

# INFORMATION SYSTEMS

Information systems is the area of computer science that focuses on analyzing the information needs of organizations and devising IT solutions that meet cost requirements and promote strategic goals. IS professionals fill a critical role across many sectors; they implement and manage complex systems projects, design business processes, and provide support of management and decision-making.

In pursuing a degree in information systems, students learn concepts, skills, and technologies that enable organizations to manage and improve the flow of information. They explore how data is collected, stored, processed, and communicated as a means of sustaining operations, interacting with customers and suppliers, and competing in the marketplace. Students learn to navigate both software and hardware challenges as they analyze problems in real-world cases. Skills that are crucial for working within organizations – professional communication, critical thinking, and collaboration—are developed through courses in business communication and leadership. Instructors for all courses are working professionals; their practical knowledge shapes the classroom experience.

## Accelerated MSIS Degree for Information Systems Majors

Students who complete their bachelor's degree at SPS with a major in Information Systems can apply for the Accelerated Master's in Information Systems program (<https://www.sps.northwestern.edu/masters/information-systems-accelerated/>) at SPS and apply undergraduate courses to that degree—saving both time and tuition.

To apply to the master's degree program, the following two undergraduate courses should be completed during the undergraduate program with a grade of B or higher.

Course	Title
CIS 313-CN	Telecommunications and Computer Networks
CIS 317-CN	Database Systems Design & Implementation

Students can apply to the master's program while the undergraduate degree program is still in progress; they should submit the application for the master's program within the final two quarters of their undergraduate program. Applicants who meet admissions criteria are granted conditional acceptance, with full acceptance contingent on successful completion of the undergraduate program.

View the Accelerated Master of Science in Information Systems (<https://www.sps.northwestern.edu/masters/information-systems-accelerated/>) program website to learn more.

## Degrees Offered

- Information Systems, BPhil (<https://catalogs.northwestern.edu/sp/undergraduate/information-systems/information-systems-bphil/>)
- Information Systems, BSGS (<https://catalogs.northwestern.edu/sp/undergraduate/information-systems/information-systems-bsgs/>)

## Information Systems Courses

### CIS 110-CN Introduction to Computer Programming (1 Unit)

Introduction to programming practices for students who have no previous programming background. May not be audited or taken P/N.

### CIS 130-CN Tools and Technologies of the World Wide Web (1 Unit)

Introduction to the current tools and technologies used for designing and developing interactive websites.

### CIS 212-CN Introduction to Object-Oriented Programming (1 Unit)

Introduction to core elements of object-oriented programming; transfer of those concepts into Java language. May not be audited or taken P/N.

**Prerequisite:** CIS 110-CN.

### CIS 313-CN Telecommunications and Computer Networks (1 Unit)

Overview of telecommunications and computer networks. May not be audited or taken P/N.

### CIS 314-CN Intermediate Programming (1 Unit)

Concepts and practices of advanced object-oriented software design and development. May not be audited or taken P/N.

**Prerequisite:** CIS 212-CN.

### CIS 317-CN Database Systems Design & Implementation (1 Unit)

This course covers the fundamentals of database design and management. Topics include the principles and methodologies of database design, database application development, normalization, referential integrity, security, relational database models, and database languages. Principles are applied by performing written assignments and a project using an SQL database system.

### CIS 323-CN Python for Data Science (1 Unit)

Overview of Python programming language with emphasis on capabilities to analyze data. May not be audited or taken P/N.

**Prerequisite:** CIS 212-CN and STAT 202-CN or equivalents.

### CIS 323-DL Python for Data Science (1 Unit)

Introduction to data science concepts, techniques, and tools with an emphasis on building practical business applications. May not be audited or taken P/N.

**Prerequisite:** CIS 323-CN or equivalent.

### CIS 324-CN Applied Data Science (1 Unit)

Introduction to data science concepts, techniques, and tools with an emphasis on building practical business applications. May not be audited or taken P/N.

**Prerequisite:** CIS 323-CN or equivalent.

### CIS 324-DL Applied Data Science (1 Unit)

Introduction to data science concepts, techniques, and tools with an emphasis on building practical business applications. May not be audited or taken P/N.

**Prerequisite:** CIS 323-CN or equivalent.

### CIS 325-CN Enterprise Data Science (1 Unit)

Overview of enterprise data science tools, processes, and environment. Application of data science and machine learning techniques in an enterprise environment.

**Prerequisite:** CIS 324-CN or CIS 324-DL.

### CIS 325-DL Enterprise Data Science (1 Unit)

Overview of enterprise data science tools, processes, and environment. Application of data science and machine learning techniques in an enterprise environment.

**Prerequisite:** CIS 324-CN or CIS 324-DL.

### CIS 326-CN Data Engineering (1 Unit)

Overview of the discipline of data engineering, its tools and ecosystem.

**Prerequisite:** CIS 317-CN or equivalent, or knowledge of SQ.

### CIS 330-CN Human Computer Interaction (1 Unit)

Introduction to research that encompasses usability, design, information architecture, psychology, ethnography, and software engineering. Topics

include: contextual interviews; design process; prototype construction; evaluation techniques. May not be audited or taken P/N.

**CIS 345-CN Information Security (1 Unit)**

Practical knowledge to understand, manage, and ensure the security of an organization's information assets. Concepts of information security, business continuity, disaster recovery, and risk management are presented. May not be audited or taken P/N.

**Prerequisite:** CIS 313-CN or equivalent.

**CIS 350-CN Strategic Information Systems (1 Unit)**

This course examines current issues, themes, and research related to the strategic use of information systems in organizations at a high level. It focuses on the use of information and information technology for competitive advantage in businesses, organizations, and nonprofits. May not be audited or taken P/N.

**CIS 350-DL Information Technology Strategy (1 Unit)**

This course examines current issues, themes, and research related to the strategic use of information systems in organizations at a high level. It focuses on the use of information and information technology for competitive advantage in businesses, organizations, and nonprofits. May not be audited or taken P/N.

**CIS 365-CN Enterprise Software Development (1 Unit)**

Addresses the increasing need to integrate a broad range of data, information systems, and technologies across organizations to serve business goals. May not be audited or taken P/N.

**Prerequisite:** CIS 314-CN or equivalent.

**CIS 370-CN System Analysis and Design (1 Unit)**

Overview of the systems development lifecycle (SDLC), with an emphasis on developing quality software systems that meet business requirements and goals. Students acquire the basic skill set needed by business analysts in today's complex development environment. May not be audited or taken P/N.

**CIS 380-CN Information Architecture (1 Unit)**

Introduction to the concepts, foundations and components of information architecture (IA) in the digital environment of the World Wide Web. May not be audited or taken P/N.

**CIS 385-CN Programming for the Web (1 Unit)**

Introduction to the concepts, foundations, and components of programming for the web. May not be audited or taken P/N.

**CIS 394-CN Project Management Concepts (1 Unit)**

This course introduces effective frameworks and methods for developing information technology and systems strategies that focus on meeting enterprises business objectives and on leveraging IT to competitively extend business capabilities. Topics covered include business driver identification and business and IT alignment; key technology components of the IT strategy, including enterprise architecture, enterprise systems, SOA and other integration technologies, networks, and data management; portfolio management; sourcing and hosting alternatives; emerging technologies and entrepreneurship.

**CIS 395-CN Topics in Information Systems: (1 Unit)**

Topics vary. May be repeated for credit with different topic.

**CIS 399-CN Independent Study - Projects (1 Unit)**