Finance is designed to enable computer science students to further their technical education while opening a path toward a career in finance.

Courses for the MCS/Finance degree program are taken from the Department of Computer Science and the Stuart School of Business. In addition to satisfying the general Master of Computer Science degree requirements, students must complete 24 credit hours of CS/CSP courses and three specified MSF courses.

Code	Title	Credit Hours
<b>Required Finance Courses</b>		(9)
MSF 504	Valuation/Portfolio Management	3
MSF 505	Futures/Option/OTC Derivatives	3
MSF 506	Financial Statement Analysis	3
Total Credit Hours		9

Note: Stuart School of Business tuition and fees apply to these courses. Applicants to the program are not required to take the GMAT. Students who have already taken Stuart School of Business courses as part of a degree program cannot reuse those courses to satisfy specialization course requirements.

## Master of Computer Science with Specialization in Information Security and Assurance

30 credit hours

Information security, privacy, and information assurance are of prime importance in modern computer systems where data can be accessed from nearly everywhere. The Master of Computer Science with a Specialization in Information Security and Assurance is intended for students interested in aspects of security and assurance in modern e-commerce applications. Students must satisfy general Master of Computer Science requirements and complete four specialization courses.

The U.S. government's Information Assurance Courseware Evaluation (IACE) program has certified the computer science department's courses as meeting the national training standards for Information Systems Security Professionals (NSTISSI 4011) and Systems Certifiers (NSTISSI 4015). These standards describe course content for studying telecommunications security and automated information systems security.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(12)
Select a minimum of four of the following courses:		12
CS 458	Intro to Information Security	3
CS 525	Advanced Database Organization <sup>1</sup>	3

CS 528	Data Privacy and Security	3
CS 549	Cryptography	3
CS 550	Advanced Operating Systems <sup>1</sup>	3
CS 558	Advanced Computer Security	3
CSP 544	System and Network Security	3

Total Credit Hours 12

<sup>1</sup> CS 525 serves simultaneously as a specialization course and a Programming core course. CS 550 serves simultaneously as a specialization course and a Systems core course.

## Master of Computer Science with Specialization in Networking and Communications

30 credit hours

This program is designed to provide an in-depth knowledge of the theory and practice of computer networking and telecommunications. Students must satisfy general Master of Computer Science requirements and complete four specialization courses.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(12)
Select a minimum of four courses from the following:		12
CS 455	Data Communication	3
CS 542	Computer Netwrks I:Fundamentals <sup>1</sup>	3
CS 544	Computer Ntwrks II: Ntwrk Svc <sup>1</sup>	3
CS 547	Wireless Networking <sup>1</sup>	3
CS 548	High-Speed Networks	3
CS 549	Cryptography	3
CS 555	Anlytc Mdls Simul Comp Syst <sup>1</sup>	3
CS 557	Cyber-Physical Sys Sec/Dsgn	3
Total Credit Hours		12

<sup>1</sup> CS 542, CS 544, CS 547, and CS 555 all serve simultaneously as specialization courses and Systems core courses.

## Master of Computer Science with Specialization in Software Engineering

30 credit hours

This program is designed to provide an in-depth knowledge of theory and practices in software engineering, including hands-on experience in software design, development, and maintenance. Students must satisfy general Master of Computer Science requirements and complete four specialization courses.

Code	Title	Credit Hours
<b>Specialization Courses</b>		(12)
Select a minimum of four courses from the following:		12
CS 487	Software Engineering	3
CS 521	Object-Oriented Analysis/Dsgn	3
CS 536	Science of Programming <sup>1</sup>	3
CS 537	Software Metric	3
CS 586	Software Systems Arch <sup>1</sup>	3
CS 587	Software Project Management	3
CS 589	Software Testing and Anlys	3
Total Credit Hours		12

<sup>1</sup> CS 536 serves simultaneously as a specialization course and a Theory core course. CS 586 serves simultaneously as a specialization course and a Systems core course.