The graduate programs in the Department of Art + Design are designed to cultivate capacity and fluency in a range of disciplines and practices to create and deliver value and benefit for an increasingly connected and diverse world. Spanning many subjects, interests, and intentions across disparate fields and manifold practices of art, media, and design, our master’s and certificate programs will challenge and inspire you to push the boundaries of cultural production and stewardship and social and civic impact. We strive to empower you to bring your ideas to life through design conversations, media making, and artistic expression and enjoy richly rewarding careers and lives.

**Programs**

**Master of Fine Arts (MFA)**
- Experience Design (http://catalog.northeastern.edu/graduate/arts-media-design/art-design/experience-design-mfa/)
- Information Design and Data Visualization (http://catalog.northeastern.edu/graduate/arts-media-design/art-design/information-design-data-visualization-mfa/)

**Master of Science (MS)**
- Experience Design (http://catalog.northeastern.edu/graduate/arts-media-design/art-design/experience-design-ms/)
- Game Science and Design (http://catalog.northeastern.edu/graduate/arts-media-design/art-design/game-science-design-ms/)
- Information Design and Data Visualization (http://catalog.northeastern.edu/graduate/arts-media-design/art-design/information-design-data-visualization-ms/)

**Graduate Certificate**
- Experience Design (http://catalog.northeastern.edu/graduate/arts-media-design/art-design/experience-design-graduate-certificate/)
- Game Analytics (http://catalog.northeastern.edu/graduate/arts-media-design/art-design/game-analytics-certificate/)
- Information Design and Visualization (http://catalog.northeastern.edu/graduate/arts-media-design/art-design/information-design-visualization-graduate-certificate/)

**Courses**

**Art – Design Courses**

Search ARTE, ARTH, ARTG, ARTD, ARTS Courses using FocusSearch (http://catalog.northeastern.edu/class-search/?subject=ARTE%2CARTH%2CARTG%2CARTD%2CARTS)

**ARTD 5001. Art, Context, Action 1. 4 Hours.**
Offers an advanced studio-seminar to foster the creation and understanding of contemporary interdisciplinary art, emphasizing its role in reflecting and shaping its social contexts. Course activities include viewing, reading, and discussion of key projects, theories, methods, and professional practices as they have evolved over time, as well as regularly scheduled critique of the students’ ongoing bodies of work. Experiential learning opportunities allow students to interact with practitioners, curators, and institutions in the field. Offers students an opportunity to grow as practicing artists, designers, and arts professionals.

**ARTD 5002. Art, Context, Action 2. 4 Hours.**
Continues the study of interdisciplinary arts theory and practice begun in ARTD 5001.

**ARTD 5301. Independent Research Project 1. 4 Hours.**
Offers students an opportunity to independently create practiced-based design of new media performance or experiences. Expects students to independently research interactive technologies used in contemporary-based artworks. Under faculty mentorship, students independently explore methods of creative research and thematic development that result in a unique individual and/or stylistic expression in original works of art. Includes student presentations of ongoing research and works in progress to faculty for assessment.

**ARTD 5582. Collaborative Video and Community Engagement. 4 Hours.**
Offers students an opportunity to explore the process of collaborative video making with a focus on the ethics and social dynamics of civic engagement in this video production course. Expects students to participate in interactive team-based production labs that mix theoretical analysis and technical training. Examines different theories that inform conceptualizations of social justice and ethics. Explores different forms of authorship, video genres, and digital tools for collaboration ranging from crowdsourcing to remix platforms. Offers students an opportunity to produce reflection papers on the process of collaboration and engagement with diversity, as well as video art projects for organizations working on campus and in the Boston area.

**ARTD 6001. Art, Media, Participation 1. 4 Hours.**
Offers a graduate studio-seminar to foster the creation and understanding of contemporary interdisciplinary art, emphasizing how varied media strategies foster audience interaction and public engagement. Course activities include readings and discussions of key projects, theories, and professional practices as they have evolved over time, as well as scheduled critique of the students’ ongoing bodies of work. Experiential learning opportunities allow students to interact with practitioners, curators, and institutions in the field. Paves the way toward the development of a graduate thesis project and offers students an opportunity to grow as practicing artists, designers, and arts professionals.

**ARTD 6002. Art, Media, Participation 2. 4 Hours.**
Continues the study of interdisciplinary arts theory and practice begun in ARTD 6001.

**ARTE 5901. Special Topics in Art and Design Studio. 4 Hours.**
Offers an opportunity for the intensive study of specialized themes in areas of research in studio and aesthetics related to art and design. Instructor determines format and content. May be repeated up to five times.
ARTE 6210. Research Methods for the Creative Arts. 4 Hours.
Introduces major methodologies commonly used in contemporary, interdisciplinary creative practice. Emphasizes blended methods drawing on the humanities, qualitative social sciences, and design, such as the use of archival sources, visual and discursive analysis, interviews and participant observation, and human-centered and participatory design. Emphasizes questions of power and the ethical implications of creative work as framed through various theoretical lenses. Provides a venue for the design of a creative research project in support of the graduate thesis.

ARTE 6962. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ARTE 6964. Co-op Work Experience. 0 Hours.
Provides eligible students with an opportunity for work experience. May be repeated without limit.

ARTE 6976. Directed Study. 1-4 Hours.
Offers independent work under the direction of members of the department on a chosen topic. Course content depends on instructor. May be repeated up to four times.

ARTE 6984. Research. 1-4 Hours.
Offers students an opportunity to conduct research under faculty supervision. May be repeated up to four times.

ARTE 7100. Thesis Proposal. 4 Hours.
Offers candidates an opportunity to select a topic and present a proposal for a topic of study/research to a faculty committee for approval. A definition of the scope of the project, the methodologies for the research, and the assumptions being questioned or analyzed are determined. The thesis research proposal must demonstrate the student’s ability to carry out sustained and independent research to develop critical and specialist knowledge of contemporary topics in a field related to public art. Research includes aspects of scholarship in some or all of the following: theory, semiotics, ontology, phenomenology, and social or critical approaches to cultural studies.

ARTE 7990. Thesis. 4 Hours.
Offers the candidate, working with a thesis advisor, an opportunity to continue to complete the research project defined and proposed in ARTE 7100. The research is carried out in an independent manner, with periodic presentations to the thesis committee. These presentations define the benchmarks for determination of successful progress in the project. The ultimate result is an exhibition, screening, performance, or other form of public display or presentation, together with a thesis paper or written corollary.

ARTE 7996. Thesis Continuation. 0 Hours.
Offers continued work on the thesis project.

ARTG 5100. Information Design Studio 1: Principles. 4 Hours.
Explores the theories and practices of information design through studio projects. Investigates visual systems and information structures such as maps, timelines, charts, and diagrams. Emphasizes the creative process of organizing, visualizing, and communicating data by seeking to make complex information easier to understand and use. Requires graduate standing or permission of program coordinator or instructor.

ARTG 5110. Information Design History. 4 Hours.
Investigates the history of visualization practices across disciplines and in relation to technology developments. Critically examines seminal visualizations in social, cultural, and technological contexts by means of discussions and writing activities in a seminar format. Requires graduate standing or permission of program coordinator or instructor.

ARTG 5120. Research Methods for Design. 4 Hours.
Examines qualitative and quantitative research methods pertinent to design. Through discussion and writing activities, offers students an opportunity to investigate varied inquiry toward the development of researchable questions, argument formation, and assessment methodologies. Students who do not meet course restrictions may seek permission of instructor.

ARTG 5150. Information Visualization Principles and Practices. 3 Hours.
Introduces information visualization from theoretical and practical perspectives. Defines the information visualization domain and advances principles and methods for the effective visual representation of data. Contextualizes the field from a historical perspective. Presents the perceptual and cognitive tasks enabled by visualizations. Studies an extensive range of visualization models. Illustrates good and bad practices in visualization with real-world examples. Introduces concepts in computer programming in an information visualization context.

ARTG 5151. Information Design Critique Seminar. 1 Hour.
Requires students to present their work in design critique sessions to peers, faculty, and guests. Through these critiques, offers students an opportunity to improve their projects based on feedback, learn how to present their work effectively, and articulate design problems in verbal discourse. Can only be taken in conjunction with ARTG 5150.

ARTG 5310. Visual Cognition. 4 Hours.
Introduces human visual cognition as it applies to information design and visualization. Focuses on perception, attention, pattern recognition, information acquisition, memory, and creation of mental models. Explores reasoning, cognition, decision making, and problem solving in relation to visual artifacts. Students who do not meet course restrictions may seek permission of instructor or program coordinator.

ARTG 5320. Statistics Basics for Designers. 4 Hours.
Offers design students an opportunity to obtain the necessary skills to collect, summarize, analyze, and interpret data. Introduces concepts and methods in statistical reasoning and analysis. Topics include data mining, comparison, assessment, and delivery. Students who do not meet course restrictions may seek permission of instructor or program coordinator.

ARTG 5330. Visualization Technologies 1: Fundamentals. 4 Hours.
Introduces programming languages that allow computational analysis and digital delivery of dynamic information. Examines implications of environmental and personal sensor data sources, mobile collection and analysis of data, real-time networked data sets, and social use of shared data visualization tools. Students who do not meet course restrictions may seek permission of instructor or program coordinator. May be repeated once.
ARTG 5430. Visualization Technologies 2: Advanced Practices. 4 Hours.
Builds on the foundational skills acquired in ARTG 5330. Introduces students to intermediate- to advanced-level topics in web-based interactive visualization. Focuses on building greater proficiency in working with d3 and related JavaScript libraries and on acquiring knowledge of best practices and common patterns in data visualization problem solving. Through lectures, workshops, and a final project, offers students an opportunity to learn to effectively deploy their data visualization skills to explore and extract understanding from data in a critical and productive way.

ARTG 5600. Experience Design Studio 1: Principles. 4 Hours.
Offers students hands-on project development of systems, artifacts, communication, environments, or service offerings with a focus on the unique personal experience of the audience exposed to the project. Experience design is a holistic approach to design that investigates the human experience in specific situations to improve its quality, given an understanding of human goals, needs, and desires. This course provides a context for a cohesive experience through interaction, movement, and understanding, which builds on previous knowledge of audiences and applications. Presents students with design methods and processes for experience design by developing a semester-long project. Offers students an opportunity to develop competency in tools used to create the various elements that create the context for experiences in specific situations and events including interaction, artifact, and environment design. Understanding a design process and knowledge of studio critique practices is recommended.

ARTG 5610. Design Systems. 4 Hours.
Explores a systems-based perspective on our environment by addressing questions that are fundamental to design practice: What is a system, and what are the different types? How do we observe, analyze, and represent systems? What interactions can we have with systems and what are the different types of interaction? Explores structures and processes for the design of systemic relationships between people, artifacts, environments, and activities. Systems may be physical, virtual, social, or a combination. Through discussion, writing, diagramming, and project exercises, offers students an opportunity to learn principles of systems theory and explore the connection between design methods and systems thinking. Students who do not meet course restrictions may seek permission of instructor or program coordinator.

ARTG 5620. Notational Systems for Experience. 4 Hours.
Examines theoretical foundations, concepts, and methods of visual notational systems used in the effective analysis and communication of existing experiences and in the envisioning of conditions for future experiences. Notational systems are sets of graphic signs and codes that denote or prescribe specific actions, forces, operations, events, or performances that occur over time. Students engage with concepts and models through readings, discussion, case study analyses, and speculative design projects. Evaluates the role that notational systems play in documenting, analyzing, and understanding the human goals, actions, behaviors, and perceptions key to experience and assesses their value in designing for agency and new experiences. Students who do not meet course restrictions may seek permission of instructor or program coordinator.

ARTG 5640. Prototyping for Experience Design. 4 Hours.
Explores tools, technologies, and processes to create prototypes of artifacts, environments, and interactive systems for experience design projects. Offers students the opportunity to learn, use, experiment with, and test prototypes using a wide range of state-of-the-art prototyping technologies to further their understanding of multiple strategies and techniques of prototyping for experience design. Tools and techniques change over time but typically include laser cutting, 3D printing, CNC machining, electronics prototyping, augmented reality, machine tools and 2D forming, fast prototyping, and hand tools.

ARTG 6100. Information Design Studio 2: Dynamic Mapping and Models. 4 Hours.
Continues the exploration of data representations in a variety of media. Focuses on interactive and time-based techniques. Emphasizes computational methods of data collection, manipulation, and encoding. Requires graduate standing or permission of program coordinator or instructor. May be repeated once.

ARTG 6110. Information Design Theory and Critical Thinking. 4 Hours.
Examines various theoretical models of information visualization and delivery systems. Evaluates the concepts and effectiveness of the models through discussions and writing activities. Students who do not meet course prerequisites or restrictions may seek permission of program coordinator or instructor.

ARTG 6200. Information Design Studio 3: Synthesis. 4 Hours.
Continues the exploration of theories of information design and visualization through focused projects that are intended to lead to development of a thesis project. Requires graduate standing or permission of program coordinator or instructor.

ARTG 6310. Design for Behavior and Experience. 4 Hours.
Examines the potential of interfaces as mediators between information and users. Explores iterative prototyping and research methods to analyze patterns of behavior and implications of interface on effective communication. Utilizes observation, empathy, ethnography, and participatory design methods to offer students an opportunity to increase their understanding of audiences' and stakeholders' motivations and expectations. Requires graduate standing or permission of program coordinator or instructor.

ARTG 6320. Design of Information-Rich Environments. 4 Hours.
Explores methods of information organization, presentation, and navigation in physical space. Introduces concepts of wayfinding and embodiment and examines the bridging of physical and virtual spaces through the use of mobile and locative technologies. Encourages collaborative studio projects exploring interventions in public or urban environments and in exhibit-based learning environments. Undergraduate students may seek permission of instructor.

ARTG 6330. Information Design Mapping Strategies. 4 Hours.
Examines the relationships between content and context through mapping methods. Emphasizes the impact of geographic information systems, evolving technologies, community mapping tools, globalization, and delivery systems. Undergraduate students may seek permission of instructor.
ARTG 6555. Graphic Design Synthesis. 4 Hours.
This course has been designed for graduate students in the Information Design and Visualization program. It builds on skills obtained in the ARTG 5100 Information Design Studio: Principles course. The course is intended to give the students experience in the design of identity, information, and publication projects, as well as focus on cross-platform (print, digital, and three-dimensional) manifestations — all based on a single area of content. Its scope reflects the multi-faceted components that comprise real-world comprehensive design projects. Through additional research and readings, students are to perform at high level, and demonstrate how the readings of theoretical material reflect in their projects. Information and Design Visualization graduate students, or permission of the teacher.

ARTG 6600. Experience Design Studio 2: Group and Interpersonal. 4 Hours.
Offers students an opportunity to learn a human-centered design perspective and to develop experience design competency in the complex context of interpersonal and group interactions. Experience design is a holistic approach that investigates the human experience in specific situations in order to improve its quality. Students study the person-to-person aspect of human-centered design through readings and in-class activities, as well as practice applying its perspectives, models, and theories to the project process. Students are asked to participate in class discussions and create compelling experience design projects to address the needs, desires, fears, and aspirations of their audience.

ARTG 6700. Experience Design Studio 3: Synthesis. 4 Hours.
Extends the exploration of design principles and methods by starting the development of the Experience Design Master Thesis. Examines how to develop effective design interventions capable of enriching human experience in specific situations, sites, and in the context of comprehensive activities. Emphasizes a systems perspective in both research and design development—the relationships between diverse participant groups and communities as well as the complex implications and interrelations of interventions at multiple scales and dimensions.

ARTG 6900. Special Topics in Design. 4 Hours.
Explores focused research topics relevant to the graduate program curriculum. Undergraduate students may seek permission of program coordinator or instructor. May be repeated up to five times.

ARTG 7100. Thesis Seminar for Design. 4 Hours.
Examines emerging research and critical practices in design. Offers students an opportunity to develop the visual and verbal expression of the thesis through writing, discussion, presentation, and critique.

ARTG 7910. Design Project and Exhibition. 4 Hours.
Offers students an opportunity to focus on the design of pieces, artifacts, and experiences for the thesis exhibition. Includes planning and design of the exhibit. Situates the thesis contributions to design as project-based discipline. Discusses and reflects on the design process at the crossroads of methodological, systematic iteration, and creative exploration.

ARTG 7990. Thesis. 4,8 Hours.
Offers students support in developing and producing the written component of a design thesis that integrates and applies their accumulated knowledge. Encourages student participation within a practice and research community consisting of classmates, advisor(s), and external professionals. Restricted to students in experience design and Information design and visualization.

ARTG 7996. Thesis Continuation. 0 Hours.
Offers students continuing thesis supervision by members of the department.

ARTH 5100. Contemporary Art Theory and Criticism. 4 Hours.
Introduces the major critical and philosophical approaches that have transformed the reception, interpretation, and production of contemporary art since the 1960s. Examines a range of key interpretive methodologies—including modernism, postmodernism, psychoanalysis, feminism, Marxism, poststructuralism and deconstruction, critical race theory, visual studies, and globalization—designed to provide practitioners with the means to critically frame their own art making within contemporary debates about the meaning and social functions of art.

ARTH 5200. Issues in Contemporary Art. 4 Hours.
Introduces the major artists, movements, and issues that have redefined contemporary art since the late twentieth century. Examines, both critically and historiographically, topics such as conceptualism, earth art, appropriation, installation, street art, identity politics, activist art, performance, globalization, relational art, and new media. Offers an overview aimed at helping students negotiate the relationship between their own artistic practice and global art worlds.

ARTH 5400. Contemporary Visual Culture. 4 Hours.
Explores the implications of the erosion of the traditional boundary between fine art and mass culture for artistic theory and practice as well as art’s place in an increasingly globalized world. Situates contemporary artistic practice within the broader context of visual culture—including film, television, advertising, architecture, and the Internet.

ARTH 5902. Special Topics in Art and Design History. 4 Hours.
Offers an opportunity for the intensive study of specialized themes in areas of research in art history, aesthetics, or critical studies. Format and content are determined by the instructor in this elective in Art + Design history. May be repeated up to five times.

ARTH 6962. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ARTH 6976. Directed Study. 1-4 Hours.
Offers directed study of a specific topic not normally contained in the regular course offerings but within the area of competence of a faculty member. May be repeated without limit.

ARTS 5100. Visual Ideation. 4 Hours.
Explores drawing in a variety of media that communicate critical and analytical thinking about arts in the public sphere. Offers students an opportunity to learn how to use drawing and visualization to communicate effectively in a variety of media, either on paper or in digital media. Students can use collage, photo, digital media, and freehand drawing to express ideas for larger environmental and public projects. (Drawing is the way that artists such as Christo propose large-scale projects and is a viable way to secure acceptance of an idea.)

ARTS 6000. Studio. 4 Hours.
Offers students an opportunity to be mentored by a faculty member while completing the studio art portion of the master’s degree. May be repeated up to four times.

Game Science and Design
Search GSND Courses using FocusSearch (http://catalog.northeastern.edu/class-search/?subject=GSND)
GSND 5110. Game Design and Analysis. 4 Hours.
Provides theoretical background and foundation for analyzing and designing games. Examines fundamental domains that are necessary to understand what games are and how they affect players, including but not limited to interface design, level design, narrative, learning, and culture. Presents relevant concepts and frameworks from a wide variety of disciplines—psychology, phenomenology, sociology, anthropology, media studies, affect theories, learning theories, and theories of motivation—for each domain. Explains the core elements of game design, introduces students to formal abstract design tools, explores several models of design process and iteration, and offers students an opportunity to practice game design in groups.

GSND 5111. Seminar for GSND 5110. 1 Hour.
Offers students an opportunity to discuss and analyze selected games, applying concepts from GSND 5110. Exposes students to a varied mix of AAA and indie titles and demonstrates how to analyze and appreciate them. Open to seniors; restricted to students in selected colleges.

GSND 5112. Recitation for GSND 5110. 0 Hours.
Requires students to familiarize themselves with industry-standard game development tools and to demonstrate their familiarity by developing a simple game. Participation in the recitation is integral to success in GSND 5110.

GSND 5122. Business Models in the Game Industry. 1 Hour.
Examines the underlying business structure of the interactive digital entertainment industry and the characteristics of the various participants, notably developers and publishers. Seeks to deliver insight into key business models within the game industry and how the economic challenges interact. Explores the game business landscape across the industry spectrum, ranging from AAA, mobile, casual to indie development. Examines market strategies currently in practice and how they are linked with game analytics. Topics range from retail vs. online, free-to-play modes vs. pay-to-play, as well as basic monetization and distribution channels. Designed to serve as an overview of the various stakeholders in the industry and how they interact.

GSND 5130. Mixed Research Methods for Games. 4 Hours.
Focuses on methods and methodologies from human-computer interaction (HCI) and their use in different applications, including apps, web applications, games, and virtual worlds. Covers the basics of user-oriented evaluation, associated topics, and usability methods. Introduces the design process, usability heuristics, HCI paradigms, task models, and cognitive models. Examines quantitative and qualitative analysis of data. Offers students an opportunity to delve into experimental design, institutional review board approvals, ethics, research subject recruitment, and experiment implementations. Applies concepts through concrete projects, case examples, and exercises. expects students to be running assignments continually and trying out different evaluation methods and methodologies.

GSND 5131. Recitation for GSND 5130. 0 Hours.
Requires students to familiarize themselves with statistical analysis software and to demonstrate their ability to use the software and statistics by analyzing an existing data set retrieved from a game study. Participation in the recitation is integral to success in GSND 5130.

GSND 6240. Exploratory Concept Design. 4 Hours.
Explores the process of designing new modalities of interaction utilizing novel uses of established technology, e.g., pervasive and affective technologies. Focuses on philosophy and practice of creating and evaluating experimental interactions. Recontextualizes gameplay concepts through permutations of basic elements such as controls, platforms, cameras, interfaces, etc. Leverages constraints as vehicles to push the boundaries of accepted design. Explores four key approaches to experimental interaction through course projects and assignments: discovering, examining, and exploring potential new technologies and interaction principles; rapidly designing and prototyping experimental interactions; pitching, justifying, and explaining designs and prototypes to others; and addressing new technologies and forms of interaction from a research perspective, focusing on their larger implications and potential impact on play.

GSND 6250. Spatial and Temporal Design. 4 Hours.
Explores the development and understanding of spaces used by people in 3D and 2D virtual environments. Uses an iterative process of making, criticizing, experiencing, and analyzing spatial form; compositional ideas for form making; and critical thinking. Offers students an opportunity to develop the arbitrary, yet necessary, mind-set needed to make assumptions about aesthetic spatial values and expected player behaviors. Analyzes the connection between spatial-aesthetic elements and their effects on players’ psyches. Experiments with how spaces, textures, shapes, and colors can support different synchronous moods. Explores how to shape spaces that fit the rational, emotional, and behavioral profile of different types of players. Applies concepts learned from architecture and game-level design to extend students’ creative and critical abilities.

GSND 6320. Psychology of Play. 4 Hours.
Explores theories of perception, motivation, needs, learning, goals, and belief systems as they pertain to games and play. Examines psychological principles, including visual and audio perception, emotions, behavior, personality, and the more recent scientific discoveries around psychological models explaining play behavior or motivation theories behind play. Introduces how players learn in and from games based on the relationship of play to learning theories. Forms a solid theoretical basis for a new segmentation tool—psychographics. Explores visual and cultural archetypes, digging into comics, movie sets, and cartoons to distillate what makes people tick in certain ways relating to universal theories of perception and gestalt theories. Applies the theories through critical analysis of play behavior and games.

GSND 6330. Player Experience. 4 Hours.
Focuses on topics of player psychology—cognition; memory; emotions; attention; and game-focused theories such as engagement, fun, user experience, player-need-satisfaction model, and flow. The development cycle of any game relies on the understanding of the players, the target market of the game product. Covers game usability engineering and game-specific evaluation methods, such as play testing, rapid iterative testing and evaluation (RITE), play-heuristic evaluation, and retrospective play reviews. Offers students an opportunity to learn how to analyze qualitative and quantitative data and to apply parametric and nonparametric statistical evaluation methods, qualitative data coding and analysis, and descriptive statistics. Requires students to apply visualization techniques of data and reporting.

GSND 6331. Recitation for GSND 6330. 0 Hours.
Requires students to familiarize themselves with survey instruments and data visualization techniques. Participation in the recitation is integral to success in GSND 6330.
GSND 6340. Biometrics for Design. 4 Hours.
Covers the domain of psychophysiological testing. Introduces theory and research in major areas of human psychology, including cognition, emotions, and attention. Studies the principles, theory, and applications of psychophysiological assessment inside and outside interactive digital entertainment. Offers students an opportunity to understand the basics of eye tracking—eye movements, fixations, saccades. Applies methods of data collection, cleaning, and analysis for both physiological and eye-tracking data. Covers all issues of using such measurements, including validity of conclusions and confounding variables. Covers the process of triangulation and repotting in-depth along the entire process of the game production life cycle.

GSND 6350. Data-Driven Player Modeling. 4 Hours.
Introduces the topic of game analytics, defined as the process of discovering and communicating patterns in data with a goal of solving problems and developing predictions in user behavior supporting decision management, driving action, and/or improving game products. Covers the fundamental tools, methods, and principles of game analytics, including the knowledge-discovery process, data collection, feature extraction and selection, pattern recognition to aid in prediction and churn analysis, visualization, and reporting. Covers analytics across game forms, notably online games and delivery platforms. Presents analytical tools recommended during development and tools designed for ongoing maintenance of games.

GSND 6984. Research. 1-4 Hours.
Offers students an opportunity to conduct research under faculty supervision. May be repeated up to four times.

GSND 7976. Directed Study. 1-4 Hours.
Offers independent work under the direction of members of the department on chosen topics. May be repeated without limit.

GSND 7990. Thesis. 4 Hours.
Focuses on preparing a master's thesis under faculty supervision.

GSND 7996. Thesis Continuation. 0 Hours.
Offers continued work on the thesis project.