

Information Science Major (Columbia College and General Studies)

Information science is an interdisciplinary major designed to provide a student with an understanding of how information is organized, accessed, stored, distributed, and processed in strategic segments of today's society. Recent years have seen an explosive growth of on-line information, with people of all ages and all walks of life making use of the World Wide Web and other information in digital form. This major puts students at the forefront of the information revolution, studying how online access touches on all disciplines, changing the very way people communicate. Organizations have large stores of in-house information that are crucial to their daily operation. Today's systems must enable quick access to relevant information, must ensure that confidential information is secure, and must enable new forms of communication among people and their access to information. The information science major can choose a scientific focus on algorithms and systems for organizing, accessing, and processing information or an interdisciplinary focus in order to develop an understanding of, and tools for, information modeling and use within an important sector of modern society such as economics or health.

Required courses: 33 points including a core requirement of five courses. Students must then select at least six upper-division elective courses, focusing on an information-intensive thematic area. The core requirement consists of [COMS W1001](#), *Introduction to information science*; [COMS W1004](#), *Introduction to computer science and programming in Java*; [COMS W1007](#), *Honors Introduction to Computer Science*; [COMS W3134](#), *Data structures in Java*; and *Probability and statistics* ([STAT 4001](#), formerly [SIEO W4150](#))

The six elective courses should be chosen with a faculty advisor to focus on the modeling and use of information within the context of a disciplinary theme. Following are some examples:

Information science and contemporary society: Students can focus on the fundamental principles and technologies involved in the organization, searching, transmission, and manipulation of on-line information by studying database management systems, information retrieval systems, Web search engines, and natural language processing technology. Alternatively, students may focus on how humans use technology and how technology has changed society. Given that these systems and technology often involve substantial interaction with humans, students are encouraged to take courses from human-focused areas such as human-computer interaction, psychology, and sociology.

- The requirements include three courses involving processing of text or data (e.g., [COMS W4111](#) *Introduction to Databases*, [COMS W4705](#) *Natural language processing*, [COMS W4771](#) *Machine learning*), two courses from human-focused areas (e.g., [COMS W4170](#) *User interface design*, [PSYC W2215](#) *Cognition: mind and brain*, [SOCI W3233](#) *Six degrees and the new science of networks*) and two application courses (e.g., from economics such as [ECON W3025](#) *Financial markets* or biology such as [BINF G4013](#) *Biological sequence analysis*)

Information science and the economy: Students can focus on understanding information modeling together with existing and emerging needs in economics and finance, as well as algorithms and systems to address those needs by taking courses in economics, finance, artificial intelligence and mathematical modeling. For example, students may take courses in machine learning, statistics and econometrics to understand how computers are enabling prediction modeling in many disciplines.

- The requirements include two courses in artificial intelligence and mathematical modeling (e.g., [COMS W4701 Artificial intelligence](#), [COMS W4771 Machine learning](#)), one course involving processing of text or data (e.g., [COMS W4111 Introduction to Databases](#)), and two courses each in economics (e.g., [ECON W1105 Principles of economics](#), [ECON BC3017 Economics of business organizations](#)) and finance (e.g., [IEOR E4007 Optimization models and methods for financial engineering](#), [IEOR E4308 Industrial budgeting and financial control](#))

Information Science and Health Sciences: Students can focus on understanding information modeling together with existing and emerging needs in health sciences, as well as algorithms and systems to address those needs by taking courses in computational biology, computational genomics, and biomedical informatics. For example, students may take courses that integrate computer science and biology, leading, for example, to understanding of the role that computational processes play in decoding the human genome.

- The requirements include three courses in either artificial intelligence and mathematical modeling (e.g., [COMS W4701 Artificial intelligence](#)), processing of text or data (e.g., [COMS W4111 Introduction to Databases](#)), or human computer interaction (e.g., [COMS W4170 User interface design](#)); three courses drawn from the biomedical area (e.g., [ECBM E3060/E4060 Introduction to genomic information science and technology](#), [BIOL W4037 Bioinformatics of gene expression](#), [BINF G4001 Introduction to computer applications in health care and biomedicine](#), [BINF G4004 Applied clinical information systems](#)); and one course drawn from a human centered area (e.g., [PSYC W2215 Cognition: mind and brain](#), [SOCI W3233 Six degrees and the new science of networks](#))

Questions?

Contact the course instructor if you have questions about a given course. Contact your advisor if you have questions about what track or course of study is best for you. Contact Adam Cannon (cannon@cs.columbia.edu), the Associate Chair for Undergraduate Education, with questions about the undergraduate curriculum. Contact Kathryn Angeles (kangeles@cs.columbia.edu), Student Affairs Officer, with administrative, scheduling, or any other questions you might have.