

GRADUATE DIRECTOR**Joan E. Hoopes, Ph.D.****(845) 575-3000, ext. 2614 or 2610****joan.hoopes@marist.edu****MISSION AND OBJECTIVES**

The Master of Science in Computer Science/Information Systems (IS program) offers excitement and challenges for the information age. It provides advanced expertise and experience in both computer science and business administration. This program focuses on applying information technology to improve the performance of people in organizations. It is especially appropriate for persons who wish to become the organizational change agents, innovators, and thought leaders of the future.

The advanced education and expertise provided in this program prepare the graduate student to identify, analyze, and solve business problems using the systems approach. This approach includes defining the problem, gathering data to describe the problem, identifying alternatives to solve the problem, evaluating the alternatives, selecting the best alternative, and implementing a solution with appropriate follow-up. This is done using both case studies and real clients.

The primary areas of study include information systems technology, systems concepts and processes, and organization functions and management (including interpersonal and organizational behavior). The program places strong emphasis on both the technological and sociological aspects of systems. Students are frequently expected to participate in team situations to enhance both their systems thinking and their interpersonal skills. Multiple courses are real-client based in order to enhance the student's consultative skills and experience.

Specific areas of emphasis include eliciting client requirements, analyzing, planning, designing, developing, and implementing information systems applications, and managing information systems development and operation. Appropriate behavioral, organizational, and financial knowledge and skill development support the technological central theme.

The IS program is designed to prepare individuals for a working career in industry, government, or education. Specific career paths for the graduating professional include systems analyst and/or designer, business analyst, information systems project manager, data administrator, data processing auditor, information systems manager, consultant, or educator.

For those already employed in related disciplines, the IS program provides the advanced professional courses necessary to enhance career development opportunities.

In essence, by studying and practicing systems thinking, mental modeling, shared vision building, and team learning, the graduate of this program is well prepared to help develop and sustain what MIT's Peter M. Senge calls the "learning organizations" of the future.

Two specializations are offered. One is the foundation for a career position of Chief Information Officer (CIO). The second is the foundation for a career position of Chief Technology Officer (CTO).

EFFECTIVE COMMUNICATION SKILLS

As an information systems graduate student, you should be aware that effective communication is a critical skill required of every student. In order to further develop and nurture a student's oral and written communication skills, the Marist pedagogy includes the following as critical success factors for students in information systems:

- dialogue, not lecture, is the primary teaching method used. Most of the courses in this program will require you to verbally interact with the instructor and/or your peers on a regular basis in class or online.
- participation in small group or team situations. These are designed to help develop your systems thinking and to enhance your interpersonal skills both in and out of the classroom.
- oral presentations to your instructor, your class, or to a real client. These may be formal or informal presentations and will summarize your own work or that of some team of which you are a member.
- written reports or research papers which will help evaluate the effectiveness of your written communication skills and provide feedback for improving them.

The above demands and/or standards are applied universally to all students in the information systems program.

ADMISSIONS REQUIREMENTS

In addition to the application materials addressed in the Admissions to Graduate Programs section of the General Information section of this catalog, applicants to the graduate program in Information Systems must submit the following:

- a current résumé.
- a written summary of technical or professional non-credit course training.
- a written statement which outlines the applicant's career objective(s), the reason(s) for selecting Marist's IS program, desired specialization, and the applicant's personal and professional expectations from the program.
- Optionally, at the graduate director's discretion, two letters of recommendation may be required.

Admissions requirements for international students are outlined in the Application Requirement for International Students in the General Information section of this catalog.

PREREQUISITES

Applicants to the Information Management Specialization are expected to have completed undergraduate-level course work in introductory statistics.

Applicants to the Information Technology Specialization are expected to possess a reasonable proficiency in computer programming and mathematics since knowledge and skill in these areas will be used throughout this specialization.

Proficiency in computer programming can be satisfied with a B or better grade in the Marist graduate course MSCS 500 – Fundamentals of Object-Oriented Programming. The graduate course MSCS 517 – Program, Data & File Structures is taught using the language from MSCS 500. Proficiency in mathematics can be satisfied by the completion of undergraduate-level courses in introductory statistics or their equivalent.

TRANSFER CREDIT

A student may transfer up to six graduate credits from a regionally accredited graduate program. Only courses with grades of B or better will be accepted. Courses should be equivalent in content and credit value to courses offered in the Marist program. The graduate director of the IS program will determine the status of all transfer requests at the time of the application that includes previous graduate study.

DEGREE REQUIREMENTS

To qualify for the Master of Science degree in Information Systems, a student must normally complete 36 hours of work at the graduate level (excluding any prerequisites). Course waivers may reduce this to as few as 30 credit hours.

As a rule, each student is expected to complete the IS degree as outlined at the time of admission to Marist College. Therefore, under normal circumstances transfer credit or waiver requests for graduate work taken elsewhere after admission to this program will not be granted. Such substitutions will only be considered for a substantive reason, such as relocation.

Upon acceptance into the program, graduate students receive a list of prescribed courses to be successfully completed. Specific undergraduate or graduate course work may be recommended to satisfy prerequisite requirements or remedy deficiencies as identified by the graduate director. IS degree requirements must be completed within nine years of acceptance into the program with a cumulative index of 3.0 or higher. Requests for an extension of the nine-year limitation must be made in writing to the graduate director.

Part-time students are normally limited to registering for one graduate course during their first semester, unless special arrangements are approved in advance by the graduate director. Full-time study is defined as a semester load of at least nine graduate credits.

COURSE WAIVERS

If a student's prior academic work of a relatively recent nature in a specific subject area is judged to be equivalent in intensity and rigor to Marist courses, including both the theoretical and practical dimensions of subject matter involved, then the

student may be granted a course waiver for that subject. Since the student has already demonstrated an academic mastery of the pertinent subject matter, the specific course will be removed from the student's program requirements. No more than 2 course waivers (6 credits) may be granted.

Prior professional experience in a given subject area is not considered in granting course waivers at the graduate level. It may be used only to demonstrate subject matter competency for academic work taken more than five years earlier.

ADVISEMENT

The IS graduate director serves as the primary advisor to all students in the program. The graduate director regularly makes specific recommendations on course sequences to be followed by individual students, and approves all program planning requests made by students. Students should feel free to discuss any questions or concerns that they may have regarding their planned studies with the graduate director.

COURSE SCHEDULING

All courses leading to the IS degree are offered in the late afternoon and evening. Since this limits the number of available times for classes, full-time students may occasionally encounter scheduling problems. The graduate director will attempt in good faith to resolve such problems whenever they occur. Students are responsible for taking courses in the scheduled semesters.

For part-time students, it is recommended that two courses per semester be established as the normal objective. Benefits to the student are that initial personal motivation is better sustained, program completion occurs more quickly, odds on finishing are greatly increased, and the rewards of the effort are gained much sooner.

The graduate director reserves the right to limit the number of courses that a student may take each semester depending upon a student's professional workload and other concerns.

CAPSTONE ACTIVITY

The Information Systems Policy Course (MSCS 730) is used to demonstrate a satisfactory level of competence in writing, speaking, and research in the information systems discipline. Because the policy course is a capping course, it is expected that all other required courses will have been completed before the student enters this course. This will maximize the student's experience in the course while minimizing peer knowledge differences. Students must notify the graduate director in writing at least two semesters before they plan to take the capping course.

COURSE PLANNING

The semester in which courses are expected to be offered applies to the Marist College main campus only. Courses listed for a particular summer are expected to be offered every other summer. The IS Graduate Office should be contacted each

semester to determine the list of additional courses to be offered at extension sites during the following semester.

The college reserves the right to cancel a course due to insufficient enrollment, and to add additional courses as per student demand and instructor availability.

ACADEMIC STANDING

All students must maintain a 3.0 or higher cumulative average. Those below this average must repeat courses, starting with the courses in which the lowest grades were received, until a 3.0 or higher GPA is achieved. If a failing grade is received in a course, that course must be repeated at the next scheduled offering. All students requesting enrollment in the capping course must have a 3.0 or higher cumulative index. If, upon completion of the capstone course, the cumulative average falls below 3.0, then the capstone course(s) affecting the average must be taken again.

Students who fall below a 3.0 cumulative average during a particular semester will be warned and placed on academic probation. The student will be given up to two semesters (at the IS graduate director's discretion) to recover an average of 3.0 or higher. Should the student fail to do so, the student will be automatically dismissed from the program.

COURSE SCHEDULING CONSIDERATIONS

The IS program will commence a mixture of graduate courses both online and in the classroom, on a regular basis, beginning in the fall of 2003. Specific schedules will be addressed by the graduate director as needs mandate.

IS PROGRAM OVERVIEW:

The IS graduate program offers two specializations. Each specialization will consist of six required common IS core courses and three required specialization-specific courses. One specialization is the Information Management Specialization (IMS), which has a business application focus. The other specialization, Information Technology Specialization (ITS), has an Information Technology focus.

NOTE: It is strongly recommended that full-time graduate students work closely with the graduate director in order to accommodate any changes in scheduling that may become necessary.

SUBSTITUTE COURSES

In certain cases, the graduate director may include one or more substitute courses in a student's program. When this occurs, these substitute courses will become part of the degree requirements in place of the standard courses.

MASTER OF SCIENCE IN COMPUTER SCIENCE/INFORMATION SYSTEMS COURSE REQUIREMENTS:

MSCS Core Required Courses (18 Credits)

MSCS 527	Systems & Information Concepts in Organizations	3 credits
MSCS 537	Data Management I	3 credits
MSCS 567	Data Communications	3 credits
MSCS 647	Information Analysis	3 credits
MSCS 657	Systems Design	3 credits
MSCS 730	Information Systems Policy	3 credits

IMS Required Courses (9 credits)

MBA 525	Marketing Foundations	3 credits
MBA 555	Management Foundations	3 credits
MBA 575	Finance Foundations	3 credits

ITS Required Courses (9 credits)

MSCS 500	Fundamentals of Object-Oriented Programming	3 credits
MSCS 507	Computer Concepts & Software Systems	3 credits
MSCS 517	Program, Data & File Structures	3 credits

Electives

	3 credits from: Information Systems, Business, Software Development, or Psychology	
MSCS 547	Data Management II	3 credits
MSCS 557	Data Quality in Information Systems	3 credits
MSCS 637	Decision Support Systems	3 credits
MSCS 720	Information Systems Project	3 credits
MBA 501	Legal Environment of Business	3 credits
MBA 515	Economic Foundations	3 credits
MBA 545	Accounting Foundations	3 credits
MBA 610	Global Environment of Business	3 credits
PSYG 545	Psychology of Communication	3 credits
Special Topics	TBA	

It is strongly advised that the graduate director be consulted in the choice of these elective courses in order to help tailor the program to the student's specific needs.

Each student must consult with the IS graduate director to plan a course schedule to enable the student to complete the IS program in the most efficient time frame considering student desire, transfer credits or waivers, prerequisites, and possible scheduling information.

Graduate Courses in Information Systems

MSCS 500 (ITS)

Fundamentals of Object-Oriented Programming

3 Credits

The purpose of this course is to introduce the student to programming in an object-oriented programming environment. The student will study the object-oriented programming paradigm and develop programs using an object-oriented programming language. Abstraction, encapsulation, inheritance, and polymorphism will be covered. Students will also be introduced to the concept of an abstract data type (such as a stack or queue) and their implementations. Programming projects will be assigned throughout the semester.

Prerequisite: Graduate standing in either the Information Systems or the Software Development program. No previous programming experience is required. Fall semester

MSCS 507 (ITS)

Computer Concepts and Software Systems

3 Credits

An introduction to the functional organization of computer systems including both hardware and software components. The role of operating systems in directing and controlling the different systems resources is examined in detail. Computer terminology, physical computer implementations, and the operating environment for application programs are discussed. Fall and Spring semesters

MSCS 517 (ITS)

Program, Data and File Structures

3 Credits

An examination of the logical and physical structure of programs and data. Emphasis is on discipline in program design (including object-oriented programming), data organization and manipulation, algorithmic analysis, and the basic aspects of string processing, recursion, simple data structures, and object-oriented considerations. A project is developed during the semester.

Prerequisite: MSCS 500 Fundamentals of Object-Oriented Programming (C++) OR its equivalent. Spring semester

MSCS 527 (Core)

Systems and Information Concepts in Organizations

3 Credits

An identification and basic exploration of the systems point of view, the organization of a system, information flows, and the nature of information systems in organizations. The relation between systems and information to organizational objectives is examined. Functional information systems are explored including marketing, manufacturing, and finance. The distinction is made between management information systems and decision support systems. Team exercises and multiple case problems are used.

Prerequisite: Graduate IS standing. Fall and Spring semesters

MSCS 537 (Core)

Data Management I

3 Credits

A study of the critical issues related to managing data in organizations. The concept of data as a resource, the data environment, the database approach, and the need for data modeling are examined in detail. The growing use of database management systems in managing data is discussed. The data administration function, its relevance in evolving organizations, and emerging issues are also addressed.

Prerequisite: MSCS 527 Systems and Information Concepts in Organizations. Fall and Spring semesters. (Spring semester recommended.)

MSCS 547 (Elective)

Data Management II

3 Credits

Data Management II extends the theory and practice of Data Management I.

Offered at least every other year.

MSCS 557 (Elective)**Data Quality in Information Systems***3 Credits*

This course will help the students explore and understand data and information quality (DQ and IQ) problems in information systems, databases, and data warehouses. The student will be able to recognize and use DQ and IQ concepts in information systems projects: e.g., recognize patterns of data and design deficiencies in systems; suggest appropriate DQ and IQ improvement plans in light of known deficiencies; perform information quality assessments of organizations; apply data cleansing techniques to data warehouses, and experience the influence of data quality indicators on decision making. A combination of state-of-the-art literature and hands-on projects will be studied. Offered at least every other year.

MSCS 567 (Core)**Data Communications***3 Credits*

This course examines the concepts and mechanisms of data transport systems including information in the form of data, voice, and image. Network architecture, terminology, control, and general topologies are discussed. Current equipment and physical interconnection are explored in an applied model incorporating a range of network services to support application development, distributed processing, information centers, and distance learning. Emphasis is placed on the impact of data communications technology on organizations and on the design of future information systems.

Prerequisite: MSCS 527 Systems and Information Concepts in Organizations. Fall and Spring semesters

MSCS 637 (Elective)**Decision Support Systems***3 Credits*

A study of support systems for decision making in complex, technologically rich environments. The focus is on decision theory principles, problem identification, model formulation, and solution procedures. The distinction between decision support sys-

tems and transactional modes of processing information is examined. Sample quantitative and qualitative tools will be employed to study the behavioral aspects of decision making in a decision support environment. At least one expert system will be examined or developed. Neural networks are discussed.

Prerequisite: MSCS 647 Information Analysis. Fall semester. Offered at least every other year.

MSCS 647 (Core)**Information Analysis***3 Credits*

An examination of the strategies for developing information systems including a study of the systems development life cycle for managing application development. Group dynamics and individual behavior in the development process are explored. Techniques for eliciting information requirements, methods for analyzing requirements, and the development of a general logical design are examined and employed in a major team exercise using real clients.

Prerequisites: MSCS 527 Systems and Information Concepts in Organizations; MSCS 537 Data Management. Fall and Spring semesters

MSCS 657 (Core)**Systems Design***3 Credits*

A rigorous study of the development of an information system including specification, design, implementation, and testing. Both managerial and technological aspects of systems design and implementation are considered. The process of planning for change, audits, and post-implementation reviews are considered. Emphasis is on a total systems solution rather than software alone. Team projects help the student acquire the knowledge and skills required to develop a physical design and implement an operational system from a logical design.

Prerequisite: MSCS 647 Information Analysis. Fall and Spring semesters

MSCS 693, 694, 695

Graduate Internship in Information Systems

(One, two, and three credits respectively)

The graduate internship will provide advanced professional experience in the field of information systems. This course enables students to integrate the elements of their formal preparation and to apply theoretical concepts to real-world information systems. Graduate internships cannot be used to meet any elective requirement.

Prerequisites: Completion of 12 graduate credits and 3.0 GPA. Offered Fall, Spring, and Summer semesters. Arrangements made through the program director.

MSCS 720 (Elective)

Information Systems Project

3 Credits

Through the use of projects, this course fits together all of the concepts from previous courses regarding information systems development. The student gains experience in analyzing, designing, implementing, and evaluating information systems. Assignments consist of at least one systems development project involving all or part of the systems development cycle.

Students will work independently or in teams to acquire practical experience through such projects, including the behavioral considerations in systems development. The instructor(s) will act as evaluator(s) instead of teacher(s) since the course pragmatically tests the student's knowledge and skills gained previously in the program.

The student's ability to apply the systems approach to the project as a whole and to individual components will be very closely evaluated. The student's ability to be spontaneous and dynamic in acquiring ancillary knowledge and skills, which may be required to execute the development process, will also be closely observed and evaluated.

Prerequisites: Completion of MSCS 537, MSCS 567, MSCS 647, and MSCS 657

Offered at least every other year.

CAPSTONE COURSE

MSCS 730 (Core)

Information Systems Policy

3 Credits

This course builds on previous courses in the IS program and is integrative in nature. It provides closure on the multitude of diverse subjects found in the program.

Taught in seminar style, the critical thinking of students related to current and strategic issues in information management is thoroughly examined. The executive perspective is demanded, thus forcing all students to analyze, synthesize, and respond at the highest organizational level. Entrepreneurial views are valued and encouraged.

Emphasis is placed on the overall information needs of an organization and what role information systems play in meeting those needs. Students explore critical issues relating to managing and administering the information systems function.

Alternative structures for matching an information systems department to the structure and behavior of an organization are examined. The information center, decision-support center, end-user computing, and other concepts emerging from the evolution of information technology are discussed.

A major research paper based on a thorough literature search of primary sources in information systems and related fields is required of each student. Students are required to present their research papers at a Marist-sponsored conference that is open to the public.

Prerequisites: Completion of MSCS 537, MSCS 567, MSCS 647, and MSCS 657. Enrollment is limited. Those students closed out of one semester are assured entry for the next offered class. Spring semester or as needs otherwise dictate. Advance written notice is required two semesters before the course is to be taken.

Advanced Certificate in Information Systems

The 18-credit Advanced Certificate in Information Systems is designed to satisfy the professional needs of students who wish to acquire graduate-level knowledge in Information Systems (IS), but who do not wish to pursue a full graduate degree. It is offered for students who already possess a Master of Business Administration, a Master of Public Administration, or some other Master's degree program that contains or has been supplemented by a significant management-related component. The certificate program allows individuals who generally have little or no formal education in IS to develop an expanded graduate-level background in IS as an adjunct to their prior degree. Candidates who have taken an IS concentration at the graduate level at Marist are ineligible for this certificate.

Because the courses required demand considerable time and effort, only one course is permitted in the first semester (this requirement may be waived by the graduate director based upon recent prior academic performance). Students generally carry two to four courses per calendar year and take two years to complete the certificate. The maximum time permitted for completion is four years from admission into the program.

All courses taken in the certificate program are graduate IS courses and may be later applied to the IS graduate degree program provided the grades earned are B or better. However, because of the more comprehensive nature of the IS master's program, admission requirements are more rigorous and additional technical competency may be gained through taking some prerequisite courses. Specific requirements would be identified when admission to the IS master's program is requested.

CERTIFICATE REQUIREMENTS

The Graduate Certificate in Information Systems is obtained upon satisfactory completion of six courses (18 credits) from the graduate Information Systems program as follows:

MSCS 527	Systems & Information Concepts in Organizations	3 credits
MSCS 537	Data Management 1	3 credits
MSCS 567	Data Communications	3 credits
MSCS 647	Information Analysis	3 credits
MSCS 657	Systems Design	3 credits
MSCS 720	Information Systems Project	3 credits

ADMISSION REQUIREMENTS

Admission is based on prior academic performance and potential, a commitment to professional development, and demonstrated professional/leadership growth, as determined from the various documents submitted.

In addition to the application materials listed on page 11, applicants to the graduate certificate program in Information Systems must provide evidence of a significant business-related component in the baccalaureate or the master's degree along with:

- a current résumé and written summary of technical or professional non-credit course education if applicable;
- optionally, at the graduate director's discretion, two letters of reference may be required.
- a written statement summarizing career objectives(s), the reason(s) for selecting the IS certificate program, and personal and professional expectations from the program.

Students admitted on a non-matriculated basis are permitted to take three credits of course work. Upon completion of three credits, they will receive matriculated status if they have achieved at least a 3.0 GPA. All other prerequisites for matriculation must be met prior to receiving matriculated status. A cumulative 3.0 GPA is required to obtain the certificate.

Computer Science/Software Development and Information Systems Faculty

HAROLD ANDERSON Associate Professor of Computer Science, 2000. *Degrees:* B.S., University of Rhode Island; M.S., Trinity College; Ph.D., Syracuse University

JOSE ARREOLA Assistant Professor of Computer Science, 2000. *Degrees:* B.S., Universidad Nacional Autónoma de México; M.S., Pennsylvania State University; Ph.D., University of Pittsburgh

RONALD COLEMAN Assistant Professor of Computer Science and Information Technology, 2002. *Degrees:* B.S., City College of New York; Ph.D., Polytechnic University

CRAIG FISHER Associate Professor of Information Systems, 1989. *Degrees:* B.S., State University of New York at Oswego; M.A., Ball State University, Indiana; Ph.D., State University of New York at Albany. *Specialties:* Data Quality; Problem Solving & Programming; Systems Analysis & Design; Database Management

JAN HARRINGTON Assistant Professor of Information Systems, 1989. *Degrees:* B.S., University of Washington; M.L., University of Washington; Ph.D., Drexel University. *Specialties:* Systems Architecture; Object-Oriented Software Development; Network Security; Technology and Society

HELEN HAYES Assistant Professor of Mathematics and Computer Science, 1983. *Degrees:* B.A., College of St. Elizabeth; M.S., Fordham University; M.S.C.S., Syracuse University; *Specialties:* Formal Languages; Computability; Algorithms; Neural Networks

JOAN E. HOOPES Graduate Director of Information Systems, 1990. *Degrees:* B.S., M.B.A., Ph.D., Binghamton University. *Specialties:* Systems Analysis & Design; End User Computing; Assessment; Project Management

EITEL J. M. LAURIA Visiting Assistant Professor of Information Systems, 2002. *Degrees:* Electrical Engineering, Universidad de Buenos Aires (Argentina), Universidad de Deusto (Spain); Ph.D., State University of New York at Albany (in progress). *Specialties:* Database Management; OLAP; Data Mining; Bayesian Belief Networks; Software Development

DANIEL MARCELLUS Associate Professor of Computer Science, 2000. *Degrees:* B.A., Cornell University; Ph.D., Harvard University. *Specialties:* Linux; Artificial Intelligence

ANNE BERINATO MATHEUS Lecturer of Information Systems and Director of Computer Literacy, 2001. *Degrees:* B.A., Marist College; M.A., Marist College; M.S.C.S., Marist College. *Specialties:* Information Decision Systems; Organizational Studies

JEROME A. MCBRIDE Associate Professor of Information Systems, 1983. *Degrees:* B.S., Manhattan College; M.S., Purdue University. *Specialties:* Information Systems in Organizations; Organizational Skills; Decision-Support Systems; Systems Analysis & Design; Management Science

DAVID L. MECK Visiting Professional Lecturer of Computer Science and Director, Marist z/OS and zSeries Learning Center, 2002. *Degree:* B.S., Pennsylvania State University. *Specialty:* Large-Scale Operating Systems

ROGER NORTON Associate Professor of Computer Science, 1980. *Degrees:* B.S., University of Massachusetts; M.A., Brandeis University; Ph.D., Syracuse University. *Specialties:* Semantics of Programming Languages; Object-Oriented Programming; Distributed Computing; Grid Computing

ONKAR SHARMA Professor of Computer Science, 1986. *Degrees:* B.S.E., Bahar Institute of Technology; M.S.C.S., University of California at Berkeley; Ph.D.C.S., New York University. *Specialties:* Computer Architecture; Systems Software

JAMES TENEYCK Assistant Professor of Computer Science, 1983. *Degrees:* B.S., Lafayette College; M.S., Syracuse University; Ph.D., Syracuse University. *Specialties:* Computer Networks; Simulation