INFORMATION SYSTEMS AND QUANTITATIVE ANALYSIS

The study of Information Systems and Quantitative Analysis involves application of computers, mathematics, statistics, and other quantitative techniques in the solution of a wide variety of business problems. While computer science often concentrates on building the computer tools which make computers useful, it is information systems and quantitative analysis which specifically focuses on effectively applying these tools in the solution of everyday business problems.

The discipline of information systems (IS) includes the acquisition, deployment and management of information systems resources. IS encompasses the development, implementation and management of computers, communications and data for organization-wide systems as well as departmental and individual technology systems. It also includes the responsibility for acquiring new information technology and incorporating it in the organization’s strategy, planning and practices.

IS also includes the development and evolution of organizational infrastructure and systems to support organizational processes by applying methods, techniques and technology. The creation of information systems requires innovative and quality human machine systems and interfaces as well as recognition of socio-technical design issues and change management.

Accreditation Information

The Bachelor of Science in Management Information Systems has been accredited by the Computing Accreditation Commission of ABET, Inc., the recognized accreditor of college and university programs in applied science, computing, engineering, and technology. ABET accreditation demonstrates a program's commitment to providing its students with a quality education.

More information about the College’s accreditation and learning objectives can be found online at http://www.ist.unomaha.edu/?p=about/abetaccred. Specific program educational objectives for the ABET accredited programs in Management Information Systems can also be found on the following Web page: http://www.ist.unomaha.edu/?p=about/abetaccred.

Other Information

Admissions

Integrated Undergraduate/Graduate Track (IUG) in Management Information Systems

The IUG track is a 144-hour undergraduate-graduate option that allows eligible students to work toward the MS in MIS degree requirements while completing their undergraduate degree. Students interested in this option will work closely with an advisor and a faculty mentor to develop an integrated plan of study.

General Guidelines

Time of Admission to the Program

Students will be eligible for admission to the integrated degree program when they have completed their junior year in the College of IS&T. Students can apply for consideration in the last part of their junior year. Student will start taking courses in the graduate program in their senior year.

Joint Admission

Students must apply to and meet admission requirement of the MS in MIS graduate program.

Plan of Study

In consultation with an adviser and a faculty mentor, students will be required to prepare a plan of study. The plan will cover the entire time period of the program and it will be periodically reviewed with an adviser.

Advising

Students will present their portfolio and a plan of study in person to the integrated program committee prior to being admitted to the program.

Tuition charges

Students will be required to pay graduate tuition rates when taking graduate courses.

Admission Requirements and Procedures

1. Students with junior standing and at least 85-90 hours of completed course work in their undergraduate degree program may apply for admission consideration into the integrated undergraduate/graduate (IUG) track.

2. Interested students will be required to present a “portfolio” of the following credentials.
   a. Three letters of recommendations, at least two from faculty.
   b. Statement of intent—a personal statement about why the student wishes to apply for the IUG track.
   c. Undergraduate transcripts
   d. Other supporting documents (e.g., projects and papers, software, work experience, etc.) should be included where possible.

3. Students are highly encouraged to identify and work with a faculty mentor who knows their background and can champion their application to the IUG track.

4. All applicants will need to meet any other admission requirements established for the MS in MIS program. Other Requirements:
   a. The application to the IUG track will be considered as a complete package and therefore obtaining a high UGPA and/or GMAT/GRE Score is not a guarantee of admission.
   b. Students are allowed to apply up to 12 hours of ISQA 8xx5 or ISQA 8xx6 courses towards the undergraduate degree.

Student Groups

MISSO - the MIS Student Organization - was founded in 1999 and has been an active part of UNO ever since. In the past few years, MISSO has hosted guest speakers from a variety of information systems-related companies and organizations. MISSO has also sponsored field trips, workshops, and a variety of social events.

MISSO’s goals are:

• To provide a sense of community and camaraderie among students enrolled in and/or interested in the MIS program.
• To provide MIS students with career development advice and contacts through professional and social events.
• To provide students with presentations by and valuable contacts with professionals in business and industry.

MISSO has a general meeting once a month, usually featuring a guest speaker. In addition, other activities are planned. MISSO membership is open to all UNO and UNL students. Students of all majors who are interested in the field of information systems are invited to join the meetings. http://www.unomaha.edu/college-of-information-science-and-technology/information-systems-and-quantitative-analysis/student-involvement/index.php
In particular, students interested in obtaining a Bachelor of Science in Management Information Systems (BIS) degree will provide the students with the educational background for pursuing an exciting career in applying computers in business and government to process data and solve a wide variety of business problems. The computer is an important tool, which processes information for management decision-making. Managers can be more effective and efficient when assisted by computer-based information systems. The student will learn how the computer can be applied to produce information both for controlling the day-to-day operations of a business and for planning for the future of that business. Information systems and quantitative analysis produce the educational background appropriate for pursuing career opportunities in business data management, management information systems, information centers, systems analysis, systems design, decision support, information security, electronic commerce, and other related areas.

A minimum of 120 credit hours is required for the degree. Thirty of the last 36 hours required for the degree must be registered for and carried at UNO. Registration in courses without having taken the stated prerequisites could result in administrative withdrawal. To obtain a BIS a student must fulfill certain university, college and departmental requirements listed below.

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### Integrated Undergraduate/Graduate Track (IUG) in Management Information Systems

The department of Information Systems and Quantitative Analysis offers an Integrated Undergraduate/Graduate Track which allows dedicated students to complete the BS and in MIS undergraduate degree and the MS in MIS graduate degree in five years. The primary purpose of UNO’s College of IS&T’s Integrated undergraduate/graduate (IUG) track in MIS is to provide outstanding students in the College of IS&T an option to complete the BS undergraduate degree in MIS and the MS graduate degree in MIS in five years (144 total hours). The IUG program is designed for dedicated students who are motivated and willing to take on the challenges relating to graduate education. As such, the program involves both intensive study and preparation in the MIS field. Interested students are encouraged to meet with their adviser to find more information about this track.

### Second Baccalaureate Degree

A student who has met the degree requirements for a BS in MIS at the University of Nebraska at Omaha must complete a minimum of 30 additional semester hours at the University for a second, (different), degree. In particular, students interested in obtaining a Bachelor of Science in Business Administration should plan early in their academic career with an adviser to reduce the number of hours needed to accomplish this task. ISQA, in conjunction with the College of Business Administration, has developed a set of courses, which can satisfy requirements in each college. The two baccalaureate’s degrees may be awarded simultaneously when the student becomes eligible to receive them.

### Minors Offered

- **Management Information Systems Minor**
- **Management Information Systems for Accounting Majors Minor**
- **Enterprise Resource Planning (ERP) Systems for Business Majors Minor**

### Minor in Management Information Systems

A minor in management information systems may be obtained by completing ISQA 3310, ISQA 3910 and ISQA 4110, plus three hours of upper-division information systems and quantitative analysis courses in management information systems. A grade of "C-" or better is required in each course applied toward this minor in management information systems.

### Minor in Management Information Systems for Accounting Majors

Courses have been approved by the departments of ISQA and Accounting as specifically relevant to students in the accounting area. The prerequisites are consistent with course requirements of accounting students.

### Minor in ERP Systems for Business Majors

Enterprise Resource Planning (ERP) systems such as SAP, PeopleSoft or Oracle are used to integrate internal and external management of information across an entire organization-embracing finances/accounting, manufacturing, sales and service, customer relationship management, etc. The purpose of ERP is to facilitate the flow of information between all business functions inside the boundaries of the organization and manage the connections to outside stakeholders. The college of IS&T offers a variety of courses that utilize ERP systems as a technology platform to apply course concepts.

### Certificates Offered

- **Data Management Certificate**
- **Systems Development Certificate**
- **Information Technology Administration Certificate**

Undergraduate certificates allow the college of IS&T to offer a path for individuals who do not hold a baccalaureate to advance their education along a focused, professional-oriented course of study and to have those studies acknowledged, documented, and later (should the student so desire) to a related bachelor’s degree program.

The goal of the certificate is to provide non-traditional and traditional students an opportunity to take a focused set of undergraduate courses and earn a certificate of completion. Prospective students in the workplace who have only an Associate Degree would benefit from advanced certifications in targeted areas. Such certifications fit with organizational professional
development requirements and could be used, at the discretion of the organization, as professional development units (PDUs).

Data Management
Data Management (DM) is the practice of managing data-related issues for organizations. Data management practitioners seek to optimize the design, storage, and use of organizational data.

Systems Development
Systems Development practitioners seek to optimize the design, implementation, and use of information systems for organizational purposes.

Information Technology Administration
The undergraduate certificate in Information Technology (IT) Administration is designed for students who are interested in managing the complex technical infrastructure of today’s organizations and is offered in partnership with University of Agder in Norway (UiA), a sister university to UNO. The certificate consists of 14 credit hours of hands-on courses, covering such areas as systems administration, network administration, database administration, security administration, and distributed systems. All courses will be offered online. Students will take courses taught by both UNO and UiA instructors and will have the opportunity to work with students residing in a country other than their own.

ISQA 2000 SPECIAL TOPICS IN INFORMATION SYSTEMS AND QUANTITATIVE ANALYSIS (1-5 credits)
The course content and topic will vary. Please contact the ISQA department office for specific course offerings. Prerequisite(s)/Corequisite(s): Permission of instructor. Additional prerequisites may be required for particular topic offerings.

ISQA 3150 PRINCIPLES OF QUANTITATIVE ANALYSIS (3 credits)
An introduction to structuring real-life situations into mathematical models. The class covers four groups of decision making models: decision trees, inventory, linear programming, network planning, and winning strategy. A number of the existing commercial computer software packages will be used in the course.
Prerequisite(s)/Corequisite(s): CIST 2500

ISQA 3300 FILE STRUCTURES FOR INFORMATION SYSTEMS (3 credits)
The purpose of this course is to introduce the student to computer file organizations and access methods. A fundamental understanding of the performance implications of each file organization is developed to allow the students to make information systems design choices that will optimize the performance of business information systems.
Prerequisite(s)/Corequisite(s): CSCI 1620

ISQA 3310 MANAGING THE DATABASE ENVIRONMENT (3 credits)
Introduction to business database design and management functions. The focus is on the use of current database management systems (DBMS) to support the data management function of an organization. Topics include data modeling, database design, SQL, data management and database administration. Hands-on experience in database design, creation, and use is provided.
Prerequisite(s)/Corequisite(s): CIST 2100.

ISQA 3400 BUSINESS DATA COMMUNICATIONS (3 credits)
Data Communications principles and service operations with computers and telecommunication systems for operational analysis and decision making. This course will focus on breadth, not depth – concepts rather than specific technologies because concepts remain constant over time, while technologies change from year to year. Students are expected to master the basic terminologies and concepts, not necessarily to become experts in computer networking, nor to know the engineering details of any technology.
Prerequisite(s)/Corequisite(s): CIST2100

ISQA 3420 MANAGING IN A DIGITAL WORLD (3 credits)
This course introduces the fundamentals of information systems/technology (IS/IT) management. Students are introduced to the various roles, responsibilities, skills, and concepts essential to successful management of IS/IT in the context of a dynamic environment of technology workforce diversity, a global economy, and concern for ethics and social responsibility in the development of systems.
Prerequisite(s)/Corequisite(s): CIST 2100
Distribution: Global Diversity General Education course

ISQA 3520 GRAPHICAL USER INTERFACE DESIGN (3 credits)
This course is an introduction to interaction design with a primary emphasis on designing usable and useful computer interfaces. Students will learn the principles of interface design grounded in a fundamental understanding of human cognitive processes. They will learn how end-users develop and use mental models of interaction and will apply this knowledge to the design of interfaces for real-world applications. A design project will challenge students to plan their own designs, to develop interfaces and to integrate them into a working application prototype, to test their application with real users, and to effectively communicate the overall results. (Cross-listed with ISQA 8525)
Prerequisite(s)/Corequisite(s): CIST 1300

ISQA 3910 INTRODUCTION TO PROJECT MANAGEMENT (3 credits)
This course will cover the basics of project planning, scheduling and control. Earned value management techniques and project quality will be covered. Risk management will also be covered. The student will be introduced to the IEEE Standards for Project Management. The purpose of the course is to provide students with an introduction to the tools and techniques used to manage projects to achieve successful completion. The project management methods taught are suitable for a wide variety of project types such as software development or engineering projects (e.g. construction).
Prerequisite(s)/Corequisite(s): CIST 2100; or equivalent.

ISQA 4000 SPECIAL TOPICS: INFORMATION SYSTEMS & QUANTITATIVE ANALYSIS (1-5 credits)
This course is designed to acquaint students with issues which are current to the field or harbingers of emerging trends in the information systems area. Topics will vary across terms. This course may be repeated, but no topic may be taken more than once. (Cross-listed with ISQA 8086)
Prerequisite(s)/Corequisite(s): Permission of instructor. Additional prerequisites may be required for particular topic offerings.

ISQA 4010 BUSINESS INTELLIGENCE (3 credits)
The course focuses on the various topics on knowledge management by utilizing both behavioral approaches and information technology tools. It includes data collection and analysis, intelligent agents, business concerns on data warehousing and data mining, customer relationship management. The course will also cover information overload, human expert systems vs. artificial intelligent systems and intelligent decision making.
Prerequisite(s)/Corequisite(s): CIST 1400; CIST 2500

ISQA 4100 INFORMATION SYSTEMS ARCHITECTURE AND ORGANIZATION (3 credits)
This course examines the frameworks and tools used to develop an organization’s information system architecture. It provides the analytical skills and conceptual frameworks with which to make recommendations and decisions regarding the integration of information technology components into an information system architecture. (Cross-listed with ISQA 8106)
Prerequisite(s)/Corequisite(s): CIST 2100 and ISQA 3310

ISQA 4110 INFORMATION SYSTEMS ANALYSIS (3 credits)
This course examines and applies the principles of information systems analysis, following a structured systems development methodology. It surveys project management, feasibility and analysis and systems requirement definition using modern systems analysis techniques and automated tools. Course utilizes a case approach where students initiate the analysis and logical design of a limited-scope information system.
Prerequisite(s)/Corequisite(s): CIST 2100, ISQA 3910 and ISQA 3310 prior to or concurrent.
ISQA 4120 SYSTEM DESIGN AND IMPLEMENTATION (3 credits)
This is the second course in a sequence in computer information systems analysis, design, and implementation. This course extends the basic foundations of systems development started in ISQA 4110 and examines the activities comprising the design, construction and implementation of information systems.
*Prerequisite(s)/Corequisite(s):* ISQA 3310 and ISQA 4110

ISQA 4130 INFORMATION TECHNOLOGY FOR DEVELOPMENT (3 credits)
Information Technology for Development (ITD) is the implementation and evaluation of information technology infrastructure to stimulate economic, social and human development. In this service-learning course, students will learn and apply ITD concepts for developing and adding value through IT by working with small business entrepreneurs in Omaha or rural Nebraska. Students will evaluate micro-business technology needs, prepare business technology plans, provide training, and implement appropriate solutions, to the extent possible within a semester class. (Cross-listed with ISQA 8136)
*Prerequisite(s)/Corequisite(s):* Though not required, the following courses or their equivalent would provide the necessary background: CIST 1100, CIST 1300, ISQA 3210, ISQA 3310, ISQA 3400. Not open to non-degree graduate students.

ISQA 4150 ADVANCED STATISTICAL METHODS FOR IS&T (3 credits)
This course emphasizes the application and interpretation of statistical methods including design of experiments, analysis of variance, multiple regression, and nonparametric procedures and the use of statistical computer packages. The intent is to develop quantitative abilities needed for quantitatively intensive jobs and for advanced study in management information systems, computer science and information technology. (Cross-listed with ISQA 8156)
*Prerequisite(s)/Corequisite(s):* CIST 2500 or equivalent, at least one course in statistics, and an understanding of basic calculus (a calculus review will be conducted at the beginning of class).

ISQA 4160 INTRODUCTION TO ENTERPRISE RESOURCE PLANNING (3 credits)
Introduction to Enterprise Resource Planning (ERP) is designed to expose students to the primary enterprise application that forms the information systems (IS) infrastructure for most large organizations today. The primary purpose of this course is for students to gain an understanding of the enterprise wide, cross functional nature of ERP software. In the process of learning about ERPs, the students develop "hands on" experience with the largest and most well-known ERP application, SAP. (Cross-listed with ISQA 8166, SCMT 4160)
*Prerequisite(s)/Corequisite(s):* CIST 2100 or equivalent. Not open to non-degree graduate students.

ISQA 4180 ELECTRONIC COMMERCE (3 credits)
Critical examination of the issues, technologies, standards and business and social implications of electronic commerce in Cyberspace.
*Prerequisite(s)/Corequisite(s):* ISQA 3400 or equivalent.

ISQA 4190 PROCESS REENGINEERING WITH INFORMATION TECHNOLOGY (3 credits)
Business process reengineering issues are examined. Reengineering concepts and methods are introduced. Additional special project(s) are required. SAP will be introduced. (Cross-listed with ISQA 8196)
*Prerequisite(s)/Corequisite(s):* CIST 2500; prerequisite/co-requisite ISQA 4110.

ISQA 4200 INFORMATION AND DATA QUALITY MANAGEMENT (3 credits)
The course primarily focuses on developing an in-depth understanding of Data and Information Quality (DQ and IQ) concepts and issues. On completing this course students will be able to understand and use DQ and IQ Concepts in Information Systems projects, be able to recognize various patterns of Data and Design Deficiencies in Systems and be able to suggest appropriate DQ and IQ improvement plans in light of known deficiencies in systems. (Cross-listed with ISQA 8206)
*Prerequisite(s)/Corequisite(s):* CIST 2500 and CIST 2100.

ISQA 4300 DATABASE ADMINISTRATION (3 credits)
This course is designed to give students an applied, practical introduction to database administration. Students will gain an understanding of the functioning of a database management system and its relationship to the computing environment in which it runs. They will learn the concepts, principles, and techniques necessary to carry out such functions as database object creation, storage management, capacity planning, performance tuning, backup and recovery, and security management. Each semester the course will focus on one commercial database management system (DBMS), such as Oracle. (Cross-listed with ISQA 8306)
*Prerequisite(s)/Corequisite(s):* ISQA 3300, ISQA 3310 or CSCI 4850. Not open to non-degree graduate students.

ISQA 4380 DISTRIBUTED TECHNOLOGIES AND SYSTEMS (3 credits)
The course introduces students to concepts, issues and tools needed to develop distributed computing systems. Topics include distributed systems architecture, middleware, Internet-based systems development, security and performance. Hands-on systems development using current technologies is provided.
*Prerequisite(s)/Corequisite(s):* ISQA 3310 or equivalent and knowledge of database design and SQL.

ISQA 4500 SPECIAL PROBLEMS IN INFORMATION SYSTEMS AND QUANTITATIVE ANALYSIS (2-3 credits)
Individual investigation of specific problems in information systems and quantitative analysis and related areas.
*Prerequisite(s)/Corequisite(s):* Senior and permission of program chair.

ISQA 4510 INFORMATION SYSTEMS INTERNSHIP (1-3 credits)
The purpose of this course is to provide the students with an opportunity for practical application of their academic studies in the business world to help prepare them for their professional career and to provide a view of the challenges they will face.
*Prerequisite(s)/Corequisite(s):* Junior/senior standing and permission of department.

ISQA 4590 IT AUDIT AND CONTROL (3 credits)
This course explores organizational and managerial issues relevant to planning and conducting IT audit and control activities. The course covers the following conceptual areas: business risks and the management of business risk, IT risk as a component of business risk, the need to manage IT risks, and the basic type of controls required in a business system in order to control IT risks. Issues associated with new risks created by the use of the internet for business applications and electronic business are also covered. (Cross-listed with ISQA 8596)
*Prerequisite(s)/Corequisite(s):* A solid understanding of business foundations such as accounting and introductory auditing and exposure to the IS discipline is essential for success in this course. Permission of instructor is required to enroll.

ISQA 4730 DECISION SUPPORT SYSTEMS (3 credits)
This course examines a set of information systems which specifically support managerial decision makers: Decision Support Systems, Group Decision Support Systems, Executive Information Systems, Data Warehouses, Expert Systems, and Neural Networks. This course explores the development, implementation, and application of these systems, how these systems can be applied to current business problems, as well as how organizational and managerial issues impact the implementation and usage of these systems. (Cross-listed with ISQA 8736)
*Prerequisite(s)/Corequisite(s):* CIST 2100 or equivalent.
ISQA 4880  SYSTEMS SIMULATION AND MODELING (3 credits)
The course provides an introduction to the modeling and simulation with special emphasis on decision-theoretic models and rational decision-making. The ability to make good decisions is key to individuals and organizations and studying, understanding and improving decisions is vital to success. Students are given a background into systematic decision-making processes, and then are introduced to formal methods for decision modeling and analysis. Building on these foundational models, students learn how to perform process modeling and optimization. Finally, the course concludes with a look at psychological biases and traps that may affect decision-makers. (Cross-listed with ITIN 4880)

Prerequisite(s)/Corequisite(s): CIST 1400 and CIST 2500 or equivalent

ISQA 4890  DATA WAREHOUSING AND DATA MINING (3 credits)
This course provides students with a theoretical foundation and practical methods for designing and constructing data warehouse and implementing data mining. After covering the essential concepts, issues, techniques to build an effective data warehouse, this course emphasizes the various techniques of data mining, such as association, classification, clustering and prediction for on-line analyses within the framework of data warehouse architectures. This course gives students an opportunity to undertake a real-life data analysis project. (Cross-listed with CSCI 4890).

Prerequisite(s)/Corequisite(s): ISQA 3310 or CSCI 4850

ISQA 4900  INTERNET SYSTEMS DEVELOPMENT (3 credits)
This course focuses on contemporary techniques and technologies in the design, development, and integration of web-enabled information systems. Topics include: Multi-tiered systems architecture; rapid application development; object-oriented analysis and design; prototyping; testing, verification, and validation; lifecycle models; and component-based development. This is a rapidly moving, hands-on course that mirrors real-world development.

Prerequisite(s)/Corequisite(s): CSCI 2850 and CSCI 2830 plus completion of two additional courses within the IT concentration.