DATA SCIENCE, MS DATA ENGINEERING SPECIALIZATION

After analysts and modelers have built and tested models, data engineers implement models to scale within an information infrastructure, creating systems and workflows to organize and manage large quantities of data. This means understanding computer systems (including software, hardware, data collection, and data processes) and solving problems related to data collection, security, and organization. This specialization trains data scientists to utilize system-wide problem-solving skills, choose hardware systems, and build software systems for implementing models made by data analysts to scale in productions systems.

Curriculum

Core Courses (8 units)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MSDS 400-DL</td>
<td>Math For Data Scientists</td>
</tr>
<tr>
<td>MSDS 401-DL</td>
<td>Applied Statistics with R</td>
</tr>
<tr>
<td>MSDS 402-DL</td>
<td>Introduction to Data Science</td>
</tr>
<tr>
<td>or MSDS 403-DL</td>
<td>Data Science in Practice</td>
</tr>
<tr>
<td>MSDS 420-DL</td>
<td>Database Systems and Data Preparation</td>
</tr>
<tr>
<td>MSDS 422-DL</td>
<td>Practical Machine Learning</td>
</tr>
<tr>
<td>MSDS 460-DL</td>
<td>Decision Analytics</td>
</tr>
<tr>
<td>MSDS 475-DL</td>
<td>Project Management</td>
</tr>
<tr>
<td>or MSDS 480-DL</td>
<td>Business Leadership and Communications</td>
</tr>
<tr>
<td>or MSDS 485-DL</td>
<td>Data Governance, Ethics, and Law</td>
</tr>
<tr>
<td>MSDS 498-DL</td>
<td>Capstone Class</td>
</tr>
<tr>
<td>or MSDS 590-DL</td>
<td>Thesis Research</td>
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</tbody>
</table>

1 Which course should students take?

- Students without a background in data science should select MSDS 402-DL Introduction to Data Science.
- Students with a background in data science should select MSDS 403-DL Data Science in Practice. Students who have at least two years’ experience in the field and have or had a title, such as data scientist, data analyst, statistician, data engineer, business analyst, etc. should select this course.

Specialization Courses (4 units)

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<tr>
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</thead>
<tbody>
<tr>
<td>MSDS 400-DL</td>
<td>Supervised Learning Methods</td>
</tr>
<tr>
<td>MSDS 411-DL</td>
<td>Unsupervised Learning Methods</td>
</tr>
<tr>
<td>MSDS 413-DL</td>
<td>Times Series Analysis and Forecasting</td>
</tr>
<tr>
<td>MSDS 430-DL</td>
<td>Python for Data Analysis</td>
</tr>
<tr>
<td>MSDS 436-DL</td>
<td>Analytics Systems Engineering</td>
</tr>
<tr>
<td>MSDS 440-DL</td>
<td>Real-Time Interactive Processing and Analytics</td>
</tr>
<tr>
<td>MSDS 442-DL</td>
<td>Real-Time Stream Processing and Analytics</td>
</tr>
<tr>
<td>MSDS 450-DL</td>
<td>Marketing Analytics</td>
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<tr>
<td>MSDS 451-DL</td>
<td>Financial Machine Learning</td>
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<tr>
<td>MSDS 452-DL</td>
<td>Web and Network Data Science</td>
</tr>
<tr>
<td>MSDS 453-DL</td>
<td>Natural Language Processing</td>
</tr>
<tr>
<td>MSDS 454-DL</td>
<td>Applied Probability and Simulation Modeling</td>
</tr>
</tbody>
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About the Final Project

As their final course in the program, students take either a master’s thesis project in an independent study format or a classroom final project class in which students integrate the knowledge they have gained in the core curriculum in a team project approved by the instructor. In both cases, students are guided by faculty in exploring the body of knowledge of data science. The master’s thesis or capstone class project count as one unit of credit.

Course       | Title                                      |
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