

COMPUTER SCIENCE, DESIGN & JOURNALISM

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Department Office: Hitchcock Communication Arts Building, Room 209-A

The Department of Computer Science, Design and Journalism prepares students for professional careers and graduate study in fields ranging from computing to media to graphic design and film. Majors and tracks include computer science, graphic design, film making, advertising, news, and public relations. Courses emphasize the development of critical thinking, problem-solving, visual communication, and multimedia skills. In each of the majors and tracks, students gain practical knowledge and theoretical foundations while building the critical reasoning and communication skills for these fast-evolving fields. Students gain hands-on experience through research, internships, memberships in professional organizations, student media and Backpack Journalism.

Majors

- Computer Science (<http://catalog.creighton.edu/undergraduate/arts-sciences/csdj/computer-science/>)
- Journalism (<http://catalog.creighton.edu/undergraduate/arts-sciences/csdj/journalism/>)
- Graphic Design & Film (<http://catalog.creighton.edu/undergraduate/arts-sciences/csdj/graphic-design/>)

Minors

- Computer Science (<http://catalog.creighton.edu/undergraduate/arts-sciences/csdj/computer-science-minor/>)
- Graphic Design (<http://catalog.creighton.edu/undergraduate/arts-sciences/csdj/graphic-design-minor/>)
- Journalism (<http://catalog.creighton.edu/undergraduate/arts-sciences/csdj/journalism-minor/>)

Associate degrees are available to students enrolled in the College of Arts and Sciences or the College of Nursing. A candidate for an Associate in Arts or Associate in Science degree must have earned 64 semester hours of credit with a grade point average (GPA) of 2.00 or above for all courses attempted at Creighton University and 2.00 or above for all courses in the field of concentration. The Associate in Science in Paramedicine degree requires a total of 72 semester hours. Students who earn an associate degree may continue on for a bachelor's degree. All work completed in an associate degree program can be applied toward a bachelor's degree.

At least half (32) of the hours for the Associate in Science or Associate in Arts must be completed in residence at Creighton University. At least 15 semester hours in the major field must be completed at Creighton.

ASSOCIATE DEGREE REQUIREMENTS: 64 CREDITS

Degree-seeking students enrolled through the College of Arts and Sciences or College of Nursing are required to complete CPS 200: Making the Transition to College. Students who have successfully completed the RSP Culture of Collegiate life course and inter-college transfer to either the College of Arts and Sciences or College of Nursing are not required to complete this requirement.

Associate In Science (A.S.) Degree programs

Code	Title	Credits
Required Course		
CPS 200	Making the Transition to College:Strategies for Degree Completion	3

Code	Title	Credits
Magis Core Foundations:		15
Select all of the following Foundations components:		
	Contemporary Composition (3)	
	Critical Issues in Human Inquiry (3)	
	Oral Communication (1)	
	Mathematical Reasoning (2)	
	Philosophical Ideas (3)	
	The Christian Tradition (3)	

Magis Core Explorations:		5
Select 5 credits from the following. Ethics is required.		
	Understanding Natural Science (2)	
	Understanding Social Science (3)	
	Global Perspectives in History (3)	
	Literature (3)	
	Ethics (3) ^{*Required}	
	The Biblical Tradition (3)	

Major Requirements	25-31
See Major for specific requirements	
Electives	13-19
Select Electives to reach 64 credits ¹	

Total Credits	58-70
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- Computer Science (<http://catalog.creighton.edu/undergraduate/arts-sciences/csdj/as-computer-science/>)

Certificate Programs

- Computer Science Certificate (<http://catalog.creighton.edu/undergraduate/arts-sciences/csdj/computer-science-cert/>)

Courses

CSC 111. Basics of Coding. 3 credits. OD

An introduction to programming and problem-solving in which students create interactive applications and systems through project-based learning. Students will learn problem solving, software design, debugging strategies, and the foundations of computer science (data structures, procedures, and algorithms).

CSC 121. Computers and Scientific Thinking. 3 credits. FA, SP

An introduction to science and scientific reasoning from a perspective that integrates computer science and the natural sciences. Students will gain a basic understanding of computer technology and how computers and computer modeling are used in various scientific disciplines. Methods and applications from the biological sciences will be emphasized.

CSC 221. Introduction to Programming. 3 credits. FA, SP

A first course in computer programming and problem solving, with an emphasis on designing and developing solutions to real-world problems (such as system modeling, data analysis, and multimedia processing). Specific topics include algorithm development, basic control structures, simple data types and data structures.

CSC 222. Object-Oriented Programming. 3 credits. FA, SP

A second course in computer programming, emphasizing the object-oriented approach to software development. Specific topics include object-oriented design, classes and objects, encapsulation, list processing, and recursion. P. CSC 221.

CSC 321. Data Structures. 3 credits. FA

An introduction to fundamental data structures used in solving problems, including the programming and mathematical concepts required to implement and analyze data structures. Specific data structures include lists, stacks, queues, linked structures, sets, and maps. Supporting concepts include logic, proof techniques, and basic graph theory. P. Grade of "C" or better in CSC 222.

CSC 414. Computer Organization. 3 credits. SP

An introduction to the organization and design of modern computing devices. Topics include basic addressing modes, instruction formats and interpretation, I/O devices, memory organization, and microprogrammed control. P. CSC 221.

CSC 421. Algorithm Design and Analysis. 3 credits. SP

An advanced problem-solving course that focuses on the design, implementation, and analysis of algorithms. Specific algorithmic approaches include divide-and-conquer, greedy, backtracking, and dynamic programming. The connections between algorithms and data structures, such as trees and hash tables, are highlighted. P. CSC 321.

CSC 426. Data Visualization. 3 credits. SP (Same as GDE 426)

In today's world we are inundated with data. So much so that it is often overwhelming, confusing, and ultimately meaningless. By combining the principles of art, design, and statistics, Data Visualization teaches the tools and methods to harness that data and make it meaningful. It also enables clear communication and sets up the possibility for deep insights. P. GDE 324 or CSC 121.

CSC 444. Human Computer Interaction. 3 credits. OD

An introduction to human computer interaction and design thinking, including the design and prototyping of interactive technologies using the User Centered Design philosophy. Students will learn how to conduct and analyze user research, and practice the process of ideating, prototyping, and evaluating their designs.

CSC 445. Social Networks Analytics. 3 credits. OD

This course provides an introduction to graph theory, social network analysis, and data mining. Students will learn the current trends in social network research, understand the theories behind it, collect data from various sources, use social cyber forensics techniques to extract metadata, and apply what's learned to extract meaningful insights. Prereq: CSC 221.

CSC 450. Data of/by/for the People. 3 credits. SP

Data arising from and about the 24th Street Corridor is the focus of this course, which gives an overview of quantitative research methods and focuses the students experientially on planning, gathering, cleaning, and analyzing data from community stakeholders. Students will design and develop data-driven projects using programming and statistical software. Note: this course may not count toward the CSI major, minor, A.S. degree, or Certificate. P. Critical Issues in Human Inquiry or HRS 100 ; Mathematical Reasoning; Senior standing.

CSC 493. Directed Independent Readings. 1-3 credits. OD

A directed reading course investigating current topics in computer science. May be repeated for credit to a limit of six hours. P. IC.

CSC 495. Directed Independent Study. 1-3 credits. OD

A directed study course investigating current topics in computer science. May be repeated for credit to a limit of six hours. P. IC.

CSC 497. Directed Independent Research. 1-3 credits. OD

A research project under the guidance of a member of the faculty. May be repeated for credit to a limit of six hours. P. IC.

CSC 499. Directed Internship. 1-3 credits. OD

Students gain professional experience by placement in a computing company or information technology department on a part-time basis for one semester. Students will work closely with a faculty advisor to define the project, identify its academic content, and report on its results. P. IC.

CSC 525. Theory of Computation. 3 credits. OD

A study of models of computing and the theoretical limitations of computation. Specific topics include formal grammars, finite state machines, Turing machines, and computability. P. CSC 421.

CSC 533. Programming Languages. 3 credits. SP

A survey of modern languages, including their design and implementation. Specific topics include declarative programming, procedural programming, scripting, syntax and semantics, memory management, data types, and control structures. P. CSC 321.

CSC 542. Database Design and Security. 3 credits. FA

A survey of techniques for designing and implementing databases using a relational model, with an emphasis on security and data assurance. Specific topics include relational algebra, SQL, normal forms, database design, concurrency control, and error recovery. P. CSC 222.

CSC 548. Software Engineering. 3 credits. FA

A project-based course that utilizes industry-proven methodologies for the design, implementation, and management of software projects. Specific topics include team coordination, UML modeling, design specifications, version control, reusability, and testing. P or Co: CSC 321.

CSC 550. Introduction To Artificial Intelligence. 3 credits. OD

A survey of foundational concepts and current research in artificial intelligence. Specific topics include knowledge representation, search methods, expert systems, machine learning and perception, neural networks, and emergent systems. P. CSC 222.

CSC 551. Web Programming. 3 credits. FA

An advanced study of Internet and Web protocols and the integration of programming techniques with a Web interface. Both client-side and server-side programming are covered, with topics including HTML, client-side scripting, server-side programming via the Common Gateway Interface, and current development technologies. P. CSC 222 or CSC 121 and CSC 221.

CSC 581. Mobile App Development. 3 credits. SP

A project-based course that presents the fundamental concepts and techniques of mobile application development. Specific topics include modern design methodologies, mobile resource limitations, development tools, and project management. P. CSC 222.

CSC 590. Special Topics. 3 credits. OD

An in-depth examination of one or more current topics in computer science, through a combination of lecture, discussion and student presentations. P. IC.

CSC 599. Senior Capstone. 3 credits. FA

A project-based capstone course intended for computer science seniors. Each student will design, implement, and present a project that integrates computer science content from his or her major courses. Seminal papers and results in computer science will be selected and reviewed in a seminar-style setting, with emphasis on the ethical and professional responsibilities of computer scientists. P. CSI major; Ethics course; Oral Communication course.

DSC 365. Introduction to Data Science. 3 credits.

Intro to statistical data science, using computing tools to gather, manage and analyze large and complex data sets. Topics include data wrangling and formatting, web scraping, data analysis, statistical modeling techniques, text mining and language processing. Satisfies Magis Core Designated Technology. P. Mathematical Reasoning; CSC 121 or CSC 221 or MTH 360 or MTH 361.

DSC 366. Machine Learning. 3 credits.

Introduction to machine and statistical learning techniques. Topics include supervised learning (regression models, kernel smoothers), unsupervised learning (clustering or principal component analysis), shrinkage models, additive models, and neural networks. P. MTH 360 or MTH 361 or another introductory statistics course with Instructor Consent; DSC 365.

DSC 599. Data Science Senior Capstone. 3 credits.

This project based capstone is intended for data science seniors. Students will complete a semester-long project that draws on the skills learned in all three cores of the major. Students will also learn about data ethics, interacting with big data, and develop the professional skills necessary for data scientists. Satisfies Magis Designation: Ethics, Oral Communication, Written Communication. P. Ethics, Oral Communication, Contemporary Compositions, Sr. standing, Data Science Major.

JRM 215. Media Literacy. 3 credits. FA, SP (Magis: Understand Soc Sci; Designated Technology)

This introductory course explores the impact of media, digital communication, and technology on society. Students will analyze the fundamental concepts and questions connected to media literacy and learn how to critically apply those skills in their everyday lives. Students will also learn how technological changes continue to shape the future of mass communications and will explore various concepts including fake news, attention economy, online civic reasoning, data visualization, and cyber security/privacy. Satisfies Magis Understanding Social Science, designated Technology course.

JRM 315. Public Relations and Advertising Principles. 3 credits. FA

This is a collaborative, team-taught class that will incorporate half a semester each of PR Principles and Advertising Principles. In both you will learn about fundamental principles of persuasion, targeting, advocacy work and how these two distinct but related fields work with audiences.

JRM 319. Media Writing. 3 credits. FA, SP, SU

Students learn basic news writing forms and techniques and develop their interviewing and writing skills in gathering and writing news and feature stories for the student newspaper. The course also introduces students to ethical, legal and other issues surrounding the role of media in a democratic society. P. One Magis Core Contemporary Composition course.

JRM 320. Professional Writing. 3 credits. FA

A course that teaches students to apply their writing and communication skills to professional formats such as executive summaries, power point presentations, abstracts of technical articles, professional proposals, copy for posters and copy for web pages. Course work will include oral presentations and integration of writing and graphics. P. Contemporary Composition course.

JRM 321. Advanced Reporting. 3 credits. OD

The advanced course builds on skills and concepts developed in JRM 319, Media Writing. Students research and write in-depth news articles for publication in campus media and beyond, focusing on specialized forms of reporting about government, business and politics. The course also emphasizes using computer tools, documents, data collection and analysis in the reporting. P. JRM 319.

JRM 322. Feature Writing. 3 credits. OD

The course explores the art of writing numerous types of features for newspapers and magazines including personality profiles, in-depth examinations of issues and problems, reviews, columns, editorials and humor. Course will stress research, writing and analytical skill development. Students also learn free-lance writing techniques and methods. P. JRM 319 or IC.

JRM 326. Sportswriting. 3 credits. OD

This in-depth course in the art of sportswriting provides students with experience in covering sports. The topics include how to interview coaches and players, how to obtain and report on sports statistics and how to write a variety of sports features incorporation multimedia. P. JRM 319.

JRM 327. Social Media. 3 credits. FA

This course explores the development, art and practice of writing, editing and producing social media content over a range of platforms and networks in news, public relations and advertising. The course also will examine ethical and legal aspects of social media and its role in social justice.

JRM 331. Editing. 3 credits. FA

The course introduces students to the fundamentals of preparing copy for publication by emphasizing grammar, punctuation, style, consistency, clarity and accuracy. Students learn to work with writers, to write headlines and captions, to develop infographics and to be aware of ethical, legal and taste considerations when editing. P. JRM 319.

JRM 339. Global Case Studies. 3 credits. SP

The course explores stakeholder engagement and stakeholder management in a variety of disciplines, fields, and cultural contexts. Through case studies and scholarly research, students will investigate how leaders can develop their intercultural skills to foster optimal engagement and understanding in a global society. P. Understanding Social Science.

JRM 341. Public Relations Writing. 3 credits. FA (Magis: Written Communication)

The course offers an in-depth examination and hands-on experience in the writing of various public relations formats including direct mail pieces, brochures, news releases, thought leadership blogs, speeches, grants and social media/website content. Students will also develop their editing skills. Satisfies Magis designated Written Communication course. P. Contemporary Composition, Sophomore standing or IC.

JRM 347. Media Strategy. 3 credits. FA

This course provides integrated and comprehensive experiences in advertising decision making. Experience gained in advertising principles, and advertising media writing is culminated in planning, executing and proposing a comprehensive advertising campaign. Working in teams, students will approach and solve advertising problems as an agency would for a client. May be repeated up to three times. P. JRM 315 or IC.

JRM 365. International Mass Communications. 3 credits. OD

The course examines the role of the mass media in an era of globalization and mass media's impact on societies throughout the world, emphasizing the issue of freedom of expression and of the press. The countries studied reflect areas of special contemporary interest.

JRM 419. Online Storytelling. 3 credits. SP

This course provides vital digital skills to future journalism and public relations professionals. As communication shifts online and to mobile platforms, this course places an emphasis on developing familiarity with multiple platforms and storytelling genres. Students will also learn the dynamics of data in augmenting storytelling and behavior tracking audience. P. JRM 319 OR JRM 320.

JRM 433. Advertising Copywriting and Design. 3 credits. SP

The course explores techniques in writing advertising copy for all media using practical assignments. P. JRM 315.

JRM 435. History of American Mass Media. 3 credits. SP

The course explores the history of mass communication and mass media in America and its role in society, from the forerunners of the newspaper to current trends in digital media. Students will learn about the history of press freedoms and will explore how media history and American political and social history are intertwined. P. Critical Issues in Human Inquiry; Junior or Senior Standing.

JRM 438. Media Ethics and Law. 3 credits. SP

Using numerous case studies, the ethical principles of media practice are explored, in addition to the legal principles of defamation, privacy, copyright, and trademark laws. First Amendment moral and legal issues are explored also. P. Ethics course.

JRM 440. Media Research. 3 credits. FA, SP

This course is designed to teach students to conduct or understand research methods that are often used in the mass communication industry. Discussion covers and applies mass communication theories, sampling methodologies, statistical analysis, and interpretation of data. The course also introduces students to qualitative research methods common in mass communication research. P. Mathematical Reasoning course; Junior standing.

JRM 445. Public Relations Campaigns. 3 credits. SP

This course provides comprehensive insights into public relations decision making. Experiences gained in the class will help students execute an integrated public relations campaign. Students will work in teams as they conduct a public relations audit and develop a comprehensive public relations plan for a local or national non-profit client. Students will also learn the fundamentals of public relations event planning and public relations advocacy. Course may be taken twice for a total of 6 credits. Prereq: JRM 315 or MKT 377 or Instructor Consent.

JRM 455. Projects in Communication. 1-3 credits. FA, SP, SU (Same as GDE 455)

Students develop a project in any of the mass media that is approved by a faculty member. The course may be repeated until a maximum of six credit hours have been accrued. Graded Satisfactory/Unsatisfactory. P. IC.

JRM 477. Advanced News Production. 1-3 credits. FA, SP

Students gain experience by working for one of the department's student media including The Creightonian or Creightonian Online. May be repeated for up to nine credit hours. P. IC.

JRM 479. Graphic Design Internship. 1-3 credits.

Students will gain professional experience in graphic design through working in supervised graphic design jobs. Graded Satisfactory/Unsatisfactory. P. GDE 380 and IC.

JRM 481. Broadcast and Video Internship. 1-3 credits.

Students gain professional experience through working for a radio, television or cable organization on a part-time basis for a semester or during an interterm period on a full-time basis. Graded Satisfactory/Unsatisfactory. P. IC.

JRM 483. Public Relations Internship. 1-3 credits. FA, SP, SU

Students gain professional experience by placement in a public relations department or agency on a part-time basis for one semester (or appropriate period during summer or interterm periods on either a full- or part-time basis) to learn how particular problems in public relations are handled and the methods used by that department or agency to communicate with its various publics. May be repeated. Graded Satisfactory/Unsatisfactory. P. IC.

JRM 485. News Internship. 1-3 credits. FA, SP, SU

Students gain professional experience with placement in news medium or agency on a part-time basis for one semester (or appropriate period during summer or interterm periods on either a full- or part-time basis) to gain practical experience in news gathering, writing and editing. May be repeated. Graded Satisfactory/Unsatisfactory. P. IC.

JRM 487. Advertising Internship. 1-3 credits. FA, SP, SU

Students gain professional experience by placement in a communications medium or agency on a part-time basis for one semester (or appropriate period during summer or interterm periods on either a full- or part-time basis) to gain practical experience in the procedures and functions of planning, preparing, placing and selling advertising messages and materials. May be repeated. Graded Satisfactory/Unsatisfactory. P. IC.

JRM 493. Directed Independent Readings. 1-3 credits. FA, SP, SU (Same as GDE 493)

Students work with a faculty member who agrees to supervise the directed independent readings. May be repeated until a maximum of six credit hours has been accrued. P. IC.

JRM 529. Law of Mass Communication. 3 credits. FA, SU

The course examines the legal limitations and privileges affecting publishing and broadcasting including libel, copyright, constitutional guarantees and restrictions on freedom of the press, the FCC, FTC, etc. P. Jr. stdg.

JRM 599. Senior Capstone: Entrepreneurial Media. 3 credits. FA

This project-based capstone is for journalism seniors in the news, advertising, public relations tracks. The course explores entrepreneurship and innovation in a media landscape that is constantly evolving. The course focuses on concepts of entrepreneurship and new media business models. Student research, design, and pitch an entrepreneurial idea that integrates content from their major courses with new content on entrepreneurship. P. Senior Standing; Journalism majors; Oral Communication course.

JRM 999. Upper Level JRM Transfer Cred. 1-21 credits.