

DIGITAL SCIENCES - M.D.S.

College of Communication and Information

School of Digital Sciences
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 Kent Campus
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Description

The Master of Digital Sciences degree in Digital Sciences is designed to augment a student's skill set, opening the door to new career opportunities for students from diverse undergraduate backgrounds. Due to the program's interdisciplinary nature, students have a unique opportunity to gain a graduate-level introduction to several areas aligned with digital sciences.

The Digital Sciences major comprises the following concentrations:

- The **Data Science** concentration focuses on the data analysis and modeling needed by an organization and the processing of structured, semi-structured and unstructured data using statistical and semantic analysis techniques to meet those needs.
- The **Digital Systems Management** concentration focuses on the technical leadership needed by an organization and the management of information services in a rapidly changing global economy.
- The **Digital Systems Software Development** concentration focuses on the software applications needed by an organization and the design and maintenance of software systems that are aligned with the goals of the business.
- The **Digital Systems Telecommunication Networks** concentration focuses on the communication infrastructure needed by an organization and the design and management of a telecommunication system and computer network to meet those needs.
- The **Digital Systems Training Technology** concentration focuses on the educational applications needed by an organization and the design and management of instructional systems to meet those needs.
- The **Enterprise Architecture** concentration focuses on the business goals, processes and technology infrastructure needed by an organization and the alignment of the processes and infrastructure with the goals of the business.

Fully Offered At:

- Online (Data Science, Digital Systems Training Technology, Enterprise Architecture concentrations only)
- Kent Campus

Admission Requirements

- Bachelor's degree from an accredited college or university for unconditional admission
- Minimum 3.000 undergraduate GPA on a 4.000 point scale¹ for unconditional admission
- Official transcript(s)
- GRE scores²

- Résumé
- Goal statement³
- Three letters of recommendation
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning one of the following:
 - Minimum 550 TOEFL PBT score (paper-based version)
 - Minimum 79 TOEFL IBT score (Internet-based version)
 - Minimum 77 MELAB score
 - Minimum 6.5 IELTS score
 - Minimum 58 PTE score

For more information about graduate admissions, please visit the Graduate Studies website. For more information on international admission, visit the Office of Global Education website.

- ¹ Applicants with a lower GPA will be considered for conditional admission.
- ² GRE scores will be one of the factors considered in the admission process. A GRE composite score of 290 and above is preferred. The GRE may be waived if the applicant has earned a master's or higher degrees from an accredited U.S. institution or has three or more years of relevant, full-time work experience.
- ³ The goal statement should explain applicants' goals and objectives for pursuing this advanced degree. For example, applicants may want to better prepare for a particular career, to update knowledge in a specific area or to add expertise that will make them more valuable in a current career. In addition, applicants may submit a statement of plans for electives, which should explain how they plan to choose the digital sciences-related electives to complement their declared concentration and their undergraduate major. Applicants should explain how the electives will help to meet the goals and objectives listed in the their goal statement.

Program Learning Outcomes

Graduates of this program will be able to:

1. Augment their professional preparation with material from areas of digital sciences outside their former college and professional boundaries.
2. Demonstrate increased breadth in digital sciences outside their former college and professional boundaries.
3. Demonstrate basic familiarity with enterprise architecture, data science, software development, telecommunication networks, globalization and technology strategy and/or instructional design.
4. Demonstrate increased depth in one area of digital sciences.

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements		
Major Electives, choose from the following:		9-10
CS 61002	ALGORITHMS AND PROGRAMMING I	
DSCI 61010	ENTERPRISE ARCHITECTURE	
DSCI 64210	DATA SCIENCE	
ETEC 57403	INSTRUCTIONAL DESIGN	
MIS 64050	ESSENTIALS OF BUSINESS MGMT	

TECH 56350	NETWORK MANAGEMENT AND DESIGN TECHNOLOGY	GEOG 59163	CARTOGRAPHY AND GEOVISUALIZATION LABORATORY	
Culminating Requirement, choose from the following: ¹		6	GEOG 69007	SPATIOTEMPORAL ANALYTICS
DSCI 60998	CAPSTONE PROJECT IN DIGITAL SCIENCES	GEOG 69082	CYBERGIS	
DSCI 69199	THESIS I	GEOG 69083	GEODATABASES	
Approved Electives, choose from the following: ²		6-8	HI 60401	HEALTH INFORMATICS MANAGEMENT
COMM 65661	COMMUNICATION IN AN INFORMATION SOCIETY	HI 60402	LEGAL ISSUES IN HEALTH INFORMATICS	
COMM 65675	COMMUNICATION, UNCERTAINTY AND PRIVACY MANAGEMENT	HI 60403	HEALTH INFORMATION SYSTEMS	
COMM 65685	COMMUNICATION AND COGNITION	HI 60410	HEALTH RECORDS MANAGEMENT	
COMM 65851	ORGANIZATIONAL COMMUNICATION	HI 60411	CLINICAL ANALYTICS	
CS 53203	SYSTEMS PROGRAMMING ³	HI 60412	CLINICAL DECISION SUPPORT	
CS 53401	SECURE PROGRAMMING ³	ETEC 57427	TECHNOLOGY AND LEARNING	
CS 56101	DESIGN AND ANALYSIS OF ALGORITHMS ³	ETEC 57403	INSTRUCTIONAL DESIGN	
CS 57205	INFORMATION SECURITY ³	ETEC 67410	SIMULATIONS AND GAMES IN EDUCATION	
CS 57221	INTRODUCTION TO CRYPTOLOGY ³	ETEC 67425	MANAGING TECHNOLOGICAL CHANGE	
CS 61002	ALGORITHMS AND PROGRAMMING I	ETEC 67432	DESIGNING MULTIMEDIA FOR EDUCATION	
CS 61003	ALGORITHMS AND PROGRAMMING II	ETEC 67435	VIRTUAL AND AUGMENTED REALITY	
CS 63005	ADVANCED DATABASE SYSTEMS DESIGN ³	ETEC 67442	DESIGNING ONLINE AND BLENDED COURSES	
CS 63201	ADVANCED OPERATING SYSTEMS ³	ETEC 67444	TEACHING ONLINE AND BLENDED COURSES	
CS 63301	PARALLEL AND DISTRIBUTED COMPUTING ³	ETEC 67449	RESEARCH IN ONLINE AND BLENDED LEARNING	
CS 63304	CLUSTER COMPUTING ³	KM 60301	FOUNDATIONAL PRINCIPLES OF KNOWLEDGE MANAGEMENT	
CS 63901	SOFTWARE ENGINEERING METHODOLOGIES	KM 60305	COMMUNITIES OF PRACTICE	
CS 64201	ADVANCED ARTIFICIAL INTELLIGENCE ³	KM 60311	BUSINESS PROCESS MANAGEMENT	
CS 64401	IMAGE PROCESSING ³	KM 60312	BUSINESS INTELLIGENCE-COMPETITIVE INTELLIGENCE	
CS 67101	ADVANCED COMPUTER GRAPHICS ³	KM 60315	FOUNDATIONS OF DOCUMENT MANAGEMENT	
CS 67301	SCIENTIFIC VISUALIZATION ³	KM 60316	ORGANIZATIONAL CULTURE ASSESSMENT	
DSCI 51510	PROJECT MANAGEMENT AND TEAM DYNAMICS	KM 60370	SEMANTIC ANALYSIS METHODS AND TECHNOLOGIES	
DSCI 51610	DIGITAL SYSTEMS SECURITY	LIS 60613	INFORMATION NEEDS, SEEKING AND USE	
DSCI 59910	EMERGING TECHNOLOGIES IN DIGITAL SCIENCES	LIS 60636	KNOWLEDGE ORGANIZATION STRUCTURES, SYSTEMS AND SERVICES	
DSCI 59995	SPECIAL TOPICS IN DIGITAL SCIENCES	LIS 60637	METADATA ARCHITECTURE AND IMPLEMENTATION	
DSCI 60998	CAPSTONE PROJECT IN DIGITAL SCIENCES	LIS 60638	DIGITAL LIBRARIES	
DSCI 61010	ENTERPRISE ARCHITECTURE	LIS 60644	INFORMATION SCIENCE	
DSCI 61310	ENTERPRISE ARCHITECTURE: ENTERPRISE ARCHITECTURE CENTER OF EXCELLENCE METHODOLOGY	LIS 60645	DATABASE SYSTEMS	
DSCI 61510	PROJECT MANAGEMENT LEADERSHIP	MIS 64042	GLOBALIZATION AND TECHNOLOGY STRATEGY	
DSCI 62010	BUSINESS ARCHITECTURE	MIS 64050	ESSENTIALS OF BUSINESS MGMT	
DSCI 62210	WEB DEVELOPMENT IN DIGITAL SCIENCES	MIS 64080	EMERGING HARDWARE AND SOFTWARE TECHNOLOGIES	
DSCI 64010	DATA ARCHITECTURE	MIS 64081	DATA COMMUNICATIONS AND NETWORKING IN BUSINESS	
DSCI 64210	DATA SCIENCE	MIS 64082	DATABASE MANAGEMENT AND DATABASE ANALYTICS	
DSCI 65010	APPLICATION AND TECHNOLOGY ARCHITECTURE	MIS 64083	INFORMATION SECURITY: A MANAGERIAL PERSPECTIVE	
DSCI 69992	INTERNSHIP IN DIGITAL SCIENCES ⁴	MIS 64158	LEADERSHIP AND MANAGERIAL ASSESSMENT	
DSCI 69995	SPECIAL TOPICS IN DIGITAL SCIENCES	TECH 53222	COMPUTER HARDWARE ENGINEERING AND ARCHITECTURE	
DSCI 69996	INDIVIDUAL INVESTIGATION IN DIGITAL SCIENCES	TECH 56330	VISUAL BASIC PROGRAMMING IN ENGINEERING TECHNOLOGY	
EVAL 65510	STATISTICS I FOR EDUCATIONAL SERVICES	TECH 56350	NETWORK MANAGEMENT AND DESIGN TECHNOLOGY	
GEOG 59070	GEOGRAPHIC INFORMATION SCIENCE	TECH 56411	REQUIREMENTS ENGINEERING AND ANALYSIS TECHNOLOGY	
GEOG 59076	SPATIAL PROGRAMMING			
GEOG 59080	ADVANCED GEOGRAPHIC INFORMATION SCIENCE			
GEOG 59085	WEB AND MOBILE GEOGRAPHIC INFORMATION SCIENCE			
GEOG 59162	CARTOGRAPHY AND GEOVISUALIZATION			

TECH 63010	COMPUTER HARDWARE
TECH 63020	FIBER OPTIC SYSTEMS
TECH 63031	PROGRAMMABLE LOGIC CONTROLLERS
TECH 63032	ADVANCED PROGRAMMABLE LOGIC CONTROLLERS
TECH 63050	TRIZ-THEORY OF INVENTIVE PROBLEM SOLVING
TECH 64312	ADVANCED WIRELESS TELECOMMUNICATION SYSTEM AND NETWORK TECHNOLOGIES
TECH 65330	ADVANCED VISUAL BASIC PROGRAMMING IN ENGINEERING TECHNOLOGY
TECH 66380	ADVANCED NETWORKING
VCD 55000	GRAPHIC DESIGN PERSPECTIVES
VCD 60121	USER EXPERIENCE DESIGN IN PRACTICE
UXD 60001	USER EXPERIENCE DESIGN PRINCIPLES AND CONCEPTS
UXD 60002	USER EXPERIENCE DESIGN IN PRACTICE
UXD 60101	INFORMATION ARCHITECTURE I
UXD 60103	RESEARCHING THE USER EXPERIENCE I
UXD 60104	USABILITY I
UXD 60113	RESEARCHING USER EXPERIENCE II
UXD 60114	USABILITY II

Concentrations

Choose from the following:	9-10
Data Science	
Digital Systems Management	
Digital Systems Software Development	
Digital Systems Telecommunication Networks	
Digital Systems Training Technology	
Enterprise Architecture	

Minimum Total Credit Hours: 32

- ¹ Whether selecting the capstone project or thesis, students must complete minimum 6 credit hours. Students selecting the capstone project must select additional Digital Sciences electives to fulfill the 6 credit hours.
- ² Requests for consideration of other courses as approved electives should be submitted to the student's advisor in the School of Digital Sciences.
- ³ This course is recommended only for students from a computer science background.
- ⁴ No more than 3 credit hours of DSCI 69992 may be applied toward approved electives in the M.D.S. degree.

Data Science Concentration Requirements

[MDS-DS-DATA]

Code	Title	Credit Hours
Concentration Requirements		
DSCI 64010	DATA ARCHITECTURE	3
KM 60370	SEMANTIC ANALYSIS METHODS AND TECHNOLOGIES	3
LIS 60636	KNOWLEDGE ORGANIZATION STRUCTURES, SYSTEMS AND SERVICES	3

Minimum Total Credit Hours: 9

Digital Systems Management Concentration Requirements

[MDS-DS-DSMT]

Code	Title	Credit Hours
Concentration Requirements		
DSCI 51510	PROJECT MANAGEMENT AND TEAM DYNAMICS	3
or DSCI 51610	DIGITAL SYSTEMS SECURITY	
or MIS 64083	INFORMATION SECURITY: A MANAGERIAL PERSPECTIVE	
MIS 64042	GLOBALIZATION AND TECHNOLOGY STRATEGY	2
MIS 64080	EMERGING HARDWARE AND SOFTWARE TECHNOLOGIES	3
MIS 64158	LEADERSHIP AND MANAGERIAL ASSESSMENT	2

Minimum Total Credit Hours: 10

Digital Systems Software Development Concentration Requirements

[MDS-DS-DSSD]

Code	Title	Credit Hours
Concentration Requirements		
CS 61003	ALGORITHMS AND PROGRAMMING II ¹	4
CS 63901	SOFTWARE ENGINEERING METHODOLOGIES ²	3
or DSCI 51510	PROJECT MANAGEMENT AND TEAM DYNAMICS	
or MIS 64082	DATABASE MANAGEMENT AND DATABASE ANALYTICS	
DSCI 65010	APPLICATION AND TECHNOLOGY ARCHITECTURE	3

Minimum Total Credit Hours: 10

- ¹ CS 61003 May be replaced by another Computer Science (CS) course on the Approved Elective list for students with an undergraduate degree in computer science.
- ² CS 63901 or DSCI 51510 is recommended for students from a computer science background. MIS 64082 is recommended for students from a non-computer science background.

Digital Systems Telecommunication Networks Concentration Requirements

[MDS-DS-DSTN]

Code	Title	Credit Hours
Concentration Requirements		
TECH 56411	REQUIREMENTS ENGINEERING AND ANALYSIS TECHNOLOGY	3
TECH 64312	ADVANCED WIRELESS TELECOMMUNICATION SYSTEM AND NETWORK TECHNOLOGIES	3
TECH 66380	ADVANCED NETWORKING	3

Minimum Total Credit Hours: 9

Digital Systems Training Technology Concentration Requirements

[MDS-DS-DSTT]

Code	Title	Credit Hours
Concentration Requirements		
ETEC 67410	SIMULATIONS AND GAMES IN EDUCATION	3
or ETEC 67435	VIRTUAL AND AUGMENTED REALITY	
ETEC 67425	MANAGING TECHNOLOGICAL CHANGE	3
ETEC 67432	DESIGNING MULTIMEDIA FOR EDUCATION	3
Minimum Total Credit Hours:		9

Enterprise Architecture Concentration Requirements

[MDS-DS-ENAR]

Code	Title	Credit Hours
Concentration Requirements		
DSCI 62010	BUSINESS ARCHITECTURE	3
DSCI 64010	DATA ARCHITECTURE	3
DSCI 65010	APPLICATION AND TECHNOLOGY ARCHITECTURE	3
Minimum Total Credit Hours:		9

Graduation Requirements

No more than 18 credits may be taken from any one subject area other than Digital Sciences to apply toward the M.D.S. degree.