DIGITAL SCIENCES - M.D.S.

College of Communication and Information
School of Digital Sciences
129 Taylor Hall
Kent Campus
330-672-9105
digital-science@kent.edu
www.kent.edu/dsci

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
- Minimum 3.00 undergraduate GPA on a 4.00 point scale
- Official transcript(s)
- GRE scores
- Résumé
- Goal statement

- 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 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

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td></td>
<td>Major Requirements</td>
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<tr>
<td>DSCI 60998</td>
<td>CAPSTONE PROJECT IN DIGITAL SCIENCES</td>
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<tr>
<td>or DSCI 69199</td>
<td>THESIS I</td>
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<td>Major Electives, choose from the following:</td>
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<tr>
<td>CS 61002</td>
<td>ALGORITHMS AND PROGRAMMING I</td>
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<tr>
<td>DSCI 61010</td>
<td>ENTERPRISE ARCHITECTURE</td>
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<tr>
<td>DSCI 64210</td>
<td>DATA SCIENCE</td>
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<tr>
<td>ETEC 57403</td>
<td>INSTRUCTIONAL DESIGN</td>
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<tr>
<td>MIS 64050</td>
<td>ESSENTIALS OF BUSINESS MGMT</td>
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</table>
Approved Electives, choose from the following: 2 6-8

COMM 65661 COMMUNICATION IN AN INFORMATION SOCIETY
COMM 65675 COMMUNICATION, UNCERTAINTY AND PRIVACY MANAGEMENT
COMM 65685 COMMUNICATION AND COGNITION
COMM 65851 ORGANIZATIONAL COMMUNICATION
CS 53203 SYSTEMS PROGRAMMING 3
CS 53401 SECURE PROGRAMMING 3
CS 56101 DESIGN AND ANALYSIS OF ALGORITHMS 3
CS 57205 INFORMATION SECURITY 3
CS 57221 INTRODUCTION TO CRYPTOLOGY 3
CS 61002 ALGORITHMS AND PROGRAMMING I
CS 61003 ALGORITHMS AND PROGRAMMING II
CS 63005 ADVANCED DATABASE SYSTEMS DESIGN 3
CS 63201 ADVANCED OPERATING SYSTEMS 3
CS 63301 PARALLEL AND DISTRIBUTED COMPUTING 3
CS 63304 CLUSTER COMPUTING 3
CS 63901 SOFTWARE ENGINEERING METHODOLOGIES
CS 64201 ADVANCED ARTIFICIAL INTELLIGENCE 3
CS 64401 IMAGE PROCESSING 3
CS 67101 ADVANCED COMPUTER GRAPHICS 3
CS 67301 SCIENTIFIC VISUALIZATION 3
DSCI 51510 PROJECT MANAGEMENT AND TEAM DYNAMICS
DSCI 51610 DIGITAL SYSTEMS SECURITY
DSCI 59910 SPECIAL TOPICS IN DIGITAL SCIENCES
DSCI 60998 CAPSTONE PROJECT IN DIGITAL SCIENCES
DSCI 61010 ENTERPRISE ARCHITECTURE
DSCI 61310 ENTERPRISE ARCHITECTURE: ENTERPRISE ARCHITECTURE CENTER OF EXCELLENCE METHODOLOGY
DSCI 61510 PROJECT MANAGEMENT LEADERSHIP
DSCI 62010 BUSINESS ARCHITECTURE
DSCI 62210 WEB DEVELOPMENT IN DIGITAL SCIENCES
DSCI 64010 DATA ARCHITECTURE
DSCI 64210 DATA SCIENCE
DSCI 65010 APPLICATION AND TECHNOLOGY ARCHITECTURE
DSCI 69992 INTERNSHIP IN DIGITAL SCIENCES 4
DSCI 69995 SPECIAL TOPICS IN DIGITAL SCIENCES
DSCI 69996 INDIVIDUAL INVESTIGATION IN DIGITAL SCIENCES
EVAL 65510 STATISTICS I FOR EDUCATIONAL SERVICES
GEOG 59070 GEOGRAPHIC INFORMATION SCIENCE
GEOG 59076 SPATIAL PROGRAMMING
GEOG 59080 ADVANCED GEOGRAPHIC INFORMATION SCIENCE
GEOG 59085 WEB AND MOBILE GEOGRAPHIC INFORMATION SCIENCE
GEOG 59162 CARTOGRAPHY AND GEOPROCESSING
GEOG 59163 CARTOGRAPHY AND GEOPROCESSING LABORATORY
GEOG 69007 SPATIOTEMPORAL ANALYTICS
GEOG 69082 CYBERGIS
GEOG 69083 GEODATABASES
HI 60401 HEALTH INFORMATICS MANAGEMENT
HI 60402 LEGAL ISSUES IN HEALTH INFORMATICS
HI 60403 HEALTH INFORMATION SYSTEMS
HI 60410 HEALTH RECORDS MANAGEMENT
HI 60411 CLINICAL ANALYTICS
HI 60412 CLINICAL DECISION SUPPORT
ETEC 57427 TECHNOLOGY AND LEARNING
ETEC 57403 INSTRUCTIONAL DESIGN
ETEC 67410 SIMULATIONS AND GAMES IN EDUCATION
ETEC 67425 MANAGING TECHNOLOGICAL CHANGE
ETEC 67432 DESIGNING MULTIMEDIA FOR EDUCATION
ETEC 67435 VIRTUAL AND AUGMENTED REALITY
ETEC 67442 DESIGNING ONLINE AND BLENDED COURSES
ETEC 67444 TEACHING ONLINE AND BLENDED COURSES
ETEC 67449 RESEARCH IN ONLINE AND BLENDED LEARNING
KM 60301 FOUNDATIONAL PRINCIPLES OF KNOWLEDGE MANAGEMENT
KM 60305 COMMUNITIES OF PRACTICE
KM 60311 BUSINESS PROCESS MANAGEMENT
KM 60312 BUSINESS INTELLIGENCE-COMPETITIVE INTELLIGENCE
KM 60315 FOUNDATIONS OF DOCUMENT MANAGEMENT
KM 60316 ORGANIZATIONAL CULTURE ASSESSMENT
KM 60370 SEMANTIC ANALYSIS METHODS AND TECHNOLOGIES
LIS 60613 INFORMATION NEEDS, SEEKING AND USE
LIS 60636 KNOWLEDGE ORGANIZATION STRUCTURES, SYSTEMS AND SERVICES
LIS 60637 METADATA ARCHITECTURE AND IMPLEMENTATION
LIS 60638 DIGITAL LIBRARIES
LIS 60644 INFORMATION SCIENCE
LIS 60645 DATABASE SYSTEMS
MIS 64042 GLOBALIZATION AND TECHNOLOGY STRATEGY
MIS 64050 ESSENTIALS OF BUSINESS MGMT
MIS 64080 EMERGING HARDWARE AND SOFTWARE TECHNOLOGIES
MIS 64081 DATA COMMUNICATIONS AND NETWORKING IN BUSINESS
MIS 64082 DATABASE MANAGEMENT AND DATABASE ANALYTICS
MIS 64083 INFORMATION SECURITY: A MANAGERIAL PERSPECTIVE
MIS 64158 LEADERSHIP AND MANAGERIAL ASSESSMENT
TECH 53222 COMPUTER HARDWARE ENGINEERING AND ARCHITECTURE
TECH 56330 VISUAL BASIC PROGRAMMING IN ENGINEERING TECHNOLOGY
TECH 56350 NETWORK MANAGEMENT AND DESIGN TECHNOLOGY
TECH 56411 REQUIREMENTS ENGINEERING AND ANALYSIS TECHNOLOGY
TECH 63010 COMPUTER HARDWARE
TECH 63020 FIBER OPTIC SYSTEMS
TECH 63031 PROGRAMMABLE LOGIC CONTROLLERS
<table>
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<tr>
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<tr>
<td>TECH 63032</td>
<td>ADVANCED PROGRAMMABLE LOGIC CONTROLLERS</td>
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<td>TECH 63050</td>
<td>TRIZ-THEORY OF INVENTIVE PROBLEM SOLVING</td>
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<td>TECH 64312</td>
<td>ADVANCED WIRELESS TELECOMMUNICATION SYSTEM AND NETWORK TECHNOLOGIES</td>
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<td>TECH 65330</td>
<td>ADVANCED VISUAL BASIC PROGRAMMING IN ENGINEERING TECHNOLOGY</td>
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<td>TECH 66380</td>
<td>ADVANCED NETWORKING</td>
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<td>VCD 55000</td>
<td>GRAPHIC DESIGN PERSPECTIVES</td>
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<td>VCD 60121</td>
<td>USER EXPERIENCE DESIGN IN PRACTICE</td>
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<td>UXD 60001</td>
<td>USER EXPERIENCE DESIGN PRINCIPLES AND CONCEPTS</td>
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<td>UXD 60002</td>
<td>USER EXPERIENCE DESIGN IN PRACTICE</td>
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<td>UXD 60010</td>
<td>INFORMATION ARCHITECTURE I</td>
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<td>RESEARCHING THE USER EXPERIENCE I</td>
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<td>UXD 60104</td>
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<td>UXD 60113</td>
<td>RESEARCHING USER EXPERIENCE II</td>
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<tr>
<td>UXD 60114</td>
<td>USABILITY II</td>
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**Concentrations**

Choose from the following:

- 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]**

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<tr>
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<tr>
<td>DSCI 64010</td>
<td>DATA ARCHITECTURE</td>
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<td>KM 60370</td>
<td>SEMANTIC ANALYSIS METHODS AND TECHNOLOGIES</td>
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<tr>
<td>LIS 60636</td>
<td>KNOWLEDGE ORGANIZATION STRUCTURES, SYSTEMS AND SERVICES</td>
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**Minimum Total Credit Hours:** 9

**Digital Systems Management Concentration Requirements**

**[MDS-DS-DSMT]**

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<tr>
<td>TECH 56411</td>
<td>REQUIREMENTS ENGINEERING AND ANALYSIS TECHNOLOGY</td>
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<tr>
<td>TECH 64312</td>
<td>ADVANCED WIRELESS TELECOMMUNICATION SYSTEM AND NETWORK TECHNOLOGIES</td>
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<tr>
<td>TECH 66380</td>
<td>ADVANCED NETWORKING</td>
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**Minimum Total Credit Hours:** 9

**Digital Systems Software Development Concentration Requirements**

**[MDS-DS-DSSD]**

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<thead>
<tr>
<th>Code</th>
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<tr>
<td>CS 61003</td>
<td>ALGORITHMS AND PROGRAMMING II 1</td>
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<tr>
<td>CS 63901</td>
<td>SOFTWARE ENGINEERING METHODOLOGIES 2</td>
<td>3</td>
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<tr>
<td>DSCI 65010</td>
<td>APPLICATION AND TECHNOLOGY ARCHITECTURE</td>
<td>3</td>
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</table>

**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]**

**Digital Systems Training Technology Concentration Requirements**

**[MDS-DS-DSTT]**
ETEC 67432  DESIGNING MULTIMEDIA FOR EDUCATION  3
Minimum Total Credit Hours:  9

Enterprise Architecture Concentration Requirements
[MDS-DS-ENAR]

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<tr>
<th>Code</th>
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<td>DSCI 62010</td>
<td>BUSINESS ARCHITECTURE</td>
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<tr>
<td>DSCI 64010</td>
<td>DATA ARCHITECTURE</td>
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</tr>
<tr>
<td>DSCI 65010</td>
<td>APPLICATION AND TECHNOLOGY ARCHITECTURE</td>
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</table>

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.