INFORMATION SCIENCE

Information science considers the relationships between people, places and technology—as well as the information or data those interactions yield. It unites a number of interdisciplinary approaches for understanding and shaping human-data interaction. Drawing on knowledge from social science, computing, data science and the humanities, information scientists support the study and innovation of "socio-technical systems."

Students will acquire broad skills in information science, including:

- multiple forms of information analysis, from small data to big data, from quantitative to qualitative, from data exploration to information exposition;
- skills in communicating information to different audiences;
- understanding social and ethical contexts of information and technology;
- human-centered design of data and artifacts;
- data curation; and
- computing to support information-analytic skills and prototype building.

Course code for this program is INFO.

Bachelor's Degree

- Information Science · Bachelor of Science (BS) (catalog.colorado.edu/undergraduate/colleges-schools/media-communication-information/programs-study/information-science/information-science-bachelor-science-bs)

Minor

- Information Science · Minor (catalog.colorado.edu/undergraduate/colleges-schools/media-communication-information/programs-study/information-science/information-science-minor)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aspray, William (https://experts.colorado.edu/display/fisid_157989) Professor; PhD, University of Wisconsin-Madison

Barker, Lecia Jane (https://experts.colorado.edu/display/fisid_101367) Associate Professor; PhD, University of Colorado Boulder

Brubaker, Jed Richards (https://experts.colorado.edu/display/fisid_156193) Assistant Professor; PhD, University of California-Irvine

Devendorf, Laura (https://experts.colorado.edu/display/fisid_158564) Assistant Professor; PhD, University of California Berkeley School of Information

Fiesler, Casey Lynn (https://experts.colorado.edu/display/fisid_155950) Assistant Professor; PhD, Georgia Institute of Technology

Keegan, Brian (https://experts.colorado.edu/display/fisid_158122) Assistant Professor; PhD, Northwestern University

Palen, Leysia A (https://experts.colorado.edu/display/fisid_114604) Professor; PhD, University of California-Irvine

Paul, Michael J (https://experts.colorado.edu/display/fisid_156070) Assistant Professor; PhD, Johns Hopkins University

Robinson, Rick Emery (https://experts.colorado.edu/display/fisid_156556) Senior Instructor; PhD, University of Chicago

Roque, Ricarose (https://experts.colorado.edu/display/fisid_158315) Assistant Professor; PhD, Massachusetts Institute of Technology

Szafr, Danielle N (https://experts.colorado.edu/display/fisid_156317) Assistant Professor; PhD, University of Wisconsin-Madison

Voida, Amy Kathryn Mitchell (https://experts.colorado.edu/display/fisid_155855) Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A (https://experts.colorado.edu/display/fisid_155856) Assistant Professor; PhD, Georgia Institute of Technology

Courses

INFO 1101 (3) Computation in Society
Introduces students to modern information and communication technology, the basic principles of software and programming, the fundamental role of algorithms in modern society, computational reasoning, the major organizations in the information sector and fundamental interactions between humans and information technology. Appropriate for students with limited prior experience with computing. Fulfills the CMCI computing requirement.

Grading Basis: Letter Grade

INFO 1111 (4) Introduction to Information Science: Understanding the World Through Data
Provides a hands-on survey of key concepts and theories in Information Science, including the nature of information, everyday experience of data, technologies that generate data, and how data are conveyed and represented. Students will critically examine texts, systems, and interpretations of data from multidisciplinary perspectives. Through design explorations, activities, and group projects, students will develop facility representing and transforming information.

Grading Basis: Letter Grade

INFO 1121 (4) Introduction to Information Science: Designing Interactions
Provides an introduction to human-centered design and the universal requirements of interactions with data, information and technologies. Studio experiences challenge students to consider the impact that information and computing technology design choices have on a) enabling diverse audiences to access, manipulate and experience information, and b) how differences get encoded by data and technology, ultimately reflecting biases.

Grading Basis: Letter Grade
INFO 1201 (3) Computational Reasoning 1: Expression and Media Transformation
Introduces principles of computational thinking through the manipulation, transformation and creation of media artifacts, such as images, animations, sounds, web pages, data visualizations and games. Students will be exposed to a high-level overview of how algorithms, functions and data structures are used in computer programming through a series of assignments that emphasize the use of computation as a means of creative expression.

INFO 2001 (1) Information Science Portfolio and Professional Development
Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.
Grading Basis: Letter Grade

INFO 2131 (3) Information Ecosystems
Introduces students to techniques for working with communities, organizations, and institutions in the transformative use of information. Develops students' ability to listen for (and mediate among) diverse, discordant voices and values. Employs qualitative research, design explorations, activities, and small group projects as students examine, navigate, and design for complex interactions across ecosystems.
Grading Basis: Letter Grade

INFO 2201 (3) Computational Reasoning 2: Representations of Data
Surveys techniques for representing data and expressing relationships among data, both at small scales (for example, via programmatic data structures) and at large scales (for example, in various kinds of database systems). Introduces fundamentals of algorithm analysis and the trade-offs involved in managing data using different approaches, tools and organizing principles. Requires demonstrated proficiency with introductory computer programming.
Requisites: Requires prerequisite course of INFO 1201 or CSCI 1300 or CSCI 1310 or CSCI 1200 (minimum grade C-).

INFO 2301 (3) Quantitative Reasoning for Information Science
Introduces methods for quantifying and analyzing different types of data, covering foundational concepts in discrete mathematics, probability, and predictive modeling, along with complementary computational skills to apply these concepts to real problems. Covers counting and combinatorics, logic, set theory, introductory probability, common probability distributions, regression, and model validation. Requires demonstrated proficiency with introductory computer programming.
Requisites: Requires prerequisite course of INFO 1201 or CSCI 1200 or CSCI 1300 or CSCI 1310 (all minimum grade C-).
Grading Basis: Letter Grade

INFO 3101 (3) History of Computing and Information
Focusing on two topics: the changing role of information in everyday life over time and the increasing role of information in disciplinary studies such as social science, engineering, computer science, mathematics, digital humanities. Examines information related academic disciplines, businesses, industries and technologies from multiple perspectives from the 17th century to the present.

INFO 3401 (3) Information Exploration
Teaches students how to use information to identify interesting real world problems and to generate insight. Students will learn to find, collect, assemble and organize data to inspire new questions, make predictions, generate deliverables, and work towards solutions. They will learn to appropriately apply different methods (including computational, statistical and qualitative) for exploratory data analysis in a variety of domains.
Requisites: Requires prerequisite course of INFO 2201 and INFO 2301 and INFO 1111 or INFO 1121 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)
Grading Basis: Letter Grade

INFO 3402 (3) Information Exposition
Teaches students to communicate information to a wider audience and construct stories with data across a variety of domains. Students will learn to use data for rhetorical purposes, applying visual, statistical and interpretative methods. Students will learn to think critically about ethical and social implications of using data in expository media, including identification of bias.
Requisites: Requires prerequisite course of INFO 2201 and INFO 2301 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

INFO 3501 (3) Investigations in Information Science: Open Collaboration
Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5501
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

INFO 3502 (3) Investigations in Information Science: Online Communities
Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants’ motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5502
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 3503 (3) Investigations in Information Science: Everyday Information Behavior
Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information online. Students learn to analyze the informational dimensions that occur in their everyday lives. Credit not granted for INFO 3503 and INFO 5503.
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
INFO 3504 (3) Investigations in Information Science: Digital Identity
Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. Credit not granted for INFO 3504 and INFO 5504.
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

INFO 3505 (3) Investigations in Information Learning
Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5505
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 3506 (3) Investigations in Information Science: Online Fandom
Explores and analyzes fan communities in a digital context. Through applied research, students will investigate online spaces devoted to participatory and remix culture, media fandom, and fan creation. This class will draw concepts and methods from fan studies, social computing, ethnography, data science, and sociology to drive project-based inquiry.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5506
Requisites: Restricted to students with 55-180 credits (Juniors or Seniors)

INFO 3507 (3) Investigations in Information Science: Data and the Humanities
Introduces students to foundational computing and statistical concepts for analyzing humanities data. This course discusses the influence of digitization and data on humanist inquiry and exposes students to techniques for working with data in different areas of the humanities, including literature, history, and art. The course emphasizes technical practices involved in humanist data analysis. Comfort with programming is strongly encouraged.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5507
Requisites: Restricted to students with 55-180 credits (Juniors or Seniors)

INFO 3508 (3) Investigations in Information Science: Online Communities
Brings together research on online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5508
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors)

INFO 4501 (3) Ethical and Policy Dimensions of Information, Technology and New Media
Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5601
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4502 (3) Mastery in Information Science: Information Visualization
Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5602
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4503 (3) Mastery in Information Science: Survey Research Design
Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5603
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4504 (3) Applied Machine Learning
Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5604
Requisites: Requires prerequisite courses of INFO 2201 or INFO 2301 or CSCI 2270 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).
Grading Basis: Letter Grade
INFO 4605 (3) Mastery in Information Science: Ethnographic Research in Applied Settings
Demonstrates the power of ethnography as an investigative approach that is useful in design, evaluation and question formation for information scientists across all workforce sectors. Teaches students how to be keen observers of the unusual as well as the everyday to reveal meaningful insights that elaborate information science projects. Credit not granted for INFO 4605 and INFO 5605.
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

INFO 4606 (3) Critical Technical Practice
Surveys design theory and methods that can be used to question relationships between technology, culture, and the environment. Students will discuss readings and synthesize those readings through design exercises. The course will equip students with resources for thinking more critically and creatively about design and possible future human-technology relationships.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5606, ATLS 4606, and ATLS 5606
Grading Basis: Letter Grade

INFO 4607 (3) Mastery in Information Science: Software Engineering for Data-Centered Systems
Explores design and engineering of systems for data storage and analysis. Introduces fundamental development concepts used in real-world data systems. By combining software engineering with knowledge from data science and human-centered computing, prepares students to develop systems, interpret and modify codebases, understand modern concepts for managing data at scale, and work in teams to create cutting-edge applications for consumer use.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5607
Requisites: Requires prerequisites of INFO 2201 or CSCI 2270 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)
Grading Basis: Letter Grade

INFO 4608 (3) Mastery in Information Science: Community-Based Design
Surveys techniques in cooperative design with community members as collaborators rather than subjects. Students will explore approaches such as participatory design and co-design. Students will work in teams in partnership with community stakeholders to create tools, experiences, or systems that meet the needs of communities, contribute to social change, and/or lead to advancing academic knowledge.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5608
Requisites: Restricted to students with 55-180 credits (Juniors or Seniors)

INFO 4611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design
Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5611
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4700 (3) Senior Capstone
Provides senior level INFO students an opportunity to demonstrate the culmination of their learning in the major by designing and implementing a significant information system or developing a research question, typically in response to a problem of personal interest related to or informed by their secondary area of specialization. Reinforces project planning, public presentation and ethic skills.
Requisites: Restricted to Information Science (INFO) majors only with a minimum of 90 hours.
Grading Basis: Letter Grade

INFO 4800 (1-3) Leadership Practicum in Information Science
Equips students for taking on leadership roles in the interdisciplinary context of information science. Students will learn to facilitate learning among students with diverse backgrounds and expertise, developing communication and mentoring skills and gaining exposure to a variety of learner-centered design strategies and pedagogical approaches. Enrollment is by invitation and at the discretion of the instructor.
Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.
Requisites: Restricted to Information Science (INFO) majors only.
Grading Basis: Letter Grade

INFO 4841 (1-4) Undergraduate Independent Study
Undergraduate independent study.
Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.
Requisites: Restricted to Information Science (INFO) majors only.
Grading Basis: Letter Grade

INFO 4871 (3) Special Topics
Special topics.
Repeatable: Repeatable for up to 15.00 total credit hours.
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4900 (1-3) Research Experience in Information Science
Provides research experience in information science. Students will contribute to the construction of new knowledge, helping to answer current research questions or to solve contemporary problems in the domain. Enrollment is by invitation and discretion of the advising faculty member.
Repeatable: Repeatable for up to 12.00 total credit hours.
Grading Basis: Letter Grade

INFO 4931 (1-6) Undergraduate Internship
Undergraduate internship.
Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Restricted to Information Science (INFO) majors only.
Grading Basis: Letter Grade