MASTER OF SCIENCE IN THE FIELD OF DATA ANALYTICS

Administered jointly through the Department of Computer Science (http://cs.seas.gwu.edu) and the Department of Engineering Management & Systems Engineering (http://emse.seas.gwu.edu), the program seeks to address the growing demand for professionals skilled in big data and data analytics in government, industry and research organizations. Through courses led by top faculty members at SEAS and the GW School of Business, this program covers topics in computer science, business analytics, and systems engineering while focusing on the foundations of analytics from a technical, engineering perspective.

This program is ideal for those seeking to learn in a small, tight-knit cohort about the engineering foundations that propel the fields of data science and analytics; pursue or enhance careers as data analysts or data scientists; lead interdisciplinary teams; or apply data science and analytics techniques in the decision-making process of a wide range of organizations.

Prerequisites
In addition to the entrance requirements, students are expected to be adequately prepared in calculus and probability/statistics concepts. The MS program requires students to have completed MATH 1231 and MATH 1232 (Calculus I and Calculus II), and APSC 3115 (Engineering Analysis III), or their equivalents. Background in linear algebra is strongly recommended but not required.

Educational Planner
In consultation with an academic advisor, each student must develop an Educational Planner through DegreeMAP that governs the student's degree requirements. The Educational Planner should be established soon after matriculation and must be completed before the end of the student's first semester. The Educational Planner must be approved by the advisor.

REQUIREMENTS

Credit Requirements
The program of study consists of graduate-level courses totaling 33 credits. Thesis is not a requirement for the completion of the program. The details of the required courses and electives are shown below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSCI 6362</td>
<td>Probability for Computer Science</td>
<td></td>
</tr>
<tr>
<td>or EMSE 6765</td>
<td>Data Analysis for Engineers and Scientists</td>
<td></td>
</tr>
<tr>
<td>CSCI 6441</td>
<td>Database Management Systems</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 6444</td>
<td>Introduction to Big Data and Analytics</td>
<td></td>
</tr>
<tr>
<td>EMSE 6574</td>
<td>Programming for Analytics</td>
<td></td>
</tr>
<tr>
<td>SEAS 6401</td>
<td>Data Analytics Capstone I</td>
<td></td>
</tr>
<tr>
<td>SEAS 6402</td>
<td>Data Analytics Capstone II</td>
<td></td>
</tr>
</tbody>
</table>

Electives
Students take six elective courses, at least four of which must be in either the computer science track or in the engineering management and systems engineering track, effectively constituting a concentration in one of the two tracks. Up to two courses may be taken outside of SEAS; courses in the business analytics program are recommended.

Computer science track electives
- CSCI 6212 Design and Analysis of Algorithms
- CSCI 6312 Graph Theory and Applications
- CSCI 6341 Continuous Algorithms
- CSCI 6342 Computational Linear Algebra and Applications
- CSCI 6351 Data Compression
- CSCI 6364 Machine Learning
- CSCI 6365 Advanced Machine Learning
- CSCI 6421 Distributed and Cluster Computing
- CSCI 6442 Database Systems II
- CSCI 6443 Data Mining
- CSCI 6451 Information Retrieval Systems
- CSCI 6515 Natural Language Understanding
- CSCI 6527 Introduction to Computer Vision

Engineering management and systems engineering track electives
- EMSE 6020 Decision Making with Uncertainty
- EMSE 6510 Decision Support Systems and Models
- EMSE 6575 Applied Machine Learning for Analytics
- EMSE 6579 Applied Data Mining in Engineering Management
- EMSE 6740 Systems Thinking and Policy Modeling I
- EMSE 6760 Discrete Systems Simulation
Graduation and Scholarship Requirements
Students are responsible for knowing the university’s minimum GPA requirement for graduation and scholarships. Please visit the Graduation and Scholarship Requirements (http://bulletin.gwu.edu/engineering-applied-science/#graduation_requirements_ms) section on this site to read the requirements.

Students should contact the department for additional information and requirements.

Program Restrictions
Normally, only 6000 level courses (or higher) may be counted toward the requirements for the graduate degree.