Data Science Certificate

Program Director: Michael Zimmer, Ph.D.
Data Science website (https://www.marquette.edu/grad/programs-data-science-certificate.php)

Degree Offered
Certificate

Program Description
The curriculum is designed to connect data analytics and data science skills and knowledge with the needs evident in a host of fields. This certificate program seeks to meet a significant need for data analytics experts, targeting a human-centered approach. Those completing this certificate program will be able to identify and articulate problems, issues and decisions that can be informed by data analytics approaches and the ethical and social issues surrounding them; design and implement advanced strategies for analyzing big data, and create and present actionable information.

Prerequisite for Admission
Applicants should have:

- An earned baccalaureate degree in any field with a GPA of at least 3.000.
- Basic computational thinking competency as demonstrated by completion of an introductory course (e.g., COSC 1010 Introduction to Software Development or equivalent). Alternatively, proof of successful completion of a recommended introductory online Python programming course as recommended by the program director.
- A foundational statistics course (e.g., PSYC 2001 Psychological Measurements and Statistics, SOCI 2060 Social Statistics or equivalent) with familiarity in programs such as R, MATLAB, SAS, Stata, etc. Alternatively, proof of successful completion of a recommended introductory online foundational statistics course as recommended by the program director.

Application Deadlines
Applications are reviewed on a rolling basis, and admitted students may begin their program in fall or spring.

Application Requirements
Applicants must submit, directly to the Graduate School:

1. A completed application form and fee online (http://marquette.edu/grad/future_apply.shtml/).
2. Copies of all college/university transcripts except Marquette.¹
3. (For international applicants only) a TOEFL score or other acceptable proof of English proficiency.

Optional application requirements: a statement of purpose and three letters of recommendation.

¹ Upon admission, final official transcripts from all previously attended colleges/universities, with certified English translations if original language is not English, must be submitted to the Graduate School within the first five weeks of the term of admission or a hold preventing registration for future terms is placed on the student record.

Data Science Certificate Requirements
All students admitted to the data science certificate program are required to complete at least 15 credit hours of course work.

This ethically-centered graduate certificate is in the emerging interdisciplinary field of data science, which seeks to extract and quantify knowledge from large and/or heterogeneous data sets. The certificate prepares students to integrate advanced technology with modern statistical and mathematical practices and use data in action to directly benefit society. Students learn how to turn data into knowledge, thereby guiding problem-solving and decision-making.

A student must complete a minimum of 15 credits of course work from the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COSC 5500</td>
<td>Visual Analytics</td>
<td>3</td>
</tr>
<tr>
<td>COSC 5820</td>
<td>Ethical and Social Implications of Data</td>
<td>3</td>
</tr>
<tr>
<td>COSC 6510</td>
<td>Business Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>COSC 6520</td>
<td>Business Analytics ¹</td>
<td>3</td>
</tr>
<tr>
<td>or COSC 6540</td>
<td>Data Analytics</td>
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<tr>
<td>COSC 6570</td>
<td>Data at Scale ²</td>
<td>3</td>
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</table>
Data Science (DTSC) or COSC 6060 Parallel and Distributed Systems or COSC 6380 Advanced Database Systems

Total Credit Hours 15

1. COSC 6540 recommended for students with a programming background
2. COSC 6060 or COSC 6380 recommended for students with a computer science background