

# TECHNOLOGY, MEDIA AND SOCIETY

ATLAS graduate studies in technology, media and society are highly interdisciplinary. The doctoral program caters to self-motivated inventors and investigators whose interests fall outside the scope of traditional disciplinary programs. Students admitted to the PhD program hold a wide range of degrees, including industrial design, electrical engineering, education, journalism, music, computer science, art history, physics and library science.

Attracting similarly diverse students, the master's program includes tracks in creative technologies and design (CTD), and information and communication technology for development (ICTD). The studio-based CTD track invites student artists, designers, engineers and scientists to blend technical skills with creative exploration to realize their creative visions, preparing them for a wide gamut of careers in design, technology and the creative arts. The related ICTD track develops students' technical skills, critical thinking and creative problem solving as they seek to address needs such as access, social equity, public policy and sustainability in developing countries and underserved domestic communities.

For more information, visit the institute's Technology, Media and Society Graduate Programs (<http://atlas.colorado.edu/programs>) webpage.

Course code for this program is ATLS.

## Professional Master's Degree

- Technology, Media and Society - Master of Science (MS) ([catalog.colorado.edu/graduate/colleges-schools/engineering-applied-science/programs-study/technology-media-society/technology-media-society-master-science-ms](http://catalog.colorado.edu/graduate/colleges-schools/engineering-applied-science/programs-study/technology-media-society/technology-media-society-master-science-ms))

## Doctoral Degree

- Technology, Media and Society - Doctor of Philosophy (PhD) ([catalog.colorado.edu/graduate/colleges-schools/engineering-applied-science/programs-study/technology-media-society/technology-media-society-doctor-philosophy-phd](http://catalog.colorado.edu/graduate/colleges-schools/engineering-applied-science/programs-study/technology-media-society/technology-media-society-doctor-philosophy-phd))

## 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.

Alistar, Mirela  
Assistant Professor; PhD, Danmarks Tekniske Universitet (Denmark)

Bethancourt, Matthew R. ([https://experts.colorado.edu/display/fisid\\_156489](https://experts.colorado.edu/display/fisid_156489))  
Senior Instructor, Faculty Director; MFA, Parsons School of Design

Black, Jonathan  
Lecturer

Braha, Daniel  
Lecturer; BA, Arizona State University

Bruns, Annie  
Instructor; PhD, Northwestern University

Bruns, Carson J. ([https://experts.colorado.edu/display/fisid\\_159851](https://experts.colorado.edu/display/fisid_159851))  
Assistant Professor; PhD, Northwestern University

Carruth, Christopher ([https://experts.colorado.edu/display/fisid\\_153706](https://experts.colorado.edu/display/fisid_153706))  
Instructor; MS, University of Colorado Boulder

Devendorf, Laura ([https://experts.colorado.edu/display/fisid\\_158564](https://experts.colorado.edu/display/fisid_158564))  
Assistant Professor; PhD, University of California, Berkeley

Do, Ellen Yi-Luen ([https://experts.colorado.edu/display/fisid\\_159925](https://experts.colorado.edu/display/fisid_159925))  
Professor; PhD, Georgia Institute of Technology

Dupré, Jill Van Matre ([https://experts.colorado.edu/display/fisid\\_144395](https://experts.colorado.edu/display/fisid_144395))  
Scholar in Residence, Associate Faculty Director; JD, University of Colorado Boulder

Gross, Mark D. ([https://experts.colorado.edu/display/fisid\\_100095](https://experts.colorado.edu/display/fisid_100095))  
Professor, Institute Director; PhD, Massachusetts Institute of Technology

Hales, Ian W. ([https://experts.colorado.edu/display/fisid\\_134701](https://experts.colorado.edu/display/fisid_134701))  
Instructor; MS, University of Denver

Hein, Arielle ([https://experts.colorado.edu/display/fisid\\_157379](https://experts.colorado.edu/display/fisid_157379))  
Instructor; MPS, New York University

Hoth, Kevin J. ([https://experts.colorado.edu/display/fisid\\_149219](https://experts.colorado.edu/display/fisid_149219))  
Instructor; MFA, University of Washington

Leithinger, Daniel ([https://experts.colorado.edu/display/fisid\\_163356](https://experts.colorado.edu/display/fisid_163356))  
Assistant Professor; PhD, Massachusetts Institute of Technology

Pierce, Aileen J. ([https://experts.colorado.edu/display/fisid\\_134704](https://experts.colorado.edu/display/fisid_134704))  
Senior Instructor, Associate Faculty Director; BS, Carnegie Mellon University

Rankin, Daniel  
Instructor; MS, University of Colorado Boulder

Schaal, David A. ([https://experts.colorado.edu/display/fisid\\_114824](https://experts.colorado.edu/display/fisid_114824))  
Instructor; MFA, University of Colorado Boulder

Seltzer, Wayne  
Lecturer; MA, Massachusetts Institute of Technology

Shapiro, Ben ([https://experts.colorado.edu/display/fisid\\_156418](https://experts.colorado.edu/display/fisid_156418))  
Assistant Professor; PhD, Northwestern University

Swanson, Joel E. ([https://experts.colorado.edu/display/fisid\\_134311](https://experts.colorado.edu/display/fisid_134311))  
Assistant Professor; MFA, University of California, San Diego

Szafir, Daniel J. ([https://experts.colorado.edu/display/fisid\\_156420](https://experts.colorado.edu/display/fisid_156420))  
Assistant Professor; PhD, University of Wisconsin–Madison

Theodore, Michael ([https://experts.colorado.edu/display/fisid\\_113318](https://experts.colorado.edu/display/fisid_113318))  
Associate Professor; PhD, University of California, San Diego

## Courses

### ATLS 5040 (3) Game Design

Introduces students to game design, development, history, theory and culture through readings, discussion, game analysis and the iterative design process of non-digital games.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4040

**Requisites:** Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to the ATLAS (PATL) student group only.

**ATLS 5120 (3) Mobile Application Development**

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4120

**Grading Basis:** Letter Grade

**ATLS 5130 (3) Typography**

This course is an advanced investigation of typography for visual communication and expression. Emphasis is placed on the analysis of meaning as conveyed through materials, technology, and design. Projects are experimental and are designed to challenge you to expand your understanding of the function of typography in communication, design, art, and culture.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4130

**Requisites:** Restricted to graduate students only.

**ATLS 5140 (3) Game Development**

Builds on concepts and processes learned in ATLS 4040/5040. Reinforces game design principles through analysis and discussion of digital games, and introduces students to key practices in the development of digital game experiences, including game flow, mechanics, 2D and 3D graphics, and artificial intelligence.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4140

**ATLS 5150 (1) Managing Effectively in a Changing Telecommunications Environment**

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

**Equivalent - Duplicate Degree Credit Not Granted:** TLEN 5150

**Requisites:** Restricted to CYBR/TLEN graduate students.

**ATLS 5151 (3) Flow Visualization**

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

**Equivalent - Duplicate Degree Credit Not Granted:** CINE 4200, MCEN 4151, MCEN 5151, ATLS 4151 and ARTF 5200

**ATLS 5210 (3) Global Development I**

Introduces students to the theories and policy of international development. Examines the role of multilateral agencies, foundations, aid organizations, corporate entities and academia in development as both an industry and a research field. Focuses on development movements and their outcomes, the inter-related nature of development and its effect on policies and programs, and critiques.

**Requisites:** Restricted to graduate students only.

**ATLS 5214 (3) Big Data Architecture**

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4214

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ATLS 5220 (3) Global Development II**

Explores the impact of economic, geographical and social/cultural conditions on development outcomes through standalone course components taught by subject matter experts in region and in residency at ATLAS. Components may include, but are not limited to, development economics, environmental sustainability, public health, climate change, globalization and migration, religion, and gender as these broad themes relate to development.

**Requisites:** Requires prerequisite courses of ATLS 5210 (minimum grade D-). Restricted to graduate students only.

**ATLS 5230 (3) Case Studies in Information and Communication Technology for Development**

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4230

**Requisites:** Restricted to graduate students only.

**ATLS 5240 (3) Information and Communication Technology for Development Laboratory**

Prepares students for the semester-long practicum. Students work in teams to design ICTD interventions that address unique socio-economic and environmental development issues. Teams will design a variety of ICTD interventions, including telehealth and distance education programs, communication networks, and pro-development ICTD policies. Topics will be chosen by teams and guided by program faculty and external domain experts.

**Requisites:** Requires prerequisite courses of ATLS 5230 (minimum grade D-). Restricted to graduate students only.

**ATLS 5250 (3) Fieldwork Methods for ICTD Practitioners**

Introduces methods and models that can be employed in ICTD program development and deployment. Examines the applications of participatory research, value-centric design, program scale, cross-disciplinary work, and appropriate monitoring and evaluation. The goal is to build student confidence around existing evaluation toolkits and methods, while advancing multi-method approaches to designing and analyzing ICTD initiatives.

**Requisites:** Restricted to graduate students only.

**ATLS 5320 (3) Mobile Application Development: Advanced Topics**

Explores advanced topics in mobile application design and development, including examining different approaches to information design and the various user interaction models associated with them. Understanding how data is structured, accessed, stored and flows through apps is a core theme of the course. Explores the interaction with external data sources and storage models.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4320

**Requisites:** Requires prerequisite course of ATLS 5120 (minimum grade C).

**Grading Basis:** Letter Grade

**ATLS 5380 (3) Future of Video: Technology, Policy, and Economics**

Examines the issues that have been created by the shift from analog to digital technologies, the shift from narrowband/wideband systems to broadband systems, and the shift to converged networks (i.e. networks able to convey voice, data, image and video traffic on a common platform) based upon packet switching and Internet Protocol (IP) suite.

**Equivalent - Duplicate Degree Credit Not Granted:** CYBR 5480

**Requisites:** Requires prerequisite of CYBR 5001 (minimum grade C-). Restricted to CYBR graduate students.

**ATLS 5402 (3) Research Methods in Human-Robot Interaction**

Introduces students to the field of human-robot interaction (HRI). Covers HRI theory, principles, methodologies, and applications with links to robotics, artificial intelligence, human factors, human-computer interaction, design, cognitive psychology, education and other domains. Coursework includes readings from state-of-the-art in HRI research, team exercises and problem-solving sessions, and implementation and evaluation of a human-robot interaction systems for specific applications.

**Equivalent - Duplicate Degree Credit Not Granted:** CSCI 5402

**Requisites:** Restricted to graduate students only.

**ATLS 5420 (3) Professional Seminar: Business of Creativity**

This course was designed specifically to prepare students to make the most of their time in the CTD Master's Program, and to prepare them for a career within the creative technology and design professional landscape. The course helps students identify career goals and mentors, and helps them position themselves for industry through course-selection, portfolio development, and projects. There is also a survey element to the course which exposes students to creative technology professionals who discuss their career paths, offer advice, and provide insight into their individual design process.

**Grading Basis:** Letter Grade

**ATLS 5519 (1-3) Advanced Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 5529 (1-3) Advanced Special Topics: Critical Perspectives in Technology**

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4529

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ATLS 5606 (3) Mastery in Information Science: 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:** ATLS 4606, INFO 4606 and INFO 5606

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**ATLS 5610 (6) Startup Practicum**

Presumes that entrepreneurship can be learned through the conception, build, and launch of an original product or service by student teams within a single semester. Immerses students in the daily leadership and innovation challenges of the startup environment and serves as a clinic in thinking, decision making and mental agility that will benefit any area of business—not just startups.

**Requisites:** Restricted to graduate students only.

**ATLS 5620 (3) User Centered Design 1**

Emphasizes that user-centered design is the first and primary consideration in the design process. UCD teaches how to design successful interactions from research into users' behaviors, attitudes and expectations via three key elements to designing successful user experiences: 1) Listen, Observe, and Research; 2) Concept and Design for Your Users; 3) Deliver/Launch.

**Requisites:** Restricted to graduate students only.

**ATLS 5630 (3) Web Front-End Development**

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, jQuery, HTML5, APIs and user interface design methods to create interactive web applications. Individual and group projects will include animations, games, interactive narratives and web applications.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4630

**Requisites:** Restricted to graduate students only.

**ATLS 5640 (4) Design Thinking**

Explores design thinking and how it can be applied conceptually and practically to innovation in areas as diverse as business organization and product development to topics and areas including but not limited to, story, design, UX, interaction design, communication strategy and presentation. Fast-paced, project-based, and immersive, students will work in small teams to discover solutions to real-world problems.

**Requisites:** Restricted to graduate students only.

**ATLS 5650 (3) Introduction to Programming**

Provides a hands-on introduction to programming logic, environments, and execution using Ruby as the primary programming language. Covers basic programming principle, syntax, design patterns, and best industry practices while focusing on developing elegant, problem-solving skills through code.

**Requisites:** Restricted to graduate students only.

**ATLS 5660 (3) Creative Code**

Exposes students to front-end, web-based design and development processes and best practices. WordPress will be used as the back end CMS. Students will learn how to design and develop using WordPress as a framework. At the end of the semester, students will present a final project to illustrate what they have learned and the logic of their build.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites: exposure to HTML, CSS, JavaScript, PHP and MySQL and previous experience with WordPress for blogging and/or content publication.

**ATLS 5670 (3) Content Strategies**

Experiments with different frameworks on how to combine messaging with creative to communicate complex ideas, brand story, product, and finally measure success. Gain experience and expertise with the various content types and channels, with an understanding of how to apply them and the capabilities to do so in solving creative and business problems.

**Requisites:** Restricted to graduate students only.

**ATLS 5680 (3) Creative Tech Studio**

Emphasizes fundamentally, theoretically, and practically that technology and creativity are not opposing disciplines but rather a dynamic and complementary blending of idea and execution that is iterative and evolving through the dynamic exchange and interaction of ideas and tools. Each Studio will offer a different conceptual challenge, such as using technology to bridge physical and digital environments, game design, or storytelling.

**Repeatable:** Repeatable for up to 12.00 total credit hours.

**Grading Basis:** Letter Grade

**ATLS 5720 (3) User-Centered Design 2**

Expands on techniques and opportunities presented in User-Centered Design 1 with a deeper dive into research and prototyping practices as means to insight into user desires and preference, adoption, and execution of product and branded experiences in a variety of contexts and locations within the global experience economy.

**ATLS 5730 (3) Front-End Development 2**

Requires that students are proficient in front-end environment and ready for advanced front-end development using these tools - HTML 5, CSS3, JS - on weekly projects, a mid-term project, and a final project. This course develops more robust and elegant uses of the semantic use of elements as well as the benefits of using standards-based, valid code, CSS efficiencies, and JS and its libraries.

**ATLS 5740 (3) Design Thinking 2**

Presents visual thinking as a complex process that can be supported in every stage using specific design techniques. Provides practical, task-oriented information for designers and software developers charged with design responsibilities, including examples of integrated text and full-color data stories, all of which are robust in principles of "active vision," viewing graphic designs as cognitive tools.

**ATLS 5809 (3) Computer Animation**

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4809 and CSCI 4809 and CSCI 5809

**Requisites:** Restricted to graduate students only.

**ATLS 5880 (3) Interactive Machine Learning for Customizable and Expressive Interfaces**

Introduces students to techniques for applying machine learning in the development of customizable human-computer interfaces. Students will learn to process a wide variety of input data (e.g. video and accelerometer streams), using different machine learning algorithms to detect semantically meaningful events that can afford the construction of new interactive systems. They will complete substantial projections within the domains of assistive or creative technologies. Does not fulfill Breadth Requirement for CSEN graduate students.

**Equivalent - Duplicate Degree Credit Not Granted:** ATLS 4889, CSCI 4889 and CSCI 5880

**Requisites:** Requires prereqs (CSCI 3022 or APPM 4570 or APPM 3570 or APPM 4520 or CVEN 3227 or MATH 3510 or MATH 4510 or ECEN 3810 or ECON 3818 or MCEN 4120) (CSCI 3002 or CSCI 3202 or CSCI 4448) all min grade C-. Restricted to grad students in the ATLAS program.

**Grading Basis:** Letter Grade

**ATLS 5900 (1-6) Masters Level Independent Study**

Provides opportunities for independent study and research at the Masters level. Students work on research project guided by faculty.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 6519 (1-3) Advanced Special Topics in Technology, Arts, and Media**

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

**Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

**ATLS 6910 (3-6) Information and Communication Technology for Development Practicum**

This practicum allows MS-ICTD students to synthesize what they have learned and test their readiness for a career in ICTD. Practicum assignments are arranged under the supervision of the MS-ICTD Program Director and involve work with a non-governmental organization, development agency or technology/policy entity. Successful completion is required for graduation from the MS-ICTD Program.

**Requisites:** Requires prerequisite courses of ATLS 5210 and ATLS 5220 and ATLS 5230 and ATLS 5240 and ATLS 5250 (all minimum grade D-).

**ATLS 7000 (1) ATLAS Seminar**

This student/faculty seminar critically examines issues in technology, media and society from the multiple interdisciplinary perspective of the gathered participants. Topics may include: IT and business, security, ethics, globalization, digital divide, IT and education, human computer interaction and others. Department consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**ATLS 7800 (2) Online Course Design for the Foreign Languages**

Learn about the challenges and affordances of designing online foreign languages courses. Read research articles and book chapters pertaining to instructional design issues and online teaching strategies. Experiment with the latest forms of educational technologies. Students enrolled in the course will design and teach a two-week online language course. Department enforced prerequisite: two years of language teaching experience at the college level.

**Grading Basis:** Pass/Fail

**ATLS 7900 (1-6) Doctoral Level Independent Study**

Provides opportunities for independent study and research at the Doctoral level. Students perform independent research under faculty supervision.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Atlas (ATLS) graduate students only.

**ATLS 8990 (1-10) Doctoral Dissertation**

Approved research conducted under the supervision of members of the graduate faculty. Investigates some specialized topic or field in the area of interdisciplinary information and communication technology. All doctoral students must register for at least 30 hours of dissertation credit as part of the requirement for the ATLAS doctoral degree.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to Atlas (ATLS) graduate students only.