**INST - INFORMATION STUDIES**

**INST401 Design and Human Disability and Aging (3 Credits)**
Focuses on the design of consumer products and information systems to enable their use by persons with a wider range of physical, sensory, and cognitive abilities. Overviews aging and major types of impairment as they relate to resulting problems using consumer products and information systems. Focuses on principles of design of mass market products.

**Restriction:** Permission of instructor.

**Credit Only Granted for:** INST408B or INST401.

Formerly: INST408B.

**INST402 Designing Patient-Centered Technologies (3 Credits)**
Companies have created a vast array of apps and other technologies for understanding managing personal health and wellness, but many of them have been created with little understanding of audience needs or potential ethical issues. Course introduces students to the unique challenges of studying people’s health and wellness needs as well as designing and evaluating technologies to meet those needs.

**Prerequisite:** A minimum of a C- in INST201, MATH115, PSYC100, INST126, and STAT100.

**Restriction:** Must be in the Information Science program.

**INST408 Special Topics in Information Science (3 Credits)**
Selected topics in information science.

**Prerequisite:** 1 course with a minimum grade of C- from (INST201, INST301); and minimum grade of C- in INST126, STAT100, PSYC100, and MATH115.

**Restriction:** Must be in Information Science program.

**Repeatable to:** 9 credits if content differs.

**INST414 Data Science Techniques (3 Credits)**
An exploration of how to extract insights from large-scale datasets. The course will cover the complete analytical funnel from data extraction and cleaning to data analysis and insights interpretation and visualization. The data analysis component will focus on techniques in both supervised and unsupervised learning to extract information from datasets. Topics will include clustering, classification, and regression techniques. Through homework assignments, a project, exams and in-class activities, students will practice working with these techniques and tools to extract relevant information from structured and unstructured data.

**Prerequisite:** 1 course with a minimum grade of C- from (INST201, INST301); and minimum grade of C- in INST126, INST314, STAT100, MATH115, and PSYC100.

**Restriction:** Must be in Information Science program.

**INST441 Information Ethics and Policy (3 Credits)**
Explores via case studies the legal, ethical, and technological challenges in developing and implementing policies for managing digital assets and information. Emphasizes access questions pertinent to managing sensitive information and the roles and responsibilities of information professionals.

**Prerequisite:** INST341; or permission of instructor.

**INST442 Digital Curation Across Disciplines (3 Credits)**
Examines how to apply digital curation principles, tools, and strategies in managing diverse data collections and digital information in different disciplinary settings. Explores differences among data curation principles and practices across diverse settings, ranging from scientific organizations (such as business and academic research laboratories and computational science settings), to humanities-based institutions (such as cultural heritage organizations) to social science-based institutions (such as data-intensive professional environments).

**INST443 Tools and Methods for Digital Curation (3 Credits)**
Introduces students to the application of digital tools and methods in a variety of organizational settings, academic disciplines, and economic sectors. Hands-on experience with digital curation tools is an integral part of the course, and will be provided in the Digital Curation Innovation Center (DCIC).

**Prerequisite:** Must have completed or be concurrently enrolled in INST341.

**INST447 Data Sources and Manipulation (3 Credits)**
Examines approaches to locating, acquiring, manipulating, and disseminating data. Imperfection, biases, and other problems in data are examined, and methods for identifying and correcting such problems are introduced. The course covers other topics such as automated collection of large data sets, and extracting, transforming, and reformatting a variety of data and file types.

**Prerequisite:** 1 course with a minimum grade of C- from (INST201, INST301); and minimum grade of C- in INST126, INST327, STAT100, MATH115, and PSYC100; and 1 course with a minimum grade of C- from (INST326, CMSC131).

**Restriction:** Must be in Information Science program.

**INST448 Digital Curation Research in Cultural Big Data Collections (3 Credits)**
Students will learn the principles, methods, and technologies involved in the digital curation of large cultural data collections. Students will learn these concepts in class lectures, discussions, and participating on project teams in the Digital Curation Innovation Center (DCIC).

**Prerequisite:** INST311.

**Restriction:** Must be in Information Science program.

**Repeatable to:** 6 credits if content differs.

**INST452 Health Data Analytics (3 Credits)**
Health data analytics involves the extrapolation of actionable insights from patient data, using data sources such as electronic health records (EHRs), claims data, surveillance data, and surveys. Health data is complex, often unstructured and incomplete, and is organized for clinical care rather than to meet analytic needs. This course will involve the use of various analytical methods in order to translate large and complex data, whether structured or unstructured, into insights that improve decision-making from both the patient and provider perspectives.

Healthcare data are rich and hold so much potential, but a challenge is presented to patients, providers, and even government agencies when it comes to figuring out how to leverage these data. Students in this course will learn foundational topics in data analytics focused on health data and will apply this knowledge to real health datasets through hands-on labs integrated into the lectures.

**Prerequisite:** Minimum of a C- in INST201, MATH115, PSYC100, INST126, and STAT100.

**Restriction:** Must be in the Information Science program.

**INST462 Introduction to Data Visualization (3 Credits)**
Exploration of the theories, methods, and techniques of visualization of information, including the effects of human perception, the aesthetics of information design, the mechanics of visual display, and the semiotics of iconography.

**Prerequisite:** 1 course with a minimum grade of C- from (INST201, INST301); and minimum grade of C- in INST126, INST314, MATH115, PSYC100, and STAT100.

**Restriction:** Must be in Information Science program.
INST464 Decision Making for Cybersecurity (3 Credits)  
Discusses human and organizational decision making from a variety of perspectives. Applies different risk assessment and decision making frameworks that are relevant to personal and organization cybersecurity, with a focus on the quantitative Factor Analysis of Information Risk (FAIR) model. Considers monetary, social and societal costs of cybersecurity decisions. Considers a range of questions relating to cybersecurity, from whether to install a game on a smartphone to how to allocate scarce information security resources in an organization.  
Prerequisite: Must have earned a minimum grade of C- in INST201, INST126, MATH115, PSYC100, and INST364.  
Restriction: Must be in Information Science program.  
Credit Only Granted for: INST408W or INST464.  
Formerly: INST408W.  

INST465 Design and Human Disability and Aging (3 Credits)  
Design of special and mainstream products and systems to include use by people facing barriers to use due to disability and aging. Includes introduction to people with disabilities and the tools they use and strategies for cross-disability inclusive design of special and mainstream technology. The class will then be divided into interdisciplinary design teams. These teams will be given a special or mass market product for which they are to develop a design which is more accessible, yet remains mass producible and marketable. Emphasis will be on practical mass-market design and the realities and constraints of design for commercial production and/or public systems.  
Credit Only Granted for: INST408B or INST465.  
Formerly: INST408B.  

INST466 Technology, Culture, and Society (3 Credits)  
Individual, cultural, and societal outcomes associated with development of information & communication technologies (ICTs), including profound and anti-social factors. Unpacking how gender, race, ethnicity, sexual orientation, disabilities, and political affiliations affect consumption and production of online experiences. Unpacking how structures of dominance, power and privilege manifest at individual, institutional and cultural levels.  
Prerequisite: 1 course with a minimum grade of C- from (INST201, INST301).  
Restriction: Must be in the Information Science program.  

INST467 Practical Hacking for Policy Makers (3 Credits)  
Explores the key issues facing policy makers attempting to manage the problem of cybersecurity from its technical foundations to the domestic and international policy considerations surrounding governance, response, critical infrastructure risk management, and privacy. Designed for students with little to no background in information technology, and will provide the principles to understand the current debates shaping a rapidly evolving security landscape.  
Prerequisite: Minimum grade of C- in INST126, INST201, INST364, MATH115, STAT100, and PSYC100.  
Restriction: Must be in Information Science program.  
Credit Only Granted for: INST408V, PLCY388C, or INST467.  
Formerly: INST408V.  

INST490 Integrated Capstone for Information Science (3 Credits)  
The capstone provides a platform for Information Science students where they can apply a subset of the concepts, methods, and tools they learn as part of the Information Science program to addressing an information problem or fulfilling an information need.  
Prerequisite: 1 course with a minimum grade of C- from (INST201, INST301); and minimum grade of C- in INST126, INST311, INST314, INST326, INST327, INST335, INST346, INST352, INST362, PSYC100, STAT100, and MATH115.  
Restriction: Must be in Information Science program; and permission of INFO-College of Information Studies.  

INST603 Systems Analysis and Design (3 Credits)  
Formal process for planning and designing an information technology system, including identifying users and other stakeholders, analyzing work processes, preparing system specifications, conducting feasibility and usability studies, and preparing for implementation. Approaches to analyzing system components and functions. Measurement and evaluation of system performance.  
Restriction: Permission of INFO-College of Information Studies.  
Credit Only Granted for: INST603, LBSC603, or INFM613.  
Formerly: INFM613  

INST604 Introduction to Archives and Digital Curation (3 Credits)  
Overview of the principles, practices, and applications in the archival and digital curation fields.  
Restriction: Permission of INFO-College of Information Studies.  
Credit Only Granted for: LBSC604 or LBSC605.  

INST607 Government Information (3 Credits)  
An introduction to the nature and scope of government information. Tracing the ongoing efforts of government agencies to offer information, services, and resources online, this course examines the nature, current impacts, and future impacts of E-government. More specifically, the course explores information and communication technologies designed to make government more open and transparent; the design, implementation, and evaluation of efficient, effective, and new government and governance mechanisms; the role of information institutions in supporting E-government; and the development and implementation of selected public facing E-government tools (e.g., portals, visualizations).  
Restriction: Permission of INFO-College of Information Studies.  
Credit Only Granted for: INFM718E, INST607, or LBSC708E.  
Formerly: INFM718E and LBSC708E.  

INST608 Special Topics in Information Studies (1-3 Credits)  
Covers special topics in information studies.  
Repeatable to: 6 credits if content differs.  

INST610 Information Ethics (3 Credits)  
Investigation of the diverse range of ethical challenges facing society in the information age. Ethical theories, including non-Western and feminist theories. Application of theories to information ethics issues.  
Restriction: Permission of INFO-College of Information Studies.  
Credit Only Granted for: INFM718Q, INST610, or LBSC708I.  
Formerly: INFM718Q and LBSC708I.  

INST611 Privacy and Security in a Networked World (3 Credits)  
Evolving conceptualization of privacy and security issues in light of technological developments in the 21st century. Analysis of legal, ethical, design, and socially constructed challenges that organizations and individuals face when developing privacy and security solutions.  
Restriction: Permission of INFO-College of Information Studies.
INST612 Information Policy (3 Credits)
Nature, structure, development and application of information policy. Interactions of social objectives, stakeholders, technology and other forces that shape policy decisions.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INST612 or LBSC625.
Formerly: LBSC625.

INST613 Information and Human Rights (3 Credits)
An examination of information as a human right, including topics: social, cultural, economic, legal, and political forces shaping information rights; the impact of information rights on information professions, standards, and cultural institutions; and information rights and disadvantaged populations.
Restriction: Permission of INFO-College of Information Studies.

INST614 Literacy and Inclusion (3 Credits)
The educational and psychological dimensions of helping and supporting new users to become information literate and experienced users to remain engaged.
Restriction: Permission of INFO-College of Information Studies.

INST615 Information Professionals and the Law (3 Credits)
An exploration of the interrelated issues of the provision of and information literacy about legal information by information organizations and the impacts of legal issues, such as privacy and filtering, on the practice of information organizations that serve the public.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC735 OR INST615.
Formerly: LBSC735.

INST616 Open Source Intelligence (3 Credits)
An introduction to Open Source Intelligence (OSINT) for Information Professionals. For the purposes of this course, OSINT will be defined as the use of free, publicly available online sources that can be used to gather information that may be later used to conduct analysis or reach conclusions. Students will learn basic and advanced techniques for using search engines, people directories, social media networks, location-based services, images and videos, public records, and other sources. The course will also offer students more technical aspects of open-source information, including domains, IP addresses, and the deep web. Throughout the modules, data quality and validation procedures will be key topics.
Restriction: Permission of INFO-College of Information Studies.

INST617 Computational Journalism (3 Credits)
Designed to teach the application of computational methods in journalism and reporting. The methods include natural language processing, visualization, and web data mining. The course will also cover the necessity and impact of journalistic ethics in designing computation solutions.
Prerequisite: Permission of the Philip Merrill College of Journalism. Cross-listed with: JOUR773. Jointly offered with: JOUR473.
Credit Only Granted for: JOUR779V, JOUR773, JOUR473, JOUR479V, INST617, INST408I, or INST403.
Formerly: JOUR779V.

INST620 Diverse Populations, Inclusion, and Information (3 Credits)
Importance of equality of information access. Social, political, and technological barriers to information. Information needs of diverse and underrepresented populations. Principles of inclusive information services.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC620 OR INST620.
Formerly: LBSC620.

INST621 Managing Digital Innovations in Organizations (3 Credits)
Students will learn the main theoretical perspectives on managing digital innovations, become familiar with current best practices of innovating with IT, and develop innovation skills in various organizational settings such as project teams, functional departments, organizations, communities, and society at large.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INFM718Z or INST621.
Formerly: INFM 718Z.

INST622 Information and Universal Usability (3 Credits)
Information services and technologies to provide equal experiences and outcomes to all users. Laws, standards, approaches, component concepts, access needs, and technologies in relation to physical and online information environments.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC622 OR INST622.
Formerly: LBSC622.

INST627 Data Analytics for Information Professionals (3 Credits)
Skills and knowledge needed to craft datasets, perform quantitative and qualitative analyses, and develop information resources that bridge the gap between raw data and decision makers’ needs.
Restriction: Permission of INFO-College of Information Studies.

INST630 Introduction to Programming for the Information Professional (3 Credits)
An introduction to computer programming intended for students with no previous programming experience. Topics include fundamentals of programming and current trends in user interface implementation that are relevant to information professionals.
Restriction: Permission of INFO-College of Information Studies.

INST631 Human-Computer Interaction Design Methods (3 Credits)
Methods of user-centered design, including task analysis, low-tech prototyping, user interviews, usability testing, participatory design, and focus groups.
Prerequisite: LBSC671, INFM603, or INST631; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.

INST633 Analyzing Social Networks and Social Media (3 Credits)
Introduces students to the science and social science of network analysis. Through real world examples, including analysis of their own social networks, students will develop skills for describing and understanding the patterns and usage of services like Facebook, Twitter, YouTube, and others. Students will read classic and cutting edge articles and books about these topics and discuss their applicability to this new social media. The class will culminate with a capstone project in which students will apply the analysis methods they have learned to understanding a particular question about social networks and social media.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC708L or INST633.
Formerly: LBSC708L.

INST638 HCI Professional Preparation Seminar (1 Credit)
The human-computer interaction area is huge and diverse, yet all HCI professionals will face a common set of challenges upon embarking into their future careers, including job hunting, interviewing, joining a team, managing group dynamics, and staying abreast of current technology. Students will learn how to tackle these challenges from a series of speakers familiar with current industry practice.
Repeatable to: 3 credits if content differs.
INST639 Practical Skills in HCI (1 Credit)
Current industry practice in the HCI and UX field involves being familiar with many practical skills and specialized software. In this repeatable course, HCIM students will be able to acquire some of these vital practical skills in order to be better prepared for joining industry upon graduation. Furthermore, this will also be an opportunity for students to develop their portfolio for future job hunts. Offered in both Fall and Spring semesters, the intention is for these "practical skills" to be taught by professional instructors with expert knowledge. The content of the course will vary from semester to semester, but here is a sample of topics: Graphic and visual design and communication; UX design and research in games; Voice and gestures; UX mockups and wireframing tools; Practical web design and technologies; UX project management software.
Repeatable to: 3 credits if content differs.

INST640 Principles of Digital Curation (3 Credits)
Principles for the design and implementation of long-term curation of digital data and information assets, including born-digital and digitized assets. Frameworks for analysis of technical, practical, economic, legal, social and political factors affecting digital curation decisions. Case studies of specific digital curation scenarios.
Restriction: Permission of INFO-College of Information Studies.

INST641 Policy and Ethics in Digital Curation (3 Credits)
Discussion of strategies to address intellectual property, privacy, security and other policy and ethics concerns raised by the curation of digital records and data.
Prerequisite: INST604; or INST640; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.

INST643 Curation in Cultural Institutions (3 Credits)
An overview of the principles, practices, and current debates in the management, care and representation of digital artifacts in libraries, archives, and museums.
Restriction: Permission of INFO-College of Information Studies.

INST644 Introduction to Digital Humanities (3 Credits)
A survey of the history, methods, and principal topics of the Digital Humanities, examined from theoretical and applied perspectives.
Restriction: Permission of INFO-College of Information Studies.

INST645 Personal Digital Curation (3 Credits)
Discussion and workshop in selecting and preserving digital personal data and records.
Restriction: Permission of INFO-College of Information Studies.

INST646 Principles of Records and Information Management (3 Credits)
Principles and practices of managing records in the context of information management programs in government, corporate and other institutional settings. Includes access; legal requirements; digital technologies; and creation, administration, appraisal, and retention and disposition of records.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC680 OR INST646.
Formerly: LBSC680.

INST647 Management of Electronic Records & Information (3 Credits)
Focuses on the life cycle of records and the impact of technology programs for managing electronic records. Explores the roles of records managers in the management of electronic records.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC682 OR INST647.
Formerly: LBSC682.

INST650 Facilitating Youth Learning in Formal and Informal Environments (3 Credits)
The historical, organizational, and contemporary contexts of formal and informal learning spaces; the principles of teaching, learning, and information literacy that underlie the formal and informal learning spaces; and the leadership role that information professionals can play within their schools, libraries and communities.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INST650 or LBSC640.
Formerly: LBSC640.

INST651 Promoting Rich Learning with Technology (3 Credits)
Exploration of how technology can be used to promote rich learning experiences, with a particular focus on youth populations. Assessment of the how, when, and why of infusing technology into the teaching and learning process.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INST651 or LBSC642.
Formerly: LBSC642.

INST652 Design Thinking and Youth (3 Credits)
Methods of design thinking specifically within and for youth contexts, including user-centered design, understanding user needs, ideation, contextual design, participatory design, iterative prototyping, and visual design. These topics will specifically be studied in the context of designing with and for youth.
Restriction: Permission of INFO-College of Information Studies.

INST660 Strategic Leadership (3 Credits)
Students will use research and best practices to act and think like a leader, increase your self-awareness, and learn how to unlock potential in others. From the stories of great leaders and everyday people, you will learn and practice empowerment, accountability, courage, creativity, and humility, which are the key leadership skills. In addition, this course will teach you how to create new opportunities and lasting impact to drive growth and value creation in your organization.
Prerequisite: INFM612; or LBSC631; or LBSC635; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INST660, LBSC708F or INFM718F.
Formerly: LBSC708F, INFM718F.

INST661 Introduction to Game, Entertainment, and Media Analytics (3 Credits)
With the continuing global growth in the Game, Entertainment, and virtual/augmented reality and immersive experiences industries, entertainment providers increasingly depend on data analytics to maintain a competitive edge while continuing to improve the customer experience. This course provides an overview of the Game, Entertainment, and Media (GEM) industries, discuss the relationships between the entertainment providers and the entertainment consumers, and explore the analytical techniques used to maximize the overall value to both the providers and consumers. The course will focus on the uses of analytics methods such as personalization, recommendation, clustering and segmentation, behavioral analytics, etc., will discuss core data management and data architecture concerns, and examine how big data infrastructure can support scalability as data volumes grow and as streaming speeds accelerate. In addition we review socio-technical aspects of entertainment, especially in the areas of cyberpsychology, social networks, and information policy concerns such as privacy protection, fraud, equity, and national security concerns.
Prerequisite: Permission of the instructor.
INST670 Introduction to Javascript Programming (1 Credit)
Introduction to the fundamentals of Javascript programming. Basic components of all programming languages, including variables, types, data structures, and control flow, with a focus on leveraging Javascript libraries for more advanced functionality. No prior experience needed.
Credit Only Granted for: INST728N and INST670.
Formerly: INST728N.

INST671 Introduction to Web Programming (1 Credit)
Introduction to the fundamentals of designing and programming web sites. HTML programming extended by work with Cascading Style Sheets. Programming skills are complemented with fundamentals of design and usability. No prior programming experience needed.
Credit Only Granted for: INST728W or INST671.
Formerly: INST728W.

INST673 Hands On Machine Learning with Weka (1 Credit)
Students will receive hands on experience with the open-source machine learning tool Weka. Topics covered will be classification, regression, basic algorithm types, how to get data into a format Weka can process, how to interpret results, and basic document classification. The class will meet online.
Recommended: It is recommended that students have some familiarity with programming prior to taking this course.
Restriction: Permission of INFO-College of Information Studies.

INST680 Health Informatics (3 Credits)
An introduction to the ways in which medical data, information, and knowledge are created, stored and used. Students will gain an understanding of the current trends in the delivery of medical care and the ways in which these trends influence health information resources and systems.
Prerequisite: Must have completed or be concurrently enrolled in INFM600 or LBSC602; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INST680 or INST728F.
Formerly: INST728F.

INST681 Health Information Behavior (3 Credits)
Exploration of information needs of healthcare professionals and the general public, as well as how they seek information to fulfill these information needs, impacts and outcomes of health-related information-seeking by multiple populations. Examination of models and theories and empirical studies of patient and healthcare professional information behavior.
Prerequisite: INFM600; or LBSC602; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.

INST682 Personal Health Informatics & Visualization (3 Credits)
Personal Health Informatics cover a broad concept that encompasses an array of approaches to collect, store, share, analyze, and reflect on personal health data. Not only health care providers are relying on Health Technologies to improve patient care, people are increasingly using health devices and apps in their everyday life. Individuals have started using new technologies to collect data, increase awareness, and reflect on and change their behaviors. They also use various tools for curiosity and fun. This course will provide an overview of this exciting field and examine how social and behavioral theories can be applied to create effective health applications. It is difficult to create health technologies that can successfully be integrated into people’s daily life due to many obstacles in individuals’ data collection, integration, self-reflection, and sharing practices. Understanding these challenges is an important part of designing Health Technologies. Therefore, this course will cover HCI and design thinking methods that you can leverage in understanding the adoption of Health Technologies. Moreover, visualizations facilitate people to gain insights from their data, so we will cover common visualization approaches used in the personal data contexts.

INST701 Introduction to Research Methods (3 Credits)
Techniques and strategies of research as applied to the definition, investigation, and evaluation of information problems. Qualitative, quantitative, and mixed methods of research design methods are considered from the aspects of implementation, analysis, and interpretation.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC701, INFM718M or INST701.
Formerly: LBSC701, INFM718M.

INST702 Advanced Usability Testing (3 Credits)
Usability testing methods – how to design and implement them both for desktop and mobile sites. Students will learn the complex process of facilitating usability testing and how to synthesize test data into a report.
Prerequisite: Permission of instructor; or (INFM605 or INST631).
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INFM702 or INST702.
Formerly: INFM702.

INST704 Inclusive Design in HCI (3 Credits)
An introduction to inclusive technology design, that is, the design and evaluation of user interfaces for diverse users and use contexts. Building on basic concepts in human-computer interaction, students will learn about design exclusion and barriers to use, and methods by which these can be overcome. Assistive input and output technologies will also be covered. Populations include older adults, users with visual, cognitive or motor impairments, users who are deaf or hard of hearing, children, users in low resource contexts, and users in mobile contexts. Research trends and practical design considerations (e.g., web accessibility requirements) will be covered. Students will interact with the material through readings, discussion, and individual and group assignments.
Prerequisite: INST631; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INST728Z OR INST704.
Formerly: INST728Z.
**INST706 Project Management (3 Credits)**
Comprehensive overview of project management, focusing on the needs of information resource (IR) projects. Concepts and techniques for planning and execution of projects including developing work breakdown structure, estimating costs, managing risks, scheduling, staff and resource allocation, team building, communication, monitoring, control, and other aspects of successful project completion.
**Prerequisite:** INFM603 and INFM612; or (LBSC631 and LBSC671); or (LBSC635 and LBSC670); or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INST706 or INFM706.
Formerly: INFM706.

**INST709 Independent Study (1-3 Credits)**
Intensive individual study, reading, or research in an area of specialized interest under faculty supervision. Registration limited to the advanced student with the approval of the advisor and of the faculty member involved.
**Prerequisite:** Completion of all core courses.
**Restriction:** Permission of INFO-College of Information Studies; and permission of instructor.
**Repeatable to:** 9 credits.

**Additional Information:** A student may complete no more than 9 credits registered under 709 or a total of 12 credits registered under 708 and 709.

**INST710 User Experience Research Methods (3 Credits)**
Students will learn to conduct user research in industry and to provide foundational knowledge needed for academic research. It examines the theoretical and epistemological differences between research paradigms and provides an overview of qualitative, quantitative and mixed-method approaches. It overviews user-centered design (UCD) methods, and uses Contextual Inquiry/Contextual Design as the backbone for a research project, incorporating related formative UCD methods and techniques. It is a project-based course, where students conduct a semester-long project to prepare them for the HCIM Capstone as well as other types of formative user research.

**INST711 Interaction Design Studio (3 Credits)**
Covers basic interaction design principles and design process from a studio-based design perspective. Focuses on how to design for interactions that will resonate with your audiences: how the features and functions of a project get translated into something people find usable, useful, and desirable. Explores the role of interaction designers. Students design and prototype interactive products, systems, and services.
**Prerequisite:** Must have completed or be concurrently enrolled in INST631 and INST710.

**INST714 Information for Decision-Making (3 Credits)**
The use of information in organizational and individual decision-making. An examination of managers’ behavior in using information; differences between the private and public sectors; and the roles of information professionals and information systems in decision-making.
**Prerequisite:** LBSC631 or INFM612; or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INFM718A, INST714 or LBSC705.
Formerly: INFM718A and LBSC705.

**INST715 Knowledge Management (3 Credits)**
**Prerequisite:** INFM600 or LBSC671; or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INST715 or LBSC715.
Formerly: LBSC715.

**INST716 Information, Technology, and Society (3 Credits)**
An exploration of the mutually constitutive relationship between information technology (IT) and society, including how IT transforms society and how society transforms IT.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INST716, LBSC708T, or INFM718T.
Formerly: LBSC708T and INFM718T.

**INST725 Legal Research for Information Professionals (3 Credits)**
An in-depth exploration of the methods, resources, and context of conducting advanced legal research. After offering an overview of various types of legal materials, the course will focus on finding and analyzing legal materials through various primary sources, databases, secondary sources, and public records for government and corporate settings. The course will also discuss practical issues of conducting legal research, such as data management and budgeting.
**Prerequisite:** INST615.
**Restriction:** Permission of INFO-College of Information Studies; and must be in Human-Computer Interaction (Master’s) program.

**INST727 Internship Practicum in Human-Computer Interactions (3 Credits)**
Required, supervised experience working in an industry, government, non-profit organization or an educational institution to address a problem in Human-Computer Interaction. Students will spend a minimum of 120 hours working in the agency during the internship.
**Prerequisite:** INST631 and INST632.
**Recommended:** INST701.
**Restriction:** Permission of INFO-College of Information Studies; and must be in Human-Computer Interaction (Master’s) program.

**INST733 Database Design (3 Credits)**
**Prerequisite:** LBSC690, LBSC671, or INFM603; or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INST733 or LBSC793.
Formerly: LBSC793.
**INST734 Information Retrieval Systems** (3 Credits)
Principles of organizing and providing access to information using automated information storage and retrieval systems. Retrieval systems models, index language selection, data structure, user interfaces, and evaluation for text and multimedia applications.
**Prerequisite:** LBSC671 or INFM603; or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INFM603, INFM741, LBSC671, or LBSC796.
**Formerly:** LBSC796.

**INST735 Computational Linguistics I** (3 Credits)
Fundamental methods in natural language processing. Topics include: finite-state methods, context-free and extended context-free models of syntax; parsing and semantics interpretation; n-gram and Hidden Markov models, part-of-speech tagging; natural language applications such as machine translation, automatic summarization, and question answering.
**Prerequisite:** CMSC421 or CMSC422; or students who have taken courses with comparable content may contact the department; or permission of instructor. Cross-listed with: CMSC723, LING723.
**Credit Only Granted for:** CMSC723, LING723, or INST735.
**Additional Information:** CMSC students may only receive PhD Comp. credit for CMSC723 or CMSC823, not both.

**INST736 Computational Linguistics II** (3 Credits)
Natural language processing with a focus on corpus-based statistical techniques. Topics include: stochastic language modeling, smoothing, noisy channel models, probabilistic grammars and parsing; lexical acquisition, similarity-based methods, word sense disambiguation, statistical methods in NLP applications; system evaluation.
**Prerequisite:** LING723, CMSC723, or INST735; or permission of instructor. Cross-listed with CMSC773, LING773.
**Credit Only Granted for:** CMSC773, LING773, or INST736.
**Additional Information:** CMSC students may only receive PhD Comp. credit for CMSC723 or CMSC823, not both.

**INST737 Introduction to Data Science** (3 Credits)
An exploration of some of the best and most general approaches to get the most information out of data through clustering, classification, and regression techniques.
**Prerequisite:** INST627; and (LBSC690, LBSC671, or INFM603). Or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.

**INST741 Social Computing Technologies and Applications** (3 Credits)
Tools and techniques for developing and configuring social computing applications. Theories and paradigms for social computing. Strengths and limitations of different application styles and types. Evolution of applications as responses to social computing challenges. Information and organizational systems co-development.
**Prerequisite:** INFM603 and INFM605; or (LBSC602 and LBSC671); or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INFM741 or INST741.
**Formerly:** INFM741.

**INST742 Implementing Digital Curation** (3 Credits)
**Prerequisite:** INST604; or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.

**INST744 Solving Problems in Digital Curation - Capstone Course** (3 Credits)
Project-based course that applies digital curation principles and techniques first-hand in an institutional program setting. The focus is on a well-defined project that constitutes a learning experience and also permits the student to contribute to the ongoing work of the host institution. The project must address one or more aspects of digital curation: design and implementation for long-term digital curation of a discrete collection; application of technologies and standards for digitization, description, and preservation of digital assets; or implementation of strategies to provide access to a digital collection.
**Restriction:** Must be enrolled in the Curation and Management of Digital Assets (CMDA) Certificate.

**INST745 Introduction to Digital Arts Curation** (3 Credits)
Representation and curation of art artifacts through digital media, with a focus on how to collect and manage born-digital artifacts, digitized artifacts, and their related data and metadata.
**Prerequisite:** INST604; or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.

**INST746 Digitization of Legacy Holdings** (3 Credits)
Through hands on exercises and real-world projects, students will learn how to incorporate digitization of analog holdings into an existing archival program and how to link records of different formats and from different collections together.
**Prerequisite:** INST604.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INST728B or INST746.
**Formerly:** INST728B.

**INST747 Research in Advanced Digital Curation** (3 Credits)
Students will build their ability to understand the complexity of research strategies and apply tools involved in the management and use of digital information in the Age of Big Data. The class will contain class lectures, class discussions, assigned readings, and extensive hands-on experience with student experience in digital curation projects. The research projects are focused around six major themes that will engage students in multiple arenas of research in Big Data. These are: community displacement, refugee narratives, movement of people, citizen internment, racial zoning, and cyberinfrastructure for digital curation. Project participants will have the opportunity to work with external stakeholders.
**Prerequisite:** INST604; or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INST728L or INST747.
**Formerly:** INST728L.

**INST750 Advanced Data Science** (3 Credits)
Application of data science techniques to unstructured, real-world datasets including social media and geo-referenced sources. Techniques and approaches to extract information relevant for experts and non-experts in areas that include smart cities, public health, and disaster management.
**Prerequisite:** INFM603 and INST737; or permission of instructor.
**Restriction:** Permission of INFO-College of Information Studies.
**Credit Only Granted for:** INFM750 OR INST750.
**Formerly:** INFM750.
INST751 IoT and Streaming Data Analytics (3 Credits)
An increasing number of sensors, actuators, Internet-connect instruments and apparatuses, smart devices, and systems are generating and broadcasting a wide variety of continuous data streams. Machine-generated structured data sources are joined by a myriad of unstructured data streams from social media, weather, and news sources, among others. Integrated into networks, these continuously-streaming devices (collectively referred to as the Internet of Things, or IoT) provide a fertile array of data sources that can be ingested and analyzed to inform and automate decision processes for numerous purposes including operational intelligence, process monitoring, optimization, risk management, personalization, and prediction in real time. This course looks at architectures and operational modes for streaming data sources and examine methods for descriptive analytics, creation of predictive models, and integrated deployment of these models via centralized and edge computing resources. We will discuss a variety of uses cases for streaming data analytics and how they are applied in different industries including public utilities, smart cities, manufacturing, telecommunications, and healthcare.
Prerequisite: INFM603, INST733, or other programming and database courses, or Permission of the instructor.

INST752 Location Intelligence (3 Credits)
Provides a comprehensive overview of the principles of geographic information systems and location analytics for a variety of business scenarios. Explores the processes for integrating location information, maps, and demographic information with business information and implementing analytical applications. Reviews business contexts such as government and citizen analysis, zoning and planning, retail site selection, supply chain management and logistics, field service planning and tracking, real estate, insurance, public safety, municipal maintenance, and others. Provides hands-on opportunities to apply location intelligence methods.
Prerequisite: INFM600, INFM603, INST630, and INST733; or permission of INFO-College of Information Studies.

INST753 Information Governance and Data Quality (3 Credits)
Surveys the methods and practices for understanding the relationship between organizational performance objectives and their effective oversight, use, and management of information. Examines methods for instituting information governance, data governance, and data quality in the context of information policies for assessing information risk, observing data policies, and enforcing accountability for protection of sensitive information. Explores models of data ownership and accountability, roles and responsibilities for data governance and data stewardship, and processes for soliciting and documenting information and data requirements. Covers techniques for data quality assessment, specification of data quality rules, and applications for validating compliance with data quality expectations, monitoring levels of data quality, and notifications and dashboards for monitoring data compliance.
Prerequisite: INFM600, INFM603, and INST733; or permission of INFO-College of Information Studies.

INST754 Data Integration and Preparation for Analytics (3 Credits)
Provides a comprehensive overview of the end-to-end processes for acquiring, ingesting, managing, cleansing, transforming and integrating data sources for the purposes of reporting and analytics. Concepts include data acquisition, data streaming, data staging, standardization, data quality, concept and metadata harmonization, transformation, and data modeling. Students will learn how ingested data sets can be transformed, integrated, and prepared for analytical use.
Prerequisite: INFM600, INFM603, INST630, and INST733; or permission of INFO-College of Information Studies.

INST755 eGovernment for Smart Cities (3 Credits)
Federal, state, and local government entities are increasingly communicating, interacting, and providing services digitally in an online and networked environment. Concurrently, urban planners and administrators seek to leverage the potential of rapidly evolving technologies to transform service provisioning for the efficient management of assets and resources, with the goal of creating sustainable, livable, innovative, and economically vibrant cities and communities. This course will examine the intersection of these two developments and provide a framework for understanding the technical, policy, and information management issues that are emerging.

INST756 Information Risk Management (3 Credits)
Looks at information system threats, vulnerabilities, risk assessment and management. Explores how regulations scope and define what is considered to be protected information. Considers how data assets are assessed and classified in terms of their levels of sensitivity. Discusses specifying data protection policies and the techniques for enforcing compliance with those policies.
Prerequisite: INFM600; or permission of INFO-College of Information Studies.

INST760 Data Visualization (3 Credits)
Introduction to the science and technology of data visualization—the graphical representation of data to aid understanding—and includes both theoretical foundations as well as practical applications of integrated visualization techniques on real-world problems. Application of these techniques to state-of-the-art problem domains within research, society, and industry.
Prerequisite: INST630; or INFM603; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INST760 or INST728V.
Formerly: INST728V.

INST762 Visual Analytics (3 Credits)
Visual analytics is the use of interactive visual interfaces to facilitate analytical reasoning. In essence, visual analytics is based on the—not uncontroversial—idea that humans and computers working alone are insufficient for the data challenges of today and tomorrow, and that effective synthesis of both humans and computational algorithms are needed to create human-in-the-loop systems. Thus, visual analytics bridges human-centered disciplines such as visualization and human-computer interaction with computation-centered disciplines such as machine learning, probabilistic methods, and knowledge discovery. The course contents will include both theoretical foundations of this interdisciplinary science as well as practical applications of integrated visual analysis techniques on real-world problems.
Prerequisite: INFM603 or INST630; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: INST728Q OR INST762.
Formerly: INST728Q.
INST765 Programming on the Web (3 Credits)
Non-programmers will learn basic programming and how to develop familiarity with web formatting and programming paradigms, including XML, REST, APIs, and authentication schemes. The class begins with an introduction to basic programming and students build on those skills by programming applications that use web-based data and services.
Prerequisite: INFM603, LBSC690, LBSC671, or INST733; or permission of instructor.
Credit Only Granted for: INFM743 or INST765.
Formerly: INFM743.

INST767 Big Data Infrastructure (3 Credits)
Principles and techniques of data science and business intelligence. Technologies and architectures for large-scale data warehousing and scale-out data analytics platforms. Supervised and unsupervised data mining.
Prerequisite: INST737; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.

INST770 Information and Preparedness, Response and Recovery in Japan (3 Credits)
Education abroad program in Japan. Examines how individuals and groups respond to disaster through informal and formal practices of community resilience and recovery. Focuses on Japanese uses of information for these purposes, including storytelling, game-based learning, social media, archives, and memorials. Examines Japanese principles of community and kizuna ("connectedness"). Includes 2 weeks of pre-departure online course in the US, 1 week of study and travel in Japan over spring break, and 2 weeks of post-return online coursework in the US.
Credit Only Granted for: INST370 or INST770.

INST771 Foundations of Cybersecurity (3 Credits)
Explores the foundational concepts of cybersecurity including the Threat Landscape, the evolution and structures of the global telecommunications network, key communication protocols and foundations of networks, the history, culture and emergence of the hacking process, and the core motivations and tactics of threat actors.

INST772 Policy and Practice of Ethical Hacking (3 Credits)
Provides students with an understanding of the ethical frameworks and technical approach in the conduct of penetration testing and ethical hacking. Students will work with real systems in real environments and will leverage real vulnerability analysis and exploitation tools in a live environment. Upon completion, students will understand the overall concepts guiding penetration testing from a practical, hands-on vantage point.
Prerequisite: Must have completed or be concurrently enrolled in INST771.

INST773 Cyber Intelligence Fundamentals (3 Credits)
Provides students with an understanding of how to identify, track, and report on malicious activity. Students will learn to identify and work with malware and network data and pair it with a broader set of threat intelligence information to draw conclusions based on the totality of open source information and network intelligence. Students will gain a in depth understanding of the principles of cyber threat intelligence and techniques applied in the cyber threat industry. Students will engage in in-depth discussion and practice in evaluating and interpreting indicators of compromise, command and control, and artifacts left by malicious actors.
Prerequisite: INST771.

INST775 HCIM CAPSTONE PREP (3 Credits)
Students will define a project, which requires a high level of background research, rigor in execution and evaluation, and documentation. Capstone projects may follow the design, prototyping and evaluation process from end-to-end or may focus on a subset of elements in that process, such as formative study and design.
Prerequisite: INST631, INST632, and INST717; and must have completed Research Methods; and permission of INFO-College of Information Studies. Or permission of instructor.
Restriction: Must be taken in the fall semester of the year in which the student plans to graduate; and permission of INFO-College of Information Studies.

INST776 HCIM CAPSTONE PROJECT (3 Credits)
The opportunity to apply the skills learned through coursework in a semester-long project applied to a real-world problem. Capstone projects may follow the design, prototyping and evaluation process from end-to-end or may focus on a subset of elements in that process, such as formative study and design.
Prerequisite: INST775; or permission of instructor.
Restriction: Must be taken in the semester immediately following completion of INST775 HCIM Capstone Prep; and permission of INFO-College of Information Studies.

INST779 Readings Seminar (1 Credit)
Readings in emerging topics. Through readings and discussion the class will critically assess future directions and highlight intersection points with other disciplines (e.g., medicine) and sub-disciplines of information studies and computer science (e.g., information retrieval, computer vision, machine learning). One or more themes will be covered over the semester (e.g., inclusive design, health informatics, environmental sustainability, social networking) and will be chosen based on instructor and student interest.
Restriction: Permission of INFO-College of Information Studies.
Repeatable to: 3 credits if content differs.
Credit Only Granted for: INST779, INST728J.
Formerly: INST728J.

INST782 Arrangement, Description, and Access for Archives (3 Credits)
Introduction to the key concepts and practices involved with arrangement and description of archives, and the techniques appropriate to enable users to access archival information in traditional and nontraditional archival contexts.
Prerequisite: INST604; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC684, LBSC781, LBSC782, or INST782.
Formerly: LBSC684, LBSC781, and LBSC782.

INST784 Digital Preservation (3 Credits)
Issues and practices regarding digitization of analog materials and preservation of digital materials, both digitized and born digital.
Prerequisite: INST604; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC784 or INST784.
Formerly: LBSC784.

INST785 Documentation, Collection, and Appraisal of Records (3 Credits)
Development of documentation strategies and plans; collecting policies to guide programs in acquiring records; theories and techniques for appraising records to identify those with continuing value.
Prerequisite: INST604; or permission of instructor.
Restriction: Permission of INFO-College of Information Studies.
Credit Only Granted for: LBSC785 OR INST785.
Formerly: LBSC785.
INST794 Capstone in Youth Experience (3 Credits)
Through a supervised project, to synthesize design thinking, participatory
design, connected learning, and learning theory/frameworks students
will produce a technology-infused program for and with youth. Students
will develop and carry out a project with a community partner through
their library system. The project must incorporate technology and design
thinking, and must be based on one or more learning theory/frameworks.
Through the course, students will learn many practical skills related to
planning and implementation of a technology-infused programming
at or through their library, including marketing, fundraising, budgeting,
legal issues, logistical issues, developing and sustaining community
partnerships, developing engaging experiences for youth, and creating
and analyzing learning assessments.
Prerequisite: INST650, INST651, and INST652; or permission of
instructor.
Restriction: Permission of INFO-College of Information Studies; and must
be part of Youth Experience (YX) certificate program.

INST799 Master's Thesis Research (1-6 Credits)
Repeatable to: 99 credits.

INST800 The Engaged Intellectual: An Introduction to Research and
Academic Work (3 Credits)
An introduction to the academic life with a particular focus on what it
means to undertake research, teaching, and service.
Restriction: Permission of INFO-College of Information Studies; and
restricted to students in Ph.D. in Information Studies (INFS) program.

INST808 Seminar in Research Methods and Data Analysis (3 Credits)
Topics and issues in information studies research. Design and conduct of
research project.
Restriction: Permission of INFO-College of Information Studies. And must
be in Information Studies (Doctoral) program; or permission of instructor.
Repeatable to: 9 credits if content differs.
Credit Only Granted for: INST808, LBSC802, or INST802.
Formerly: LBSC802, INST802.

INST809 Individualized Teaching Experience (3-5 Credits)
Introduction to the techniques and challenges associated with design,
delivery, and evaluation of courses offered at the University level. The
doctoral student will work one-on-one with a faculty member in the
development and co-teaching of a graduate level course.
Prerequisite: Must have completed 18 credit hours of doctoral course
work.
Restriction: Permission of INFO-College of Information Studies; and
permission of instructor.
Repeatable to: 6 credits.
Credit Only Granted for: INST809, LBSC774, INST728G.
Formerly: INST728G.

INST810 Individual Research Experience (1-3 Credits)
Pre-candidacy individual research experience directed by a faculty
member.
Repeatable to: 3 credits.

INST818 Individual Research Experience (1-3 Credits)
Pre-candidacy individual research experience directed by a faculty
member.
Repeatable to: 3 credits.

INST878 Special Topics in Information Studies (3 Credits)
Seminar topics offered as faculty and student interests warrant. Topic
varies.
Restriction: Permission of INFO-College of Information Studies. And must
be in Information Studies (Doctoral) program; or permission of instructor.
Repeatable to: 9 credits if content differs.
Credit Only Granted for: INST878 or LBSC878.
Formerly: LBSC878.

INST888 Doctoral Seminar (3 Credits)
Advanced seminar on selected topics in information studies.
Restriction: Must be in Information Studies (Doctoral) program; and
permission of INFO-College of Information Studies.
Repeatable to: 6 credits if content differs.
Credit Only Granted for: INST888 or LBSC888.
Formerly: LBSC888.

INST98 Pre-Candidacy Research (1-8 Credits)

INST999 Doctoral Dissertation Research (1-8 Credits)