INFORMATION SCIENCE

Undergraduate students majoring in Information Science will explore the intersection of human values and the information technologies that influence everyday life. Topics include user experience design, big data analysis and visualization, how culture and history shape technology, ethics in machine learning, and technology for social good. Students will build a toolkit integrating design, computation and data analysis. This information science toolkit will enable students to investigate, understand, and inspire contemporary issues around our increasingly digitized life. This project-centered major prepares students for in-demand careers with a professional portfolio and implemented projects.

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)

Minors
- Data Science - Minor (catalog.colorado.edu/undergraduate/colleges-schools/media-communication-information/programs-study/information-science/data-science-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
Burke, Robin D. (https://experts.colorado.edu/display/fisid_165005) Professor; PhD, Northwestern University
Devendorf, Laura (https://experts.colorado.edu/display/fisid_158564) Assistant Professor; PhD, University of California, Berkeley
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, Lelsey A. (https://experts.colorado.edu/display/fisid_114604) Chair, Professor; PhD, University of California, Irvine
Paul, Michael J. (https://experts.colorado.edu/display/fisid_156070) Assistant Professor; PhD, Johns Hopkins University
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) Associate Chair, 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) 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.
Equivalent - Duplicate Degree Credit Not Granted: CSCI 1200
INFO 1301 (3) Statistics for Information Science
Introduces concepts and techniques for characterizing and quantifying data. Students will learn to summarize, visualize, and interpret data with descriptive statistics and will learn the foundations of statistical inference and modeling. Topics include statistical distributions and the normal distribution, hypothesis testing and statistical significance, and linear regression.
Grading Basis: Letter Grade

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 the role of information in their careers, which includes planning, analyzing, writing, and presenting. Students will develop a portfolio of their work that demonstrates their skills and knowledge in the field of information science.
Grading Basis: Letter Grade

INFO 2131 (3) Information Ecosystems
Introduces students to the role of information 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 1200 or LING 1200 or ATLS 1300 (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 LING 1200 or ATLS 1300 (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 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior)
Grading Basis: Letter Grade

INFO 3501 (3) 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. Counts as Investigations in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5501
Requisites: Requires prerequisite course of INFO 2201 and INFO 2301 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).
Grading Basis: Letter Grade

INFO 3502 (3) 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. Counts as Investigations in Information Science.
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) 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. Counts as Investigations in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5503
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade
INFO 3504 (3) 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. Counts as Investigations in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5504
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 3505 (3) Designing for Creativity and 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. Counts as Investigations in Information Science.
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) 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. Counts as Investigations in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5506
Requisites: Restricted to students with 55-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 3507 (3) 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. Counts as Investigations in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5507
Requisites: Restricted to students with 55-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 3508 (3) Personal Information Management
Explores and analyzes personal information management: the organization of our digital stuff, including course assignments, internship documents, files shared with others via the cloud, social media posts, step counts captured by smartwatches, and location traces collected by phones. In this course, students will participate in a semester-long design research project exploring ways to re-imagine how technology handles our digital stuff. Counts as Investigations in Information Science.
Requisites: Restricted to students with 55-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4001 (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 information science.
Requisites: Restricted to Information Science (INFO) majors and minors.
Grading Basis: Letter Grade

INFO 4601 (3) Ethical and Policy Dimensions of Information and Technology
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. Counts as Mastery in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5601
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4602 (3) 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. Counts as Mastery in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5602
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4603 (3) 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. Counts as Mastery in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5603
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade

INFO 4604 (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. Counts as Mastery in Information Science.
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) 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. Counts as Mastery in Information Science. Degree credit not granted for INFO 4605 and INFO 5605.
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade
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. Counts as Mastery in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5606, ATL 4606, and ATL 5606
Grading Basis: Letter Grade
INFO 4607 (3) 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. Counts as Mastery in Information Science.
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) 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. Counts as Mastery in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5608
Requisites: Restricted to students with 55-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade
INFO 4609 (3) User-Centered Design
Surveys the theoretical and practical foundations of human-computer interaction and user-centered design. Students learn theories of interaction (including cognitive, organizational, collaborative, and task-based approaches), user interface design techniques, design guidelines, and usability testing in the context of developing technology. Course content is explored through a variety of interfaces (desktop, mobile, touch, vision, audio, etc.) and contexts (personal, organizational, cross-cultural, etc.). Counts as Mastery in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5609
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade
INFO 4611 (3) 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. Counts as Mastery in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5611
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade
INFO 4613 (3) Network Science
Introduces theories and methods for analyzing relational data in social, information, and other complex networks. Students will understand the processes and theories explaining network structure and dynamics as well as develop skills analyzing and visualizing real-world network data. No math or statistics training required, but course will assume familiarity with Python. Counts as Mastery in Information Science.
Equivalent - Duplicate Degree Credit Not Granted: INFO 5613
Requisites: Requires prerequisite course of INFO 3402 (minimum grade C). Restricted to students with 55-180 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. Allows multiple enrollment in term.
Requisites: Restricted to students with 55-180 credits (Juniors or Seniors).
Grading Basis: Letter Grade
INFO 4900 (1-6) 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