DIGITAL SCIENCES - M.D.S.

College of Communication and Information
School of Digital Sciences
129 Taylor Hall
Kent Campus
330-672-9105
digital-sciences@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.

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CS 61002</td>
<td>ALGORITHMS AND PROGRAMMING I</td>
<td>9-10</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>
<td></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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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 for unconditional admission
- 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
- Demonstrated increased breadth in digital sciences outside their former college and professional boundaries.
- Demonstrated increased depth in one area of digital sciences.
Culminating Requirement, choose from the following:  
1. DSCI 60998 CAPSTONE PROJECT IN DIGITAL SCIENCES  
2. DSCI 69199 THESIS I  

Approved Electives, choose from the following:  
6-8  
1. COMM 65661 COMMUNICATION IN AN INFORMATION SOCIETY  
2. COMM 65675 COMMUNICATION, UNCERTAINTY AND PRIVACY MANAGEMENT  
3. COMM 65685 COMMUNICATION AND COGNITION  
4. COMM 65851 ORGANIZATIONAL COMMUNICATION  
5. CS 53203 SYSTEMS PROGRAMMING  
6. CS 53401 SECURE PROGRAMMING  
7. CS 56101 DESIGN AND ANALYSIS OF ALGORITHMS  
8. CS 57205 INFORMATION SECURITY  
9. CS 57221 INTRODUCTION TO CRYPTOLOGY  
10. CS 61002 ALGORITHMS AND PROGRAMMING I  
11. CS 61003 ALGORITHMS AND PROGRAMMING II  
12. CS 63005 ADVANCED DATABASE SYSTEMS DESIGN  
13. CS 63201 ADVANCED OPERATING SYSTEMS  
14. CS 63301 PARALLEL AND DISTRIBUTED COMPUTING  
15. CS 63304 CLUSTER COMPUTING  
16. CS 63901 SOFTWARE ENGINEERING METHODOLOGIES  
17. CS 64201 ADVANCED ARTIFICIAL INTELLIGENCE  
18. CS 64401 IMAGE PROCESSING  
19. CS 67101 ADVANCED COMPUTER GRAPHICS  
20. CS 67301 SCIENTIFIC VISUALIZATION  
21. DSCI 51510 PROJECT MANAGEMENT AND TEAM DYNAMICS  
22. DSCI 51610 DIGITAL SYSTEMS SECURITY  
23. DSCI 59910 EMERGING TECHNOLOGIES IN DIGITAL SCIENCES  
24. DSCI 59995 SPECIAL TOPICS IN DIGITAL SCIENCES  
25. DSCI 60998 CAPSTONE PROJECT IN DIGITAL SCIENCES  
26. DSCI 61010 ENTERPRISE ARCHITECTURE  
27. DSCI 61310 ENTERPRISE ARCHITECTURE: ENTERPRISE ARCHITECTURE CENTER OF EXCELLENCE METHODOLOGY  
28. DSCI 61510 PROJECT MANAGEMENT LEADERSHIP  
29. DSCI 62010 BUSINESS ARCHITECTURE  
30. DSCI 62210 WEB DEVELOPMENT IN DIGITAL SCIENCES  
31. DSCI 64010 DATA ARCHITECTURE  
32. DSCI 64210 DATA SCIENCE  
33. DSCI 65010 APPLICATION AND TECHNOLOGY ARCHITECTURE  
34. DSCI 69992 INTERNSHIP IN DIGITAL SCIENCES  
35. DSCI 69995 SPECIAL TOPICS IN DIGITAL SCIENCES  
36. DSCI 69996 INDIVIDUAL INVESTIGATION IN DIGITAL SCIENCES  
37. EVAL 65510 STATISTICS I FOR EDUCATIONAL SERVICES  
38. GEOG 59070 GEOGRAPHIC INFORMATION SCIENCE  
39. GEOG 59076 SPATIAL PROGRAMMING  
40. GEOG 59080 ADVANCED GEOGRAPHIC INFORMATION SCIENCE  
41. GEOG 59085 WEB AND MOBILE GEOGRAPHIC INFORMATION SCIENCE  
42. GEOG 59162 CARTOGRAPHY AND GEOVISUALIZATION  
43. GEOG 59163 CARTOGRAPHY AND GEOVISUALIZATION LABORATORY  
44. GEOG 69007 SPATIAL TEMPORAL ANALYTICS  
45. GEOG 69082 CYBERGIS  
46. GEOG 69083 GEO DATABASES  
47. HI 60401 HEALTH INFORMATICS MANAGEMENT  
48. HI 60402 LEGAL ISSUES IN HEALTH INFORMATICS  
49. HI 60403 HEALTH INFORMATION SYSTEMS  
50. HI 60410 HEALTH RECORDS MANAGEMENT  
51. HI 60411 CLINICAL ANALYTICS  
52. HI 60412 CLINICAL DECISION SUPPORT  
53. ETEC 57427 TECHNOLOGY AND LEARNING  
54. ETEC 57432 DESIGNING MULTIMEDIA FOR EDUCATION  
55. ETEC 57435 VIRTUAL AND AUGMENTED REALITY  
56. ETEC 57442 DESIGNING ONLINE AND BLENDED COURSES  
57. ETEC 57444 TEACHING ONLINE AND BLENDED COURSES  
58. ETEC 57449 RESEARCH IN ONLINE AND BLENDED LEARNING  
59. KM 60301 FOUNDATIONAL PRINCIPLES OF KNOWLEDGE MANAGEMENT  
60. KM 60305 COMMUNITIES OF PRACTICE  
61. KM 60311 BUSINESS PROCESS MANAGEMENT  
62. KM 60312 BUSINESS INTELLIGENCE-COMPETITIVE INTELLIGENCE  
63. KM 60315 FOUNDATIONS OF DOCUMENT MANAGEMENT  
64. KM 60316 ORGANIZATIONAL CULTURE ASSESSMENT  
65. KM 60370 SEMANTIC ANALYSIS METHODS AND TECHNOLOGIES  
66. LIS 60613 INFORMATION NEEDS, SEEKING AND USE  
67. LIS 60636 KNOWLEDGE ORGANIZATION STRUCTURES, SYSTEMS AND SERVICES  
68. LIS 60637 METADATA ARCHITECTURE AND IMPLEMENTATION  
69. LIS 60638 DIGITAL LIBRARIES  
70. LIS 60644 INFORMATION SCIENCE  
71. LIS 60645 DATABASE SYSTEMS  
72. MIS 64042 GLOBALIZATION AND TECHNOLOGY STRATEGY  
73. MIS 64050 ESSENTIALS OF BUSINESS MGMT  
74. MIS 64080 EMERGING HARDWARE AND SOFTWARE TECHNOLOGIES  
75. MIS 64081 DATA COMMUNICATIONS AND NETWORKING IN BUSINESS  
76. MIS 64082 DATABASE MANAGEMENT AND DATABASE ANALYTICS  
77. MIS 64083 INFORMATION SECURITY: A MANAGERIAL PERSPECTIVE  
78. MIS 64158 LEADERSHIP AND MANAGERIAL ASSESSMENT  
79. TECH 53222 COMPUTER HARDWARE ENGINEERING AND ARCHITECTURE  
80. TECH 56330 VISUAL BASIC PROGRAMMING IN ENGINEERING TECHNOLOGY  
81. TECH 56350 NETWORK MANAGEMENT AND DESIGN TECHNOLOGY  
82. TECH 56411 REQUIREMENTS ENGINEERING AND ANALYSIS TECHNOLOGY
Digital Sciences - M.D.S.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>TECH 63010</td>
<td>COMPUTER HARDWARE</td>
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<tr>
<td>TECH 63020</td>
<td>FIBER OPTIC SYSTEMS</td>
<td>3</td>
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<tr>
<td>TECH 63031</td>
<td>PROGRAMMABLE LOGIC CONTROLLERS</td>
<td>3</td>
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<tr>
<td>TECH 63032</td>
<td>ADVANCED PROGRAMMABLE LOGIC CONTROLLERS</td>
<td>3</td>
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<tr>
<td>TECH 63050</td>
<td>TRIZ-THEORY OF INVENTIVE PROBLEM SOLVING</td>
<td>3</td>
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<tr>
<td>TECH 64312</td>
<td>ADVANCED WIRELESS TELECOMMUNICATION SYSTEM AND NETWORK TECHNOLOGIES</td>
<td>3</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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<tr>
<td>VCD 55000</td>
<td>GRAPHIC DESIGN PERSPECTIVES</td>
<td>3</td>
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<td>VCD 60121</td>
<td>USER EXPERIENCE DESIGN IN PRACTICE</td>
<td>3</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 60101</td>
<td>INFORMATION ARCHITECTURE I</td>
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<td>UXD 60103</td>
<td>RESEARCHING THE USER EXPERIENCE I</td>
<td>3</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

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>DSCI 64010</td>
<td>DATA ARCHITECTURE</td>
<td>3</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

Digital Systems Management Concentration Requirements

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<tbody>
<tr>
<td>DSCI 51510</td>
<td>PROJECT MANAGEMENT AND TEAM DYNAMICS</td>
<td>3</td>
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<tr>
<td>or DSCI 51610</td>
<td>DIGITAL SYSTEMS SECURITY</td>
<td>3</td>
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<tr>
<td>or MIS 64083</td>
<td>INFORMATION SECURITY: A MANAGERIAL PERSPECTIVE</td>
<td>2</td>
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<tr>
<td>MIS 64042</td>
<td>GLOBALIZATION AND TECHNOLOGY STRATEGY</td>
<td>2</td>
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<tr>
<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>
<td>2</td>
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Minimum Total Credit Hours: 10

Digital Systems Software Development Concentration Requirements

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>CS 61003</td>
<td>ALGORITHMS AND PROGRAMMING II</td>
<td>4</td>
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<tr>
<td>or DSCI 51510</td>
<td>PROJECT MANAGEMENT AND TEAM DYNAMICS</td>
<td>3</td>
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<tr>
<td>or MIS 64082</td>
<td>DATABASE MANAGEMENT AND DATABASE ANALYTICS</td>
<td>3</td>
</tr>
<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

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>TECH 56411</td>
<td>REQUIREMENTS ENGINEERING AND ANALYSIS TECHNOLOGY</td>
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<td>TECH 64312</td>
<td>ADVANCED WIRELESS TELECOMMUNICATION SYSTEM AND NETWORK TECHNOLOGIES</td>
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</tr>
<tr>
<td>TECH 66380</td>
<td>ADVANCED NETWORKING</td>
<td>3</td>
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Minimum Total Credit Hours: 9

Digital Systems Training Technology Concentration Requirements

<table>
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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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Minimum Total Credit Hours: 9
### Digital Sciences - M.D.S.

#### Concentration Requirements

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<tr>
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<th>Credit Hours</th>
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<tbody>
<tr>
<td>ETEC 67410</td>
<td>SIMULATIONS AND GAMES IN EDUCATION</td>
<td>3</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>
<td>3</td>
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<tr>
<td>ETEC 67432</td>
<td>DESIGNING MULTIMEDIA FOR EDUCATION</td>
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Minimum Total Credit Hours: 9

#### Enterprise Architecture Concentration Requirements

[MDS-DS-ENAR]

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<td>BUSINESS ARCHITECTURE</td>
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<tr>
<td>DSCI 64010</td>
<td>DATA ARCHITECTURE</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: 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.