The Stern School of Business has always been a leader among management schools in teaching and research on information technology in business. In the current climate of rapid globalization and electronic commerce, an understanding of why and how information technology is driving changes in markets and businesses is essential. Increasingly, many of the strategic and day-to-day decisions general managers face involve information technology. The information systems (IS) major provides students with the skills and knowledge they require to prepare for and manage the transition from entry-level positions to management.

The central questions that our information systems courses address are the following:

1. How do information technologies transform businesses, industries, and society?
2. Why do some organizations get value from their information technology investments while others do not?

David Baker, Stern alumnus and former global head of program trading at Deutsche Bank, puts understanding about information technologies in perspective: “Decisions about information technology are critical,” he says “as is the ability to understand and work with systems. In this emerging marketplace, a strong background in information technology is essential for opening doors as well as career advancement.”

Professionals with skills in management and information systems work in both business and government. Typical problems handled by IS professionals include management of the information infrastructure of organizations, aligning information technology strategy with business strategy, and making decisions about the technology requirements of the various functional areas of organizations. Information technology skills are particularly important in careers across financial services, consulting, telecommunications, and technology.

Students majoring in information systems should consult with their adviser in the Office of Academic Advising by the end of their sophomore year to ensure that course distribution requirements are being met and to declare formally the information systems major. The information systems undergraduate faculty adviser is always available to advise on information systems course selection or other matters information systems students may wish to discuss.

Program of Study

INFORMATION SYSTEMS MAJOR REQUIREMENTS (12 CREDITS)
An information systems major at Stern requires four information systems electives in addition to the core course, C20.0001. Students who wish to pursue a career in information technology are advised to take C20.0035 and C20.0046 as two of their required four courses. Students may also take selected computer science electives, with the permission of the undergraduate faculty adviser.

INFORMATION SYSTEMS SPECIALIZATIONS REQUIREMENTS (9 CREDITS)
Information systems offers different areas of study, known as specializations, that are separate from the information systems academic major. They are designed for students who...
Courses

FUNDAMENTAL COURSE
Information Technology in Business and Society
C20.0001 4 credits. Fall and spring.
Prerequisite: sophomore standing.
Provides the background necessary to make decisions about computer-based information systems and to be an “end-user.” Two major parts of the course are (1) hands-on experience with personal computers and (2) information systems management. Group and individual computing assignments expose students to electronic spreadsheet analysis and database management on a personal computer. Management aspects focus on understanding computer technology, systems analysis and design, and control of information processing by managers.

ADVANCED COURSES
Design and Development of Web-Based Systems
C20.0022 3 credits. Spring.
The Web and the new technologies and standards surrounding it have dramatically changed the way systems are developed and used in organizations and markets. This course covers the issues and concepts in developing data-driven Web sites. Students evaluate a variety of different Web development approaches and architectures, including the common gateway interface models Java, Active Server Pages, .NET, and Web services. A variety of alternative development approaches are compared, looking at issues such as the development environment and the security, performance, scalability, and maintainability of systems developed with the different approaches. The class is divided into student teams. Each team implements a small system using one of the supported technologies and evaluates their experience. Students should have the ability to build a simple Web page and be proficient with common Microsoft Office business applications, especially Access. Light programming is used for examples of how to build dynamic Web pages for B2C and B2B sites. Assignments include both Active Server Pages as well as J2EE, Unix, Windows 2000, and Linux platforms are available to host projects.

Fundamentals of Computer Systems
C20.0035 3 credits. Fall and spring.
Prerequisite: programming experience.
This course provides an in-depth introduction to some of the major computer technologies, including computer systems organization, operating systems, Java programming, and Web technologies. Students learn the material through a combination of class lectures and discussions, in-class demos, homework assignments, and a project.

The material covered in this course is divided into the following modules: (1) a crash course in Java, (2) an overview of some of the key Web technologies, and (3) computer organization and operating systems. The purpose of the brief overview of Java is to familiarize the students with the main concepts of the language so that they can develop sufficient familiarity with the language and acquire basic programming skills required in other parts of this course and possibly other IS courses. It is assumed that the student is either already familiar with basic programming concepts (such as variables, arrays, conditional branching, loops, etc.) or will be able to learn them fast. At the end of this module, the students are expected to be able to write simple Java programs.

Web-Based Systems
This specialization is designed for students who want a deeper understanding of Internet technologies. The Internet has become the standard method of delivering content to both internal and external users, as well as the basis for new standards for interfacing between business processes. This specialization includes courses that cover both development techniques for Web-based systems as well as business applications.

C20.0035 Fundamentals of Computer Systems (required for specialization)
C20.0022 Design and Development of Web-Based Systems
C20.0038 Electronic Commerce
C20.0046 Database Management Systems

Information Systems

C20.0006 Operations in Financial Services
C60.0007 Decision Models

Enterprise Systems
This specialization is designed for students who are interested in the implementation and implications of enterprise-wide systems and tools for personal productivity. The courses are especially useful for students who wish to enter a career in consulting.

C20.0038 Electronic Commerce (required for specialization)
C20.0022 Design and Development of Web-Based Systems
C20.0046 Database Management Systems
C20.0057 Data Mining for Business Intelligence
C60.0007 Decision Models

Financial Systems
This specialization is designed for students majoring in finance who want to understand systems in the financial services industry.

C20.0050 Financial Information Systems (required for specialization)
C20.0046 Database Management Systems
C20.0057 Data Mining for Business Intelligence

Decision Models
C60.0007

Operations in Financial Services
C60.0006

Electronic Commerce (required for specialization)
C20.0038

Design and Development of Web-Based Systems
C20.0046

Database Management Systems
C20.0057

Data Mining for Business Intelligence
C60.0007

Decision Models
C60.0006

Operations in Financial Services
C60.0007

Decision Models

zation of the main components of a computer system including CPU, memory, buses, and I/O devices. They also learn how a computer works by studying the fetch-decode-execute cycle and what a Java Virtual Machine (JVM) is and how it works. After that, they study the basics of operating systems, i.e., what an operating system is, how it works, and what computer resources it manages and how. Then the course provides an in-depth coverage of how an operating system manages processors, memory, files, and different I/O and networking devices.

Upon the completion of this course, the students are able to (1) understand some of the current important Web technologies, including Java, XML, DOM/SAX/JAXP, and Web services technologies; (2) understand the organization of modern computers and the principles of operations of operating systems; and (3) develop practical hands-on skills by learning Java, XML, and other Web technologies.

Electronic Commerce
C20.0038 3 credits. Fall and spring. Prerequisite: sophomore standing.

This course provides an understanding of e-commerce and its impact on firms, industries, and markets. In a few short years, the Web has already had a large impact on how we shop, read, conduct business, learn, and consume information like music and art. The fundamental architecture of information processing within the firm is changing as new Internet technologies appear. Internet technologies are also having a broad impact on the management of firms. How well firms are able to master these new technologies and business models is having an important impact on their overall success. This course describes the technologies used in electronic commerce; discusses the resulting changes in organization structure, industry, and societal behavior and seeks to understand the forces that bring about these changes; and, where possible, extrapolates to the next five years.

Database Management Systems
C20.0046 3 credits. Fall and spring. Prerequisite: some programming experience.

This course focuses on the overall management of the data needs of an organization and the design and development of database applications. Covers global database architecture, logical and physical data design, and the integration of databases with programming and fourth-generation languages. Topics include conceptual data modeling, data security and integrity, distributed data management, recovery strategies, and overall database administration. Students learn the SQL language—an industry standard for relational databases—and design their own database applications using an available database management system such as Microsoft Access or Oracle.

Financial Information Systems
C20.0050 3 credits. Fall. As financial markets become more electronic and more liquid, a higher degree of knowledge about systems and analytics is required in order to compete. This course teaches students how modern financial markets function as a network of systems and information flows, and how to use information technology for decision making in trading and managing customer relationships. Information systems serve two purposes in the financial industry. First, they facilitate markets and their supporting services such as payment, settlement, authentication, and representation. Second, they facilitate or engage in making decisions such as when and how much to invest in various instruments and markets. The first part of the course describes how systems facilitate various kinds of payment and settlement mechanisms, enable financial markets such as exchanges and ECNs, and support inter-institutional communication. The second part of the course describes how traders, analysts, and risk managers use systems to cope with the vast amounts of data on the economy, markets, and customers that flow into their systems each day. It covers automated trading systems and other types of customer-oriented analytic systems that are becoming increasingly intelligent in how they make or support decisions. The course features a mix of case studies, Excel-based illustrations and assignments, and the latest industry tools. It is particularly suited for finance and marketing students interested in understanding information technologies in financial services from a practical career standpoint.

Data Mining for Business Intelligence
C20.0057 3 credits. Spring. This course changes the way you think about data and its role in business. As the volume of data collected by organizations continues to grow rapidly, being able to extract intelligence from data leads to competitive advantage. Individuals experienced with data manipulation and sophisticated analysis are in short supply. This course teaches students how to structure and solve business problems using data-driven analysis and modeling. It combines example-based discussions and hands-on learning with the most extensively used data-mining software. The course has three closely related goals:
1. To introduce students to state-of-the-art data-mining methods that support decision making by extracting useful knowledge from the increasingly large volume of data that organizations collect.
2. To provide an analytical framework within which students can apply these data-mining techniques successfully to data-rich business problems.
3. To give students hands-on experience with using the techniques to extract knowledge from data.

The course is taught primarily through examples from finance, marketing, operations, security, spam-filtering, online retailing, online advertising, and others. The emphasis is on creative problem formulation and analysis. Technical details are kept to a minimum. The course assumes prior knowledge of Microsoft Excel and the fundamentals of finance, marketing, and operations at the level of the core courses at Stern. Prior experience with a programming language or with data mining is useful but not necessary.

Independent Study in Information Systems
Fall and spring. Prerequisite: permission of the undergraduate faculty adviser.

Students work one-on-one with a faculty member on a topic that the student selects and is approved by the supervising faculty member. Students are expected to spend as much time on the independent study as would be spent on a regular course, and the topic selected may not replicate an existing course.