ATLAS (ATLS)

Courses

ATLS 1100 (3) Design Foundations
Introduces foundational principles, practices and methods of design. Emphasizes design as an expressive and creative problem solving tool. This course engages with design from a broad perspective including visual, computational, physical and auditory design practices. Through lectures, discussions and creative projects, students will gain a familiarity with the diverse applications of creative technology through design.
Requisites: Restricted to Creative Technology and Design majors (TMEN) and (MTAM) minors and IUT On Track applicants.

ATLS 1300 (4) Computational Foundations 1
Explores computation as a powerful tool for creative design and expression in a project-based studio environment. Students learn the fundamentals of creative coding, computational thinking, and object-oriented programming. Hands-on topics include generative art and design, interactivity, animation, and visualization.
Requisites: Restricted to Creative Technology and Design majors (TMEN) and (MTAM) minors and IUT On Track applicants.

ATLS 1350 (3) Computational Foundations for Non-Majors
Explores computation as a powerful tool for creative design and expression in a project-based studio environment. Students learn the fundamentals of creative coding, computational thinking, and object-oriented programming. Hands-on topics include generative art and design, interactivity, animation, and visualization.

ATLS 2000 (3) The Meaning of Information Technology
A survey of the mutual influence of technology, media, and society. Equips students with an understanding of technological transformations in interpersonal, organizational, and mass communication. Emphasis is on the technological, social and political changes that underlie the movement toward a digital society. As such, the class acts as a survey of various technologies and their relationship to socio-political issues. We not only address ¿how does it work¿ and ¿where does this come from¿ but ¿why is it here¿ and ¿how does it impact us as individuals and as a society¿.
Requisites: Restricted to Creative Technology and Design (TMEN) majors and (MTAM) minors, IDEN majors and EMEN majors and IUT On Track applicants.

ATLS 2036 (3) Introduction to Media Studies in the Humanities
Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant ready and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.
Equivalent - Duplicate Degree Credit Not Granted: AHUM 2036 and ENGL 2036
Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Restricted to Creative Technology Design (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.
Additional Information: Arts Sci Gen Ed: Distribution-Arts Humanities

ATLS 2100 (3) Image
Introduces techniques, technologies and concepts of digital image making and manipulation through lectures, projects and critiques. Focuses on digital photography, digital animation and digital video as a means to formal and expressive ends. This course also contextualizes practices and methodologies of digital imaging with historical and critical perspectives.
Requisites: Requires prereq courses of ATLS 1100 and ATLS 1300 or INFO 1701 or CSCI 1300 and prereq or coreq course of ATLS 2000 or ENES 2020 (all min grade C-). Restricted to Creative Tech Design (TMEN) mjrs (MTAM) minors or IDEN mjrs IUT On Track applicants
Grading Basis: Letter Grade

ATLS 2200 (3) Web
Introduces techniques, technologies and concepts of web design and development through lectures, projects and critiques. Focuses technically on HTML, CSS and JavaScript as the primary web technologies. Contextualizes the technical and societal implications of the Internet through historical and critical perspectives.
Requisites: Requires prereq courses ATLS 1100 ATLS 1300 or INFO 1701 or CSCI 1300 (all min grade C-). Requires prereq or coreq course ATLS 2000 or HUEN 2020 or ENES 2020. Restricted to TMEN majors MTAM minors or IDEN majors or IUT On Track applicants.

ATLS 2270 (4) Computational Foundations 2
Builds on the fundamental programming concepts introduced in ATLS 1300. Students will learn to write sophisticated programs that employ efficient means of representing and manipulating information. They will learn to analyze algorithms in terms of complexity, gain an understanding of fundamental data structures (lists, stacks, queues, trees), and acquire practical experience implementing algorithms to solve common problems (sorting, graph traversal).
Requisites: Requires prerequisite courses of ATLS 1300 or CSCI 1300 or INFO 1701 or ASEN 1320 (all minimum grade C-). Requires prerequisite or corequisite course ATLS 2000 or HUEN 2020 or ENES 2020. Restricted to TMEN) majors MTAM minors or IUT On Track applicant

ATLS 2300 (3) Text
Introduces technologies, terminology and histories related to the design of text within digital and analogue media. Students will learn the fundamentals of design, typography and layout through lectures, projects and critiques. The curriculum surveys significant theoretical perspectives, historical periods and significant practitioners that influence the practice of typographic design.
Requisites: Requires prereq courses ATLS 1100 ATLS 1300 or INFO 1701 or CSCI 1300 (all min grade C-). Requires prereq or coreq course ATLS 2000 or HUEN 2020 or ENES 2020. Restricted to TMEN majors MTAM minors or IDEN majors or IUT On Track applicants.

ATLS 2519 (1-4) Special Topics in Creative Technology and Design
Analyzes special interest areas of creative technology and design research and practice.
Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.
Requisites: Restricted to Creative Technology Design (TMEN) majors and (MTAM) minors, or the ATLAS (PATL) student group only.
Grading Basis: Letter Grade

ATLS 3040 (3) Introduction to Games and Play
Introduces students to foundational concepts, culture, history, and creation of games and playful experiences. Through readings, playing games, and completing design exercises, students will learn to analyze how various formal elements of play function to make successful games.
Requisites: Requires prerequisite or corequisite course of ATLS 1100 (minimum grade C-).

ATLS 3100 (3) Form
Teaches the fundamentals of 3D modeling, 3D animation and 3D printing / rapid prototyping from a conceptual and sculptural perspective. Through topical lectures, technical demonstrations and creative projects the course will introduce students to the potentials of thinking and working within 3-dimensional spaces.
Requisites: Requires prereq courses of ATLS 1100 and ATLS 1300 or INFO 1701 or CSCI 1200 or CSCI 1300 or CSCI 1320 (all min grade C-). Requires prereq or coreq course of ATLS 2000 or HUEN 2020 or ENES 2020. Restricted to TMEN, IDEN, AMEN, EPEN majors.

ATLS 3110 (3) Motion Design
An animation-based projects course that advances student understanding of motion design in today's culture. Through active production and critical analysis, students will create new media projects and critically examine the history, social implications, and impacts of these forms of mass media.
Requisites: Requires prerequisite course of ATLS 2100 (minimum grade C-).

ATLS 3120 (3) Creative Web Development
An Internet-based projects course that advances student understanding of Internet culture. Through active production and critical analysis, students will explore their individual roles in the digital landscape and critically examine the social implications and impacts of digital communities.
Requisites: Requires prerequisite courses of ATLS 2000 and ATLS 2200 (all minimum grade C-). Restricted to Creative Technology and Design (TMEN) majors and (MTAM) minors.

ATLS 3150 (3) Universal Design for Digital Media
Focusing on the concepts of universal design and Web Standards, this course will address issues that occur at the nexus of web standards, Universal Design and the needs of persons with disabilities. Students will gain the expertise and skills to create media and web sites which are accessible, usable and effective for all users and device platforms.
Equivalent - Duplicate Degree Credit Not Granted: CSCI 3150
Requisites: Requires prerequisite course of ATLS 1300 or CSCI 1300 (minimum grade C-).
Recommended: Prerequisite some knowledge of creating web pages with either direct HTML coding or with web design software.

ATLS 3173 (3) Creative Climate Communication
We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.
Equivalent - Duplicate Degree Credit Not Granted: ENVS 3173 and THTR 4173
Recommended: Prerequisite ENVS 1000.
Additional Information: Arts Sci Gen Ed: Distribution-Arts Humanities Arts Sci Gen Ed: Distribution-Social Sciences

ATLS 3200 (3) Sound
Introduces techniques, technologies and concepts of digital sound through lectures, projects and critiques. Focuses technically on digital sound creation, production, synthesis and interactivity. Explores various approaches to digital sound production through historical and conceptual perspectives.
Requisites: Requires prereq courses of ATLS 1100 and ATLS 1300 or INFO 1701 or CSCI 1200 or CSCI 1300 or CSCI 1320 (all min grade C-). Requires prereq or coreq course of ATLS 2000 or HUEN 2020 or ENES 2020. Restricted to TMEN, IDEN, AMEN, EPEN majors.

ATLS 3300 (3) Object
Introduces the fundamentals of physical computing. This class is an exploration of computing that starts from the perspective that humans are fundamentally physical beings. Students will design projects that interact with humans and the physical world and will learn to integrate sensors, motors, and simple electronics into creative projects. Projects will include interactive installations, art projects, games, and audio controllers.
Requisites: Requires prereq courses of ATLS 1100 ATLS 1300 or INFO 1701 or CSCI 1200 or CSCI 1300 or CSCI 1320 or ASEN 1320 (all min grade C-). Requires prereq or coreq course of ATLS 2000 or HUEN 2020 or ENES 2020 (all min grade C-). Restricted to CTD (TMEN) mjr
Grading Basis: Letter Grade

ATLS 3500 (1-3) Client Projects in Creative Technology and Design
Allows undergraduate students to work on collaborative projects with faculty and with external organizations under faculty supervision. Focuses on teamwork, conceptual planning, technical design and development and working within real-world client environments. Critical skills include project research, planning, design, development, trouble-shooting and presentation.
Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Requires prerequisite course of ATLS 2000 or HUEN 2020 or ENES 2020 (all min grade C-).

ATLS 3519 (1-3) Special Topics
Analyzes special interest areas of multidisciplinary creative technology and design research and practice.
Repeatable: Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

ATLS 3523 (3) The Art and Strategy of Science Communication: Branding Climate Change
Integrating the science of climate change and science communication with the research, strategy and execution practices of strategic communication (e.g., advertising and public relations).
Equivalent - Duplicate Degree Credit Not Granted: EBIO 3523
Grading Basis: Letter Grade

ATLS 3529 (1-3) Special Topics in Critical Perspectives in Technology
Analyzes critical perspectives in creative technology and design. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.
Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.
Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C-). Restricted to Creative Technology and Design (TMEN) majors and (MTAM) minors.

ATLS 3539 (1-3) Special Topics in Creative Technology and Design
Analyzes special interest areas of multidisciplinary creative technology and design research and practice.
Repeatable: Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

ATLS 3710 (3) Material Studies and Practice
Surveys the broad array of physical materials used in design and practically applies this knowledge via hands-on projects that introduce basic tools and techniques for fabrication in the domains of woods, plastics, ceramics, concrete, fibers and metals. Practical work is complemented with inquiry into the social, aesthetic, and ecological significance of materials used in design.
Requisites: Requires prerequisite course of ATLS 1100 (minimum grade C-).

ATLS 4000 (3) Research Methods and Professional Practice
Research Methods and Professional Practice lays the foundation for students to produce culminating work in their major. In this course, students will engage in domain exploration, learn to define a research problem, utilize tools and methods for professional design research, refine presentation skills, and engage in iterative and collaborative work. This course is focused on domain research, idea validation, and prototyping in order to prepare students for a culminating semester-long Capstone project based on this research. Formerly offered as a special topics course.
Requisites: Requires prerequisite courses of ATLS 3100 and ATLS 3300 (all min grade C-). Restricted to Creative Technology and Design (TMEN) majors.

ATLS 4010 (4) Capstone Projects
Focuses on the development of an individual thesis project. Specific class sessions will feature a combination of lectures, demonstrations, guest speakers, lab sessions, and critiques. This course also entails group work, portfolio development, critical theoretical readings, and a significant written component.
Repeatable: Repeatable for up to 8.00 total credit hours.
Requisites: Requires prerequisite course of ATLS 4000 (minimum grade C-). Restricted to Creative Technology and Design (TMEN) majors only.

ATLS 4040 (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 5040
Requisites: Requires prerequisite course of ATLS 1100 (minimum grade C-).

ATLS 4112 (3) Neurohacking
Explores psychotechnologies for developing high level metacognition and individual sovereignty. We investigate the optimization of conscious human experience, mindfulness, and creativity through the lenses of neuroscience, cognitive science, evolutionary psychology, and philosophy. Students will learn to critique primary literature, experimental design, and be guided in developing a set of practices to enhance cognition and achieve various desired mental states.
Equivalent - Duplicate Degree Credit Not Granted: ATLS 5112
Requisites: Requires prereq or coreq course of ATLS 2000 or HUEN 2020 or ENES 2020 (minimum grade C-).

ATLS 4120 (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 5120
Requisites: Requires prerequisite course of ATLS 1300 or CSCI 1300 or CSCI 1320 (minimum grade C-).

ATLS 4130 (3) Experimental 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 5130
Requisites: Requires prerequisites ATLS 2200 and ATLS 2300 (all minimum grade C-). Restricted to Creative Technology and Design (TMEN) majors and (MTAM) students.

ATLS 4140 (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 5140
Requisites: Requires prerequisite ATLS 4040 (minimum grade C-).

ATLS 4141 (3) Color
Examines the generation and perception of colors in the context of physics, chemistry, biology, and psychology as a foundation for making. Explores the synthesis and applications of color dyes and pigments in art and design through lectures, readings, experiments, and projects.
Requisites: Requires prerequisite course of ATLS 2000 or HUEN 2020 or ENES 2020 (all min grade C-).

ATLS 4151 (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: ARTF 5200, MCEN 5151, MCEN 4151 and ATLS 5151
Requisites: Restricted to students with 57+ credits (juniors and above) only.
Additional Information: Arts Sci Gen Ed: Distribution-Arts Humanities

ATLS 4214 (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 5214
Requisites: Requires prerequisite course of ATLS 2270 or CSCI 2270 or CSCI 2275 (all minimum grade C-). Restricted to Creative Technology and Design (TMEN) majors or (MTAM) minors and CSEN majors and CSCI majors.

ATLS 4230 (3) Case Studies in Social Impact
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 Creative Technology Design as an emerging area of academic focus.
Equivalent - Duplicate Degree Credit Not Granted: ATLS 5230
Requisites: Restricted to Creative Technology and Design (TMEN) majors and (MTAM) minors.

ATLS 4244 (3) Empathy and Technology
Explores how the creative integration of empathy and compassion with design and technology can benefit society. Reviews foundational neuroscience and evolution of empathy. Through readings, discussion, and reflection students will develop personal practices for fostering empathy and critically investigate: empathy as a finite resource, tribalism/polarization, the weaponization of empathy, and principles for designing social systems that promote well-being. Previously offered as a special topics course.
Equivalent - Duplicate Degree Credit Not Granted: ATLS 5244
Requisites: Requires prerequisite course of ATLS 2000 or HUEN 2020 or ENES 2020 (all min grade C-).
Grading Basis: Letter Grade

ATLS 4279 (3) Aesthetics in Design
Focuses on aesthetic aspects of design via hands-on design-build experiences. Students individually create dynamic artifacts of their own choice with the assistance of teammates. Content includes major design movements since 1900, constructive critique practice, hand sketching techniques and other selected industrial design topics. Students publish their design work on an archival public blog which provides a professional portfolio element.
Equivalent - Duplicate Degree Credit Not Granted: MCEN 4279 and MCEN 5279 and ATLS 5279

ATLS 4320 (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 5320
Requisites: Requires a prerequisite course of ATLS 4120 (minimum grade C-). Restricted to College of Engineering (ENGRU) undergraduates only.

ATLS 4330 (3) Wearable Technologies
Introduces elements of embedding electronic and computational behaviors into clothing and accoutrements such as watches, handbags, and other wearable accessories. In weekly exercises students build, test, and demonstrate canonical wearable projects. Readings and video viewings survey past and current trends in wearable technologies, including materials, components, fashion and social acceptability. Participants design, develop, debug and document a wearable technology term project.
Equivalent - Duplicate Degree Credit Not Granted: ATLS 5330
Requisites: Requires prerequisite course of ATLS 3300 (minimum grade C-).

ATLS 4340 (3) Experimental Textiles
Introduces students to the design and creation of soft interactive objects using textile techniques with a focus on weaving. Specifically, students are guided through exercises intended to cultivate and embodied a sense of textile structures and the mechanical and aesthetic effects they afford. Then, students learn the state of the art of integrating electronics into these soft/deformable textiles structures. With applications from sports, medicine, fashion, architecture, and soft robotics, smart/interactive textiles require a unique set of understandings and design considerations. Students learn about textile structure development, surface design, material sourcing, and electronics integration through project-based assignments.

ATLS 4519 (1-4) Advanced Special Topics
Analyzes special interest areas of multidisciplinary creative technology and design research and practice.
Repeatable: Repeatable for up to 32.00 total credit hours. Allows multiple enrollment in term.

ATLS 4529 (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 5529
Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.
Grading Basis: Letter Grade

ATLS 4539 (1-4) Advanced Special Topics in Creative Technology and Design
Analyzes special interest areas of multidisciplinary creative technology and design research and practice.
Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

ATLS 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, INFO 4606, and ATLS 5606
Grading Basis: Letter Grade

ATLS 4616 (3) Introduction to Virtual Reality
Introduces students to the field of virtual reality (VR). Covers the historical development of virtual reality technologies and virtual reality as a research field, the mathematics of 3D coordinate systems, fundamental principles, algorithms, and design patterns in developing interactive virtual environments, the perceptual science behind mixed reality technologies, and libraries and tools for creating VR experiences.
Equivalent - Duplicate Degree Credit Not Granted: CSCI 4616
Requisites: Requires prerequisite course of ATLS 2270 or CSCI 2270 (minimum grade C-). Restricted to Creative Technology and Design (TMEN) majors and (MTAM) minors.

ATLS 4630 (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 5630
Requisites: Requires prerequisite courses of ATLS 2200 and ATLS 1300 or ATLS 3000 or CSCI 1300 or CSCI 1320 (all minimum grade C-).

ATLS 4809 (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 5809 and CSCI 4809 and CSCI 5809

ATLS 4900 (1-3) Undergraduate Independent Study
Provides opportunities for independent study at the upper-division undergraduate level. Students work on research or a creative project guided by faculty. Department consent required.
Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.
Requisites: Requires prerequisite courses of ATLS 1100 and ATLS 1300 (minimum grade C-).

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 5112 (3) Neurohacking
Explores psychotechnologies for developing high level metacognition and individual sovereignty. We investigate the optimization of conscious human experience, mindfulness, and creativity through the lenses of neuroscience, cognitive science, evolutionary psychology, and philosophy. Students will learn to critique primary literature, experimental design, and be guided in developing a set of practices to enhance cognition and achieve various desired mental states.
Equivalent - Duplicate Degree Credit Not Granted: ATLS 4112
Requisites: Restricted to Atlas (ATLS) graduate students 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) Experimental 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, ARTF 5200, ATLS 4151 and MCEN 5151

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 Atlas (ATLS) 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 Social Impact
Serves as foundation course for MS-Social Impact 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 Social Impact as an emerging area of academic focus.
Equivalent - Duplicate Degree Credit Not Granted: ATLS 4230
Requisites: Restricted to Atlas (ATLS) graduate students only.

ATLS 5240 (3) Technology for Social Impact Laboratory
Prepares students for the semester-long practicum. Students work in teams to design interventions that address unique socio-economic and environmental development issues. Teams will design a variety of interventions, including telehealth and distance education programs, communication networks, and pro-development 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 5244 (3) Empathy and Technology
Explores how the creative integration of empathy and compassion with design and technology can benefit society. Reviews foundational neuroscience and evolution of empathy. Through readings, discussion, and reflection students will develop personal practices for fostering empathy and critically investigate: empathy as a finite resource, tribalism/polarization, the weaponization of empathy, and principles for designing social systems that promote well-being. Previously offered as a special topics course.
Equivalent - Duplicate Degree Credit Not Granted: ATLS 4244
Requisites: Restricted to graduate students only.
Grading Basis: Letter Grade

ATLS 5250 (3) Fieldwork Methods
Introduces methods and models that can be employed in 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 initiatives.
Requisites: Restricted to Atlas (ATLS) graduate students only.

ATLS 5279 (3) Aesthetics in Design
Focuses on aesthetic aspects of design via hands-on design-build experiences. Students individually create dynamic artifacts of their own choice with the assistance of teammates. Content includes major design movements since 1900, constructive critique practice, hand sketching techniques and other selected industrial design topics. Students publish their design work on an archival public blog which provides a professional portfolio element.
Equivalent - Duplicate Degree Credit Not Granted: MCEN 5279 and MCEN 4279 and ATLS 4279

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 5330 (3) Wearable Technologies
Introduces elements of embedding electronic and computational behaviors into clothing and accoutrements such as watches, handbags, and other wearable accessories. In weekly exercises students build, test, and demonstrate canonical wearable projects. Readings and video viewings survey past and current trends in wearable technologies, including materials, components, fashion and social acceptability. Participants design, develop, debug and document a wearable technology term project.
Equivalent - Duplicate Degree Credit Not Granted: ATLS 4330
Requisites: Restricted to Atlas (ATLS) graduate students only.

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 5410 (3) Creative Technologies
This course gives students hands-on exposure to a wide range of technologies, including 3D printing, laser cutting, microcontrollers, sensors and programming. Through rapid prototyping and problem solving, students gain technical fluency and competence while identifying technology skills they wish to develop further.
Requisites: Restricted to Atlas (ATLS) 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.
Requisites: Restricted to Atlas (ATLS) graduate students only.
Grading Basis: Letter Grade

ATLS 5430 (3) Design Methods
In this course, students will learn to develop sense-making techniques as designers. This includes framing and structuring design research, making representations to generate insights, as well as documenting and communicating processes and outcomes. The class is structured around weekly discussions and activities anchored in real-world design challenges; and it will also offer tutorials on key design skills such as rapid prototyping and visual communication.
Requisites: Restricted to Atlas (ATLS) graduate students only.

ATLS 5440 (3) Design Studio
In this course students work with both faculty and industry expert mentors on developing a semester-long group project. In small teams, students learn to develop an interactive experience that combines project design and technical execution. The class is designed to reflect a ¿real world¿ interactive design project experience, in which students must present and deliver a large scale completed project for demonstration/exhibition at the end of the semester.
Requisites: Restricted to Atlas (ATLS) graduate students only.

ATLS 5519 (1-3) Advanced Special Topics in Creative Technology and Design
Analyzes special interest areas of multidisciplinary creative technologies and design 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) 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 INFO 4606
Requisites: Restricted to graduate students only.
Grading Basis: Letter Grade

ATLS 5610 (6) Startup Practicum
Presumes that entrepreneurism 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 5616 (3) Introduction to Virtual Reality
Introduces students to the field of virtual reality (VR). Covers the historical development of virtual reality technologies and virtual reality as a research field, the mathematics of 3D coordinate systems, fundamental principles, algorithms, and design patterns in developing interactive virtual environments, the perceptual science behind mixed reality technologies, and libraries and tools for creating VR experiences. Previously offered as a special topics course.
Equivalent - Duplicate Degree Credit Not Granted: CSCI 4616, ATLS 4616, CSCI 5616

ATLS 5620 (3) User-Experience Design 1
Through lecture, industry illustrations, and hands-on projects students will learn the end-to-end UX Design process. Through this course students will learn how to craft a professional design portfolio piece, understand contemporary UX design methodologies, and be shown how to innovate when designing at scale.
Requisites: Restricted to Atlas (ATLS) 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
Explores computation as a powerful tool for creative design and expression in a project-based studio environment. Students learn the fundamentals of creative coding, computational thinking, and object-oriented programming. Hands-on topics include generative art and design, interactivity, animation, and visualization. This class is a mix of technical instruction (both inside and outside the classroom), readings, viewings, lectures, workdays, and critiques. This is a projects-based class, but projects will vary.
Requisites: Restricted to Atlas (ATLS) 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 Atlas (ATLS) 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 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-Experience Design 2
Expands on techniques and opportunities presented in User-Experience 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.
Requisites: Requires prerequisite course of ATLS 5620 (minimum grade C).

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 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 Creative Technology and Design
Analyzes special interest areas of multidisciplinary in creative technology and design 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 6900 (1-3) Professional Internship
The objective of this course is for students to receive academic credit for internships with industry partners that have an academic component to them suitable for graduate-level work. Participation in the program will consist of an internship agreement between a student and an industry partner who will employ the student in a role that supports the academic goals of the internship. Instructor participation will include facilitation of mid-term and final assessments of student performance as well as support for any academic-related issues that may arise during the internship period.
Repeatable: Repeatable for up to 3.00 total credit hours.

ATLS 6910 (3-6) Social Impact Practicum
This practicum allows Social Impact MS students to synthesize what they have learned and test their readiness for a career in Social Impact. Practicum assignments are arranged under the supervision of the MS Program Director and involve work with a non-governmental organization, development agency or technology/policy entity. Successful completion is required for graduation from the Social Impact MS 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 6920 (3) Creative Industries Final Project
This course allows MS-CTD students to synthesize what they have learned and test their readiness for a career in the creative technologies and design field. Through this class students work with an academic and/or industry mentor to create a capstone final project emblematic of their focus during their master degree studies. Students learn to propose and scope work, adhere to budget constraints and time schedules, communicate their work, and create a final end deliverable that is presented to the larger ATLAS community. This final project is meant to serve as a culminating portfolio project that helps position students for industry after graduation. Successful completion is required for graduation from the MS-CTD Program.
Requisites: Restricted to Tech, Media and Society (ATLS) master's degree students only.

ATLS 7000 (1) ATLAS Colloquium
Each week during the fall and spring semesters, the ATLAS Colloquium features dynamic speakers from academia and industry who work in fields of interest to the creative technology and design community. Whether artists, creatives, scientists, researchers, entrepreneurs or free spirits, these speakers share their interdisciplinary experience and knowledge in an intimate, small-group setting. Topics may include programmable matters, do-it-yourself technologies, new design medium, robotic teleoperations, virtual/augmented/mixed reality, information visualization, games, design computation, creativity and cognition, personal health informatics, addictive fabrication, cyber security, ethics, education, human computer interaction and others. The ATLAS Colloquium promotes rigorous, curiosity-driven investigation in a thriving academic community that is supportive, energetic and playful.
Repeatable: Repeatable for up to 8.00 total credit hours.
Requisites: Restricted to graduate students only.

ATLS 7500 (3) ATLAS Graduate Research Methods
The objective of this course is to provide a primer for key methodological approaches used in the field. Students will investigate a broad set of techniques for conducting theoretical, design, and experimental research. They will explore how to formulate and investigate research questions using these methods. Topics covered will include basic research ethics, research project design, approaches to constructing theory, research through design techniques, and methods for experimental study.
Repeatable: Repeatable for up to 6.00 total credit hours.

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.