

# DIGITAL SCIENCES (DSCI)

## DSCI 10010 SOCIETY, CULTURE AND THE DIGITAL SCIENCES 3 Credit Hours

A survey course intended to give a broad understanding of society, culture and the digital sciences. Students understand not only the impact of digital sciences on culture and society, but also the impact of culture and society on the development and adoption of digital sciences. Topics include relationship and identify formation and maintenance, the relationship between digital science and race, gender, culture and globalization.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

## DSCI 10310 MY STORY ON THE WEB 3 Credit Hours

A first course in understanding the web's impact on our private and public lives. Introductory course that enables students to establish a web presence and persona by the end of the semester. Through the storytelling initiative and creating these sites, students investigate web site design, storytelling, multimedia, intellectual property, ethical considerations and social media.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

## DSCI 10410 INFORMATION ETHICS AND SOCIAL RESPONSIBILITY 3 Credit Hours

Investigates ethical and social responsibility issues related to information technology including the application of ethical theories to information technology; potential tensions between ethical and legal norms as well as those between competing ethical values; professional codes of ethics; access and control of intellectual property; issues of privacy including those raised by the US Patriot Act; network security and user protections (e.g. viruses, protecting minors, cyberbullying); and the digital divide, outsourcing and green computing.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

## DSCI 13210 DESIGN PROCESSES AND PRINCIPLES 3 Credit Hours

Introduction to the discipline of design, including general design models and procedures, rational and creative models of design, and design as problem solving. Specific design contexts are introduced including information design, graphics and visual design, architectural design and educational design.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

## DSCI 15310 COMPUTATIONAL THINKING AND PROGRAMMING 3 Credit Hours

Introductory, broad, and hands-on coverage of basic aspects of computational thinking with emphasis on problem solving using the Python programming language.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

## DSCI 19995 SPECIAL TOPICS IN DIGITAL SCIENCES 1-4 Credit Hours

(Repeatable for credit) Analysis of significant and current issues in digital sciences not covered in regular courses. Offered when opportunities and resources permit; the topic is announced when the course is scheduled.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 1-4 lecture

**Grade Mode:** Standard Letter

## DSCI 23410 COGNITION IN TECHNOLOGY 3 Credit Hours

Introduction to the basics in human cognition as they affect technology and as technology affects human cognition. Addresses designing technologies to fit and enhance cognition, augmenting cognition with technology, and cognitive tools, as well as the impact of technology on various cognitive processes.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

## DSCI 26010 TELECOMMUNICATION INFRASTRUCTURE 3 Credit Hours

Provides an overview of communications infrastructure for public switched telephone networks, wireless networks, and local area networks. Other topics covered include network routing, LAN concepts and technologies, VoIP, and PBX.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

## DSCI 29995 SPECIAL TOPICS IN DIGITAL SCIENCES 1-4 Credit Hours

(Repeatable for credit) Analysis of significant and current issues in digital sciences not covered in regular courses. Offered when opportunities and resources permit; the topic is announced when the course is scheduled.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 1-4 lecture

**Grade Mode:** Standard Letter

## DSCI 31010 ENTERPRISE ARCHITECTURE 3 Credit Hours

Enterprise architecture facilitates the alignment of IT and IS investment decisions with business goals. Enterprise architecture is increasingly used in the industry as a result of the continued emergence of new technologies and ongoing pressures to reengineer business processes to achieve improved efficiency and greater customer focus. Enterprise architecture identifies the main components of an organization and the ways in which these components work together. The components include performance and strategy, people, business capabilities, applications, technology, knowledge and information, as well as financial and other resources.

**Prerequisite:** Sophomore standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 33310 HUMAN-COMPUTER INTERACTION 3 Credit Hours**

A survey course intended to provide a broad foundation of HCI principles, concepts, and techniques relevant to multiple digital science concentrations. Focuses on understanding HCI through fundamental design concepts and applying these to a range of interface design problems. Covers the spectrum of a user-centered design process (research, sketching, prototyping, evaluation, etc). Balances a broad conceptual understanding of HCI with detailed interface design issues.

**Prerequisite:** Sophomore standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 34410 DIGITAL INFORMATION MANAGEMENT AND PROCESSING 3 Credit Hours**

Introduces students to the discipline of information management and processing methods and tools that are available to support effective management of information within organizations. Aims to provide a pragmatic foundation of principles, practices and technologies that can be applied within commercial and government organizations to help improve information management.

**Prerequisite:** Sophomore standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 39995 SPECIAL TOPICS IN DIGITAL SCIENCES 1-4 Credit Hours**

(Repeatable for credit) Analysis of significant and current issues in digital sciences not covered in regular courses. Offered when opportunities and resources permit; the topic is announced when the course is scheduled.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 1-4 lecture

**Grade Mode:** Standard Letter

**DSCI 40910 CAPSTONE IN DIGITAL SCIENCES (ELR) 3 Credit Hours**

Provides an integrative experience, bringing together components of the required coursework in the major. Students work in project teams with students from upper-division project courses in programs affiliated with the School of Digital Sciences.

**Prerequisite:** DSCI 41510 and TECH 46411; and MIS 44043 or CS 33007; and Senior standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**Attributes:** Experiential Learning Requirement

**DSCI 41510 PROJECT MANAGEMENT AND TEAM DYNAMICS (WIC) 3 Credit Hours**

Introduces students to the basic elements of project management as it relates to software development and the corporate environment. Although not formally endorsed by The Project Management Institute, the course aligns with the project management lifecycle approach endorsed in The Project Management Book of Knowledge.

**Prerequisite:** DSCI 15310 or CS 13001 or CS 13012 or MIS 24065; and Junior standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**Attributes:** Writing Intensive Course

**DSCI 41610 DIGITAL SYSTEMS SECURITY 3 Credit Hours**

Provides students with an understanding of the techniques, approaches, strategies, and computer security tactics that are used to ensure computer-related assets are protected from potential cyber compromise and are integrated with the business function. This course does not focus on the technical aspects of security (e.g., details of the operating system, data structures, or networks) but instead focuses more on computer security in a business context.

**Prerequisite:** DSCI 15310 or CS 13001 or CS 13012 or MIS 24065; and Junior standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 49910 EMERGING TECHNOLOGIES IN DIGITAL SCIENCES 1-3 Credit Hours**

(Cross-listed with DSCI 59910) Explores new and emerging technologies in the digital sciences, examining each technology from multiple viewpoints representative of the interdisciplinary nature of the digital sciences.

**Prerequisite:** Junior standing.

**Schedule Type:** Lecture

**Contact Hours:** 1-3 lecture

**Grade Mode:** Standard Letter

**DSCI 49992 INTERNSHIP IN DIGITAL SCIENCES (ELR) 1-6 Credit Hours**

(Repeatable for a maximum of 6 credit hours) A credit-bearing work experience with educational outcomes, utilizing and enhancing a student's academic learning in practical occupational situations. The student is expected to complete pre-determined assignments, which may include a weekly journal, final paper, or experience report.

**Prerequisite:** Junior standing and special approval.

**Schedule Type:** Practicum or Internship

**Contact Hours:** 3-18 other

**Grade Mode:** Standard Letter

**Attributes:** Experiential Learning Requirement

**DSCI 49995 SPECIAL TOPICS IN DIGITAL SCIENCES 1-4 Credit Hours**

(Repeatable for credit) Analysis of significant and current issues in digital sciences not covered in regular courses. Offered when opportunities and resources permit; the topic is announced when the course is scheduled.

**Prerequisite:** None.

**Schedule Type:** Lecture

**Contact Hours:** 1-4 lecture

**Grade Mode:** Standard Letter

**DSCI 49996 INDIVIDUAL INVESTIGATION IN DIGITAL SCIENCES 1-3 Credit Hours**

(Repeatable for a maximum of 6 credit hours) Independent study carried out by a student under the supervision of a faculty member. Subject content, objectives, assignments and evaluation methods may vary.

**Prerequisite:** Junior standing and special approval.

**Schedule Type:** Individual Investigation

**Contact Hours:** 1-3 other

**Grade Mode:** Standard Letter-IP

**DSCI 51510 PROJECT MANAGEMENT AND TEAM DYNAMICS 3 Credit Hours**

This course introduces students to the basic elements of project management as it relates to software development and the corporate environment. Although not formally endorsed by The Project Management Institute ([www.PMI.org](http://www.PMI.org)), the course will align with the project management lifecycle approach endorsed in The Project Management Book of Knowledge.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 51610 DIGITAL SYSTEMS SECURITY 3 Credit Hours**

Provides students with an advanced understanding of the techniques, approaches, strategies, and computer security tactics that are used to ensure computer-related assets are protected from potential cyber compromise and are integrated with the business function. This course does not focus on the technical aspects of security (e.g., details of the operating system, data structures, or networks) but instead focuses more on computer security in a business context.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 59910 EMERGING TECHNOLOGIES IN DIGITAL SCIENCES 1-3 Credit Hours**

(Cross-listed with DSCI 49910) Explores new and emerging technologies in the digital sciences, examining each technology from multiple viewpoints representative of the interdisciplinary nature of the digital sciences.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 1-3 lecture

**Grade Mode:** Standard Letter

**DSCI 59995 SPECIAL TOPICS IN DIGITAL SCIENCES 1-4 Credit Hours**

(Repeatable for credit) Analysis of significant and current issues in digital sciences not covered in regular courses. Offered when opportunities and resources permit; the topic is announced when the course is scheduled.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 1-4 lecture

**Grade Mode:** Standard Letter

**DSCI 60998 CAPSTONE PROJECT IN DIGITAL SCIENCES 3 Credit Hours**

Provides an integrative experience, bringing together components of the required coursework in the major and concentration. Students perform individual work on a project, research paper, or practicum under the supervision of faculty from programs affiliated with the School of Digital Sciences. Students must be in their final semester in the Master of Digital Sciences program to enroll in this course.

**Prerequisite:** Minimum GPA of 3.00; Graduate standing and special approval by Digital Sciences Graduate Coordinator.

**Schedule Type:** Master's Project

**Contact Hours:** 3 other

**Grade Mode:** Standard Letter

**DSCI 61010 ENTERPRISE ARCHITECTURE 3 Credit Hours**

Explores the alignment of IT and IS investment decisions with business goals. Enterprise architecture is increasingly used in industry as a result of the continued emergence of new technologies and ongoing pressures to reengineer business processes to achieve improved efficiency and greater customer focus. Enterprise architecture identifies the main components of an organization and the ways in which these components work together. The components include performance and strategy, people, business capabilities, applications, technology, knowledge and information, as well as financial and other resources.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 61310 ENTERPRISE ARCHITECTURE: ENTERPRISE ARCHITECTURE CENTER OF EXCELLENCE METHODOLOGY 2 Credit Hours**

Provides an introduction to the Enterprise Architecture Center of Excellence (EACOE) methodology for enterprise architecture and practical experience using that methodology. Students learn to model a business' current or desired future state using architectural models of goals, processes, materials, roles, locations and events. Implementation models are then developed to show relationships between architectural models, and the models are analyzed to identify move-ahead initiatives that include projects, gaps, overlaps and opportunities. These initiatives are prioritized to move the business to a desired future state. At the conclusion of the course, students have the option of submitting their course enterprise architecture artifacts to EACOE for certification. Pre/

**Prerequisite:** Graduate standing.

**Corequisite:** DSCI 61010.

**Schedule Type:** Lecture

**Contact Hours:** 2 lecture

**Grade Mode:** Standard Letter

**DSCI 61510 PROJECT MANAGEMENT LEADERSHIP 3 Credit Hours**

This course introduces advanced project management and project management leadership as it relates to software development and the corporate environment. The course focuses on the project management principles of effective planning, communication and motivation throughout the project lifecycle, and one key project management deliverable such as the project management plan. Although not formally endorsed by The Project Management Institute ([www.PMI.org](http://www.PMI.org)), the course will align with the project management lifecycle approach endorsed in The Project Management Book of Knowledge.

**Prerequisite:** DSCI 41510 or DSCI 51510 and Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 62010 BUSINESS ARCHITECTURE 3 Credit Hours**

Exploration of the concept of business architecture as the critical component of enterprise architecture. Students learn how to develop an enterprise business architecture, to apply business architecture principles, methods and artifacts to support business IT alignment and to support change management needed to implement roadmaps and initiatives based on the business architecture. Students learn how different enterprise architecture frameworks approach the business layer.

**Prerequisite:** DSCI 61010 and Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 62210 WEB DEVELOPMENT IN DIGITAL SCIENCES 3 Credit Hours**

Beginning with basic coverage of HTML, CSS, PHP, this course continues to explore those topics along with MySQL, jQuery, JavaScript and others. The course will also explore other topics relevant to web development in digital sciences, including security principles, hierarchy and visual design, responsive design, accessibility issues, interaction design, social media, and legal issues.

**Prerequisite:** CS 61002 or CS 61003 or TECH 56330; and Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 64010 DATA ARCHITECTURE 3 Credit Hours**

Exploration of data modeling at the conceptual and logical level of abstraction within the context of enterprise architecture. Students learn to identify business needs in terms of data to gain a holistic view of organizational data. Students use Master Data Management (MDM) and approaches to define various data sources.

**Prerequisite:** DSCI 61010 Enterprise Architecture and Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 64210 DATA SCIENCE 3 Credit Hours**

Overview of the concept of data mining, machine learning, big data, and data analytics, including the business challenges of working with data to solve real-world business problems. Students become familiar with the Cross Industry Standard Process for Data Mining (CRISP-DM). Fundamental concepts include Business Problem Understanding, Data Understanding, Data Preparation, Modeling, Evaluation, and Deployment. Data analytics in industry verticals are discussed, including science, intelligence and law enforcement, health, retail and financial services.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 65010 APPLICATION AND TECHNOLOGY ARCHITECTURE 3 Credit Hours**

Introduction to the concept of application and technology architectures in the context of enterprise architecture. Students learn how to define application and technology architecture principles and standards to support business performance, and to evaluate existing architectures in relation to performance goals. Students learn to work with application and technology artifacts and matrices, prepare a technology dictionary and develop an application architecture blueprint.

**Prerequisite:** DSCI 61010 and Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 3 lecture

**Grade Mode:** Standard Letter

**DSCI 69199 THESIS I 2-6 Credit Hours**

(Repeatable for a maximum of 6 credits hours) Thesis students must register for a total of 6 hours and may take 2 to 6 hours per semester distributed over several semesters if desired.

**Prerequisite:** Graduate standing and special approval by the Digital Sciences Graduate Coordinator.

**Schedule Type:** Masters Thesis

**Contact Hours:** 2-6 other

**Grade Mode:** Satisfactory/Unsatisfactory-IP

**DSCI 69299 THESIS II 2 Credit Hours**

(Repeatable for credit) Thesis students must continue registration each semester until all degree requirements are met.

**Prerequisite:** DSCI 69199 and graduate standing.

**Schedule Type:** Masters Thesis

**Contact Hours:** 2 other

**Grade Mode:** Satisfactory/Unsatisfactory-IP

**DSCI 69992 INTERNSHIP IN DIGITAL SCIENCES 1-3 Credit Hours**

(Repeatable for a maximum of 6 credit hours) Work experience with educational outcomes, utilizing and enhancing students' academic learning in practical occupational situations. Students are expected to complete pre-determined assignments, which may include a weekly journal, final paper or experience report.

**Prerequisite:** Graduate standing and special approval.

**Schedule Type:** Practicum or Internship

**Contact Hours:** 3-9 other

**Grade Mode:** Standard Letter

**DSCI 69995 SPECIAL TOPICS IN DIGITAL SCIENCES 1-4 Credit Hours**

(Repeatable for credit) Analysis of significant and current issues in digital sciences not covered in regular courses. Offered when opportunities and resources permit; the topic is announced when the course is scheduled.

**Prerequisite:** Graduate standing.

**Schedule Type:** Lecture

**Contact Hours:** 1-4 lecture

**Grade Mode:** Standard Letter

**DSCI 69996 INDIVIDUAL INVESTIGATION IN DIGITAL SCIENCES 1-3 Credit Hours**

(Repeatable for credit) Independent study carried out by a student under the supervision of a faculty member. Subject content, objectives, assignments, and evaluation methods may vary.

**Prerequisite:** Graduate standing and special approval.

**Schedule Type:** Individual Investigation

**Contact Hours:** 1-3 other

**Grade Mode:** Standard Letter-IP