DIGITAL SCIENCES - M.D.S.

College of Communication and Information
School of Digital Sciences
314 University Library
Kent Campus
330-672-9105
dsci@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 for unconditional admission
- Minimum 3.000 undergraduate GPA on a 4.000 point scale\(^1\) for unconditional admission
- Official transcript(s)
- GRE scores\(^2\)
- Résumé
- Goal statement\(^3\)
- 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 550 TOEFL PBT score (paper-based version)

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>
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<th>Credit Hours</th>
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<tbody>
<tr>
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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>
<tr>
<td>DSCI 64210</td>
<td>DATA SCIENCE</td>
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### Digital Sciences - M.D.S.

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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>
</tr>
<tr>
<td>TECH 56350</td>
<td>NETWORK MANAGEMENT AND DESIGN TECHNOLOGY</td>
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**Culminating Requirement, choose from the following:**

- DSCI 60998  | CAPSTONE PROJECT IN DIGITAL SCIENCES |
- DSCI 69199  | THESIS I |

**Approved Electives, choose from the following:**

- COMM 65661  | COMMUNICATION IN AN INFORMATION SOCIETY |
- COMM 65675  | COMMUNICATION, UNCERTAINTY AND PRIVACY MANAGEMENT |
- COMM 65685  | 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  | EMERGING TECHNOLOGIES IN DIGITAL SCIENCES |
- DSCI 59995  | 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 GEOVISUALIZATION |
- GEOG 59163  | CARTOGRAPHY AND GEOVISUALIZATION LABORATORY |
- GEOG 69007  | SPATIOTEMPORAL ANALYTICS |
- GEOG 69082  | CYBERGIS |
- GEOG 69083  | GEDATABASES |
- 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 DESIGN AND APPLICATIONS |
- 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 |
<table>
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<th>Code</th>
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<th>Credit Hours</th>
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<tr>
<td>TECH 56350</td>
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<td>TECH 56411</td>
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<td>TECH 63010</td>
<td>COMPUTER HARDWARE</td>
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<td>TECH 63020</td>
<td>FIBER OPTIC SYSTEMS</td>
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<td>TECH 63031</td>
<td>PROGRAMMABLE LOGIC CONTROLLERS</td>
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<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>UXD 60001</td>
<td>USER EXPERIENCE DESIGN PRINCIPLES AND CONCEPTS</td>
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<td>UXD 60104</td>
<td>USABILITY I</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:** 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

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<th>Credit Hours</th>
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<tr>
<td>DSCI 64010</td>
<td>DATA ARCHITECTURE</td>
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<tr>
<td>KM 60370</td>
<td>SEMANTIC ANALYSIS METHODS AND TECHNOLOGIES</td>
<td>3</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

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### Digital Systems Management Concentration Requirements

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<tr>
<td>DSCI 51510</td>
<td>PROJECT MANAGEMENT AND TEAM DYNAMICS</td>
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<tr>
<td>or DSCI 51610</td>
<td>DIGITAL SYSTEMS SECURITY</td>
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<tr>
<td>or MIS 64083</td>
<td>INFORMATION SECURITY: A MANAGERIAL PERSPECTIVE</td>
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<tr>
<td>MIS 64042</td>
<td>GLOBALIZATION AND TECHNOLOGY STRATEGY</td>
<td>2</td>
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<td>MIS 64080</td>
<td>EMERGING HARDWARE AND SOFTWARE TECHNOLOGIES</td>
<td>3</td>
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<tr>
<td>MIS 64158</td>
<td>LEADERSHIP AND MANAGERIAL ASSESSMENT</td>
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**Minimum Total Credit Hours:** 10

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### Digital Systems Software Development Concentration Requirements

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<tr>
<td>CS 61003</td>
<td>ALGORITHMS AND PROGRAMMING II ¹</td>
<td>4</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>or DSCI 51510</td>
<td>PROJECT MANAGEMENT AND TEAM DYNAMICS</td>
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<tr>
<td>or MIS 64082</td>
<td>DATABASE MANAGEMENT AND DATABASE ANALYTICS</td>
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<tr>
<td>DSCI 65010</td>
<td>APPLICATION AND TECHNOLOGY ARCHITECTURE</td>
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**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

<table>
<thead>
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<tbody>
<tr>
<td>TECH 56411</td>
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<td>TECH 64312</td>
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<td>TECH 66380</td>
<td>ADVANCED NETWORKING</td>
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**Minimum Total Credit Hours:** 9

### Digital Systems Training Technology Concentration Requirements

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<td>SIMULATIONS AND GAMES IN EDUCATION</td>
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<tr>
<td>or ETEC 67435</td>
<td>VIRTUAL AND AUGMENTED REALITY</td>
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<tr>
<td>ETEC 67425</td>
<td>MANAGING TECHNOLOGICAL CHANGE</td>
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ETEC 67432 DESIGNING MULTIMEDIA FOR EDUCATION 3
Minimum Total Credit Hours: 9

**Enterprise Architecture Concentration Requirements**

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<td>DATA ARCHITECTURE</td>
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<tr>
<td>DSCI 65010</td>
<td>APPLICATION AND TECHNOLOGY ARCHITECTURE</td>
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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.