

MASTER OF SCIENCE IN COMPUTER AND INFORMATION SYSTEMS

Molinaro 248 • 262-595-2314 • Keyword: *Computer Science*

Degree offered:

Master of Science.

Participating faculty from the Computer Science Department

Associate Professors:

Hansen, Ph.D.; Lincke, Ph.D.

Assistant Professors:

Riley, Ph.D.; Quevedo, Ph.D.

Participating faculty and staff from the Business Department

Professors:

Chalasanani, Ph.D.; Hawk, Ph.D.

Associate Professors:

Baldwin, Ph.D.; Zheng, Ph.D.

Goals of the M.S. in Computer and Information Systems Program

The Master of Science in Computer and Information Systems (MSCIS) Program is intended to increase the supply of high quality information technology professionals and to contribute to the professional advancement of employees in the information technology workforce. The degree program draws on the strengths of UW-Parkside's faculty and computing resources in both computer science (CS) and management information systems (MIS). Graduates of this program will have up-to-date information technology knowledge and skill, and practical experience with information systems development and deployment.

All MSCIS graduates will be able to:

- Participate in the justification, specification, design, development, and implementation of modern enterprise systems for an organization, including ERP systems and knowledge management systems.
- Design, develop, test, and implement software using industry leading practices.
- Develop a project plan and successfully lead a project team using the project plan.
- Design and implement organizational and IT control mechanisms that lead to a reliable and secure information system.

- Develop long range IT plans including strategic and personnel plans.
- Analyze a problem from a research/modeling perspective.

Requirements for the Master of Science in Computer Information Systems (30 credits)

To achieve the above goals, MSCIS students must complete prerequisite requirements (up to 20 credits that can be waived with undergraduate equivalent courses) and 30 credits distributed as follows: 6 credits in software development, 8 credits in information technology management, 3 credits in cyber-security, 2 credits in research/modeling methods, 9 credits in a specialization track, and 2 credits of free electives. Specialization tracks include: software development, information technology management, project management, research/modeling methods, and cyber-security. Tracks are being developed in Geographical Information Systems and bioinformatics. With approval from the MSCIS steering committee, students may also design their own specialization tracks. A thesis option is available for those students who would like to eventually pursue a doctoral degree. The requirements and the classes in each track are specified below:

1. Prerequisites (0-20 credits, depending on background):

Programming proficiency (requirement depends upon results of a placement exam).

CSCI 241 Computer Science I..... 4 cr
CSCI 242 Computer Science II..... 4 cr

Probability statistics (waived with a grade of C or better in an undergraduate or graduate equivalent course)

QM 210 or CSCI 309 3 cr

Database management (waived with a grade of C or better in an undergraduate or graduate equivalent course)

MIS 328 or CSCI 380..... 3 cr

Computer systems/data communications (waived with a grade of C or better in an undergraduate or graduate equivalent course)

MIS 327 or CSCI 477 or CSCI 370..... 3 cr

Accounting (waived with a grade of C or better in an undergraduate or graduate equivalent course)

ACCT 201 Financial Accounting 3 cr

2. Core requirements (19 credits). Students must complete the specified credits required in each track. A course cannot be used to satisfy the requirements in more than one category. The classes must be approved by the MSCIS adviser.

Software Development (min. 6 credits):

CIS 533	Programming Languages	3 cr
CIS 540	Data Structures and Algorithm Design ...	3 cr
CIS 570	Operating Systems.....	3 cr
CIS 605	Artificial Intelligence	3 cr
CIS 620	Computer Graphics.....	3 cr
CIS 621	Computer Vision.....	3 cr
CIS 622	Multimedia Systems	3 cr
CIS 640	Compiler Design & Implementation.....	3 cr
CIS 644	Event-Driven Programming	3 cr
CIS 675	Software Engineering – Design	3 cr
CIS 676	Software Engineering – Project Management	3 cr
CIS 677	Computer Communications & Networks	3 cr
CIS 680	Advanced Databases	3 cr
CIS 745	Web Programming	3 cr

A maximum of two 500-level courses will be accepted for the graduate degree. Information Technology Management (min. 6 credits). Note: The required 6 credits are specified. Changes to the required classes must be approved by MSCIS adviser.

CIS 721	Enterprise Systems	3 cr (required)
CIS 723	Management of Electronic Commerce...	2 cr
CIS 725	Information Systems Policy & Strategy	3 cr (required)
CIS 727	Business Process Redesign and Improvement	2 cr
MBA 515	Operations Management Foundations	2 cr
MBA 715	Advanced Operations Management ...	2 cr

Information Technology Project Management (min. 2 credits):

CIS 625	System Analysis & Design	3 cr
CIS 676	Software Engineering – Project Management	3 cr
MBA 716	Project Management	2 cr
MBA 744	Management Techniques	2 cr

Cyber-Security (min. 3 credits):

CIS 624	Advanced Business Data Communications	
OR		
CIS 677	Computer Communications & Networks	3 cr
CIS 645	Web Security.....	3 cr
CIS 678	Network Security.....	3 cr
CIS 679	Information Systems Security	3 cr
CIS 790	Special Topics in CIS (related to Cyber-Security).....	3 cr

Research and Modeling Methods (min. 2 credits):

MBA 712	Quantitative Methods	2 cr
CIS 795	Research Methods in CIS.....	3 cr
MBA 713	Decision Analysis.....	2 cr
CIS 781	Modeling and Optimization Methods ..	2 cr
MBA 790	Special Topics (related to research or modeling)	2 cr

- 3. Track requirement (9 credits). Students must select a track and complete 9 additional credits within the track beyond the minimum core requirements. Six credits of independent study related to a project or thesis may be used to satisfy the track requirement.**
- 4. Free elective (2 credits). A student must take an additional graduate level classes to complete 30 credit hours.**

Admission Requirements

To qualify for admission into the MSCIS program, an applicant must have:

1. A bachelor's degree from an accredited institution with an undergraduate GPA (UGPA) of at least 3.0 on a 4.0 scale
2. Submission of GMAT (Graduate Management Admission Test) or GRE (Graduate Record Examination) exam scores. The GMAT score + 200 times the UGPA must exceed 1000, or the sum of the GRE quantitative and verbal scores must exceed 1100 and the analytical writing score must be 4 or higher.
3. Submission of a letter of application outlining professional goals.
4. Receipt of two letters of recommendation indicating promise for success in graduate studies.
5. International students whose native language is not English are required to provide evidence of English language competence, normally by presenting a satisfactory score on the TOEFL exam.

At the discretion of the program faculty, students with minor deficiencies in items 1 and 2 may be conditionally accepted into the MSCIS program if they can otherwise demonstrate significant potential for success.

Application Procedure

Application materials may be obtained from the Computer Science Department office:

MSCIS Program
 Computer Science Department
 University of Wisconsin-Parkside
 900 Wood Road
 P.O. Box 2000
 Kenosha WI 53141-2000

An application is complete when all of the following materials have been received:

1. A completed application form, along with the application fee payment.
2. GRE or GMAT scores and official transcripts of all undergraduate and graduate work sent directly to the Computer Science Department office.
3. Letter of application.
4. Two letters of recommendation sent directly to the Computer Science Department office.
5. International students must also submit a sponsorship form, a transcript evaluation, and evidence of English proficiency.
6. Additional materials in support of the applicant, as appropriate.

Contact the Computer Science Department office for information about application deadlines.

Course Restrictions

Students must maintain a GPA of 3.0 in all course work required for the MSCIS degree to continue in the degree program.

Disruption of Studies

Students are expected to complete MSCIS degree requirements in two to three years, depending on preparation. An MSCIS degree candidate who fails to complete the degree within five years after admission will be dropped from the program. A degree candidate who does not enroll in an MSCIS course within a period of 12 months must apply for readmission.

Transfer Students

Students may transfer up to 12 credits of graduate work taken at another institution, subject to equivalence with MSCIS courses. Only courses with a grade of B (3.0 on a 4.0 scale) or better will be accepted. Transfer courses are not counted toward the UW-Parkside GPA requirement of 3.0 in MSCIS course work.

Graduate Courses (CIS)

533 Programming Languages 3 cr

Prereq: CSCI 242 and consent of instructor. Freq: Spring.
Introduction to the syntax and semantic issues in programming languages and their effect on language implementation. This includes methods to specify languages, data storage, and the sequence of control in programs. Non-procedural languages, including functional and logic languages, will be examined. Not open to those with credit in CSCI 333.

540 Data Structures and Algorithm Design 3 cr

Prereq: B or better in CSCI 242 or consent of instructor. Freq: Spring.
Study of the design, implementation and analysis of computer algorithms; time and space requirements for sorting, searching, graph theory, mathematics and string processing algorithms. Not open to those with credit in CSCI 340.

570 Operating Systems 3 cr

Prereq: C or better in CSCI 242. Freq: Fall.
Operating system concepts, process definition and implementation, deadlock, memory management and protection, distributed system architecture, and case studies. Not open to those with credit in CSCI 370.

605 Artificial Intelligence 3 cr

Prereq: CSCI 333 or CIS 533 or consent of instructor. Freq: Occasionally.
Introduction to Artificial Intelligence (AI) techniques that include search, game playing, and knowledge representation. Specific sub-disciplines of AI including natural language processing and neural networks. Programming assignments in both Prolog and LISP. Not open to those with credit in CSCI 405.

609 Human-Computer Interfaces 3 cr

Prereq: Consent of instructor. Freq: Occasionally.
A survey of the field of human-computer interaction including the user interface development process, human memory, perception, and motor abilities as they relate to user interface design. Qualitative overview of descriptive and inferential statistics. Students design a low-tech prototype of a user interface (user and task analysis, design and evaluation). Not open to those with credit in CSCI 409.

620 Computer Graphics 3 cr

Prereq: CS 340 or CIS 540 or consent of instructor. Freq: Occasionally.
Graphics hardware and software, techniques for representation and visualization, two- and three-dimensional transformations, concepts and techniques of visual realism. Not open to those with credit in CSCI 420.

621 Computer Vision 3 cr

Prereq: CSCI 340 or 333 or CIS 540 or 533. Freq: Occasionally.
Review of algebra of matrices and partial differentiation. Introduction to Machine Vision and Image Processing including image formation, thresholding, image filtering, edge detection, image segmentation, image data compression, image similarity and some dynamic vision. Not open to those with credit in CSCI 421.

622 Multimedia Systems 3 cr

Prereq: Consent of instructor. Freq: Occasionally.
Principles and design of multimedia systems; implementation of multimedia algorithms; current multimedia technologies. Not open to those with credit in CSCI 422.

624 Advanced Business Data Communications 3 cr

Prereq: MIS 327 or CSCI 477. Freq: Fall.
Fundamentals of transmission protocols and network services. Setting up and configuring network protocols, routing, security, and networking services such as name resolution and dynamic addressing. Lab exercises and case studies. Not open to those with credit in MIS 424. This course may be offered online.

625 System Analysis and Design 3 cr

Prereq: MIS 328 or CSCI 380. Freq: Spring.
System development using the life cycle, rapid application development, prototyping, software acquisition, structured and object-oriented techniques and project management. Not open to those with credit in MIS 425 or CSCI 475. This course may be offered online.

640 Compiler Design and Implementation 3 cr

Prereq: CSCI 333 or CIS 533. Freq: Occasionally.
Theory, design and implementation of compilers and other syntax-directed systems. Applies techniques of finite state machines, lexical analysis, symbol tables, parsing, storage allocation and code generation to the development of a compiler. Laboratory work included. Not open to those with credit in CSCI 440.

- 641 Advanced Project Management Tools and Techniques 3 cr**
Prereq: PMGT 341 or MBA 716 or CIS 676. Freq: Yearly.
 Covers advanced tools and technologies of project management, including Microsoft Project, Microsoft Excel, Work Breakdown Structure (WBS), budgeting a project, scheduling a project using PERT/CPM, allocating scarce resources, critical chain and critical path, resource leveling, monitoring the project costs, evaluating and terminating a project. Not open to those with credit in PMGT 441.
- 642 Project Management Simulation..... 3 cr**
Prereq: PMGT 341 or MBA 716 or CIS 676. Freq: Yearly.
 Topics include project scheduling, risk analysis, earned value and teamwork. Students apply project management skills to a simulated or live project, develop project justification and project plan, and execute the project plan and track performance. Not open to those with credit in PMGT 442.
- 644 Event-Driven Programming 3 cr**
Prereq: CS 370 or CIS 570 or consent of instructor. Freq: Occasionally.
 Origins of events; the event-driven programming model; interrupt processing as event handling; client-server architectures; windowing environments and GUI programming; development support software; and case studies. Project work included. Not open to those with credit in CSCI 444.
- 645 Web Security 3 cr**
Prereq: CSCI 242 or consent of instructor. Freq: Occasionally.
 Vulnerabilities of web languages, interfaces, servers and databases. Identifying and avoiding vulnerabilities with shopping carts, HTTP/HTTPS and the URL. Detecting and preventing hacking techniques such as cyber graffiti, e-shoplifting, impersonation, buffer overflows and cross-site scripting. Not open to those with credit in CSCI 445.
- 675 Software Engineering-Design 3 cr**
Prereq: B or better in CSCI 242 or consent of instructor. Freq: Fall.
 An introduction to UML design and teamwork in the development of a larger software system. The use of UML use case, activity, class/object, interaction, and state diagrams in the creation of efficient designs and systems. Not open to those with credit in CSCI 475.
- 676 Software Engineering-Project Management 3 cr**
Prereq: CIS 625 or 675. Freq: Spring.
 Software development from an engineering perspective including software development models, team organization and management, implementation strategies, software testing and verification, and project cost estimation. Students will demonstrate their mastery of software engineering design and development strategies through implementation of a significant team-based project. Not open to those with credit in CSCI 476.
- 677 Computer Communications and Networks..... 3 cr**
Prereq: B or better in CSCI 242 or CSCI 570 or consent of instructor. Freq: Occasionally.
 Transmission protocols, layered network protocols, network topology, message routing, performance analysis, security, and case studies. Not open to those with credit in CSCI 477.
- 678 Network Security 3 cr**
Prereq: MIS 327 or CSCI 370 or 375. Freq: Occasionally.
 Computer and network security related to operating systems, networks and system administration issues; hacking, incident response, firewalls, VPNs, intrusion detection, and auditing. Not open to those with credit in CSCI 478.
- 679 Information Systems Security..... 3 cr**
Prereq: Consent of instructor.
 Introduction to information systems security; considers technical, administrative, and physical aspects of IT security; topics include fraud, risk, information protection, business continuity, network security, auditing, and security planning and governance. Not open to those with credit in CSCI 479.
- 680 Advanced Databases 3 cr**
Prereq: MIS 328 or CSCI 380. Freq: Occasionally.
 Review of relational database languages such as SQL and Relational Algebra, query optimization techniques. Non-relational database models including object-oriented databases, XML databases, deductive databases. Data mining, transaction management, concurrency control, text retrieval, Web data management. Not open to those with credit in CSCI 480.
- 721 Enterprise Systems..... 3 cr**
Prereq: Consent of instructor. Freq: Fall.
 Explores common enterprise systems that are used across organizations including enterprise resource planning systems, customer relationship management systems, and knowledge management. Include technical architecture of integrated systems and relationships to the organization's business processes.
- 723 Management of Electronic Commerce..... 2 cr**
Prereq: Consent of instructor. Freq: Occasionally.
 Electronic commerce (e-commerce) technology, developing an e-commerce architecture, business-to-consumer and business-to-business e-commerce, e-commerce planning, and social implications.
- 727 Business Process Redesign and Improvement 2 cr**
Prereq: Consent of instructor. Freq: Occasionally.
 Cost reduction, service improvements, supply chain management, and time-to-product speedups through information technology; business process improvement (BPI) methodologies; analysis, modeling, and redesign of a system. Case studies and projects included.
- 725 Information Systems Policy and Strategy 3 cr**
Prereq: Consent of instructor. Freq: Fall.
 The management of Information Technology (IT) and Information Systems (IS) from the perspective of upper management, covering IT strategic planning, IS organizational structures, human resource planning, and control structures. Cases, executive presentations, and project work included.
- 745 Web Programming 3 cr**
Prereq: MIS 328 or CSCI 480. Freq: Spring.
 Essentials of developing and deploying robust applications for the World Wide Web, including client-side markup languages and scripting, applets, client/server communication, server-side applications, database connectivity, distributed components, and multi-tiered architectures.
- 781 Modeling and Optimization Methods 3 cr**
Prereq: Graduate standing. Freq: Occasionally.
 Introduction to simulation, optimization and other types of models used to support organizational decisions. Multiple languages, tools, and techniques are explored.
- 790 Special Topics in CIS..... 3 cr**
Prereq: Consent of instructor. Freq: Spring.
 In-depth study of new and/or special-interest subject areas within the discipline. Subject selection will vary from offering to offering.
- 793 Internship in Computer Information Systems1-2 cr**
Prereq: Consent of instructor. Freq: Fall, Spring, Summer.
 Participation in the technical activities of an ongoing organization under the joint guidance and supervision of a member of the organization and a member of the faculty. Grading will be on a credit/no-credit basis. A student may register and receive credit in this course for a maximum of 6 credits.
- 795 Research Methods in CIS 3 cr**
Prereq: A minimum of 6 credits in CIS courses. Freq: Occasionally.
 Explores research methods used in the computer and information systems discipline including quantitative and qualitative methods. Reviews current research in CIS.

796 CIS Project..... 1 cr

Prereq: Consent of instructor. Freq: Occasionally.

Completion of a CIS project in conjunction with another 600- or 700-level CIS course; includes project documentation and oral and written reports.

797 CIS Thesis.....1-4 cr

Prereq: Consent of instructor. Freq: Fall, Spring, Summer.

Student conducts research under the direction of a faculty member and produces a master's level thesis in a CIS subject. For students ultimately interested in pursuing doctoral studies.

799 Independent Study.....1-4 cr

Prereq: Consent of instructor. Freq: Fall, Spring.

Independent work on a specific problem in CIS under the supervision of faculty.