# DATA ENGINEERING, MS

## REQUIREMENTS

## MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/ #policiesandrequirementstext), in addition to the program requirements listed below.

## MAJOR REQUIREMENTS MODE OF INSTRUCTION

| Face to Face | Evening/<br>Weekend | Online | Hybrid | Accelerated |
|--------------|---------------------|--------|--------|-------------|
| Yes          | No                  | No     | No     | Yes         |

#### **Mode of Instruction Definitions**

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

**Evening/Weekend:** Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face:** Courses typically meet during weekdays on the UW-Madison Campus.

**Hybrid:** These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online:** These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

### **CURRICULAR REQUIREMENTS**

#### **Requirement**: Detail

| Minimum<br>Credit<br>Requirement                 | 30 credits  |
|--|---|
| Minimum<br>Residence<br>Credit<br>Requirement    | 16 credits  |
| Minimum<br>Graduate<br>Coursework<br>Requirement | 15 credits must be graduate-level coursework. Refer to<br>the Graduate School: Minimum Graduate Coursework<br>(50%) Requirement policy: https://policy.wisc.edu/library/<br>UW-1244 (https://policy.wisc.edu/library/UW-1244/). |
| Overall<br>Graduate<br>GPA<br>Requirement        | 3.00 GPA required.<br>Refer to the Graduate School: Grade Point Average<br>(GPA) Requirement policy: https://policy.wisc.edu/library/<br>UW-1203 (https://policy.wisc.edu/library/UW-1203/).                                    |
| Other Grade<br>Requirements                      | None.   |

| Assessments  | None. |
|--------------|-------|
| and          |       |
| Examinations |       |
| Language     | None. |
| Requirements |       |

#### **REQUIRED COURSES**

| Co        | ode                                 | Title  | Credits |
|-----------|-------------------------------------|--|---------|
| Da        | ata Engineering Fo                  | oundations: Complete all classes.  | 12      |
|           | COMP SCI 739                        | Distributed Systems  |         |
|           | COMP SCI 744                        | Big Data Systems   |         |
|           | COMP SCI 764                        | Topics in Database Management<br>Systems                                   |         |
|           | COMP SCI 774                        | Data Exploration, Cleaning, and<br>Integration for Data Science            |         |
| М         | achine Learning R                   | equirement: Select a minimum of  | 6       |
| 2         | courses from the l                  | ist below.   |         |
|           | COMP SCI 540                        | Introduction to Artificial Intelligence                                    |         |
|           | COMP SCI/<br>E C E 760              | Machine Learning   |         |
|           | COMP SCI 762                        | Advanced Deep Learning   |         |
|           | STAT 451                            | Introduction to Machine Learning<br>and Statistical Pattern Classification |         |
|           | STAT 453                            | Introduction to Deep Learning and<br>Generative Models                     |         |
|           | STAT 615                            | Statistical Learning   |         |
| Al<br>cla | gorithms Require<br>ass from below. | ment: Select a minimum of one  | 3       |
|           | COMP SCI/E C E/<br>I SY E 524       | Introduction to Optimization   |         |
|           | COMP SCI 577                        | Introduction to Algorithms   |         |
|           | COMP SCI/I SY E/<br>MATH/STAT 726   | Nonlinear Optimization I   |         |
| Sy<br>fr  | rstems Requireme<br>om below.       | nt: Select a minimum of one class  | 3       |
|           | COMP SCI 407                        | Foundations of Mobile Systems and<br>Applications                          |         |
|           | COMP SCI 537                        | Introduction to Operating Systems  |         |
|           | COMP SCI 564                        | Database Management Systems:<br>Design and Implementation                  |         |
|           | COMP SCI 640                        | Introduction to Computer Networks  |         |
|           | COMP SCI/<br>E C E 707              | Mobile and Wireless Networking   |         |
|           | COMP SCI 740                        | Advanced Computer Networks   |         |
| H         | umans and Data Re                   | equirement: Select a minimum of  | 3       |
| or        | e class from below                  | N.   |         |
|           | COMP SCI 765                        | Data Visualization   |         |
|           | COMP SCI/<br>ED PSYCH/<br>PSYCH 770 | Human-Computer Interaction   |         |
| A         | oproved Electives                   | Select any course from above or  | 3       |
| fr        | om the list below.                  |  |         |
|           | COMP SCI 642                        | Introduction to Information Security                                       |         |
|           | COMP SCI 702                        | Graduate Cooperative Education <sup>1</sup>                                |         |
|           | COMP SCI 790                        | Master's Thesis <sup>1</sup>   |         |

#### 2 Data Engineering, MS

| Total | Credits     |  | 30 |
|-------|-------------|--|----|
| ST    | AT 613      | Statistical Methods for Data Science                 |    |
| ST    | AT 612      | Statistical Inference for Data<br>Science            |    |
| ST    | AT 611      | Statistical Models for Data Science                  |    |
| CC    | DMP SCI 900 | Advanced Seminar in Computer<br>Science <sup>1</sup> |    |
| CC    | OMP SCI 799 | Master's Research <sup>1</sup>                       |    |

<sup>1</sup> COMP SCI 799 Master's Research, COMP SCI 790 Master's Thesis, COMP SCI 702 Graduate Cooperative Education, and COMP SCI 900 Advanced Seminar in Computer Science can be taken for a combined

total of at most three elective credits.

• Courses used as an elective cannot also be used to fulfill data engineering fundamentals requirements or breadth requirements for machine learning, algorithms, systems, and humans and data.

Students in this program may not take courses outside the prescribed curriculum without faculty advisor and program director approval. Students in this program cannot enroll concurrently in other undergraduate or graduate degree programs.