Data Science and Analysis BS, Mathematics Emphasis

General Education Requirements
Students must satisfy the university general education requirements. Many of the courses for the degree may be used to fulfill math proficiency, information literacy, social science, and math and life/natural sciences requirements. The program recommends students take ENGL 3130, Technical Writing or ENGL 3120, Business Writing, to satisfy the Junior-Level Writing requirement. Emphasis areas may require one of these courses. There is no foreign language requirement for the degree.

Satisfactory/Unsatisfactory Option
Courses required for the major may not be taken on a satisfactory/unsatisfactory basis.

Degree Requirements
The BS in Data Science and Analysis consists of a set of core courses along with an emphasis area.

Core Course
MATH 1800  Analytic Geometry and Calculus I  3-5
or MATH 1100  Basic Calculus

Statistics Course
The introduction to Statistics course should align with the student's discipline emphasis area.

Choose one of the following:
SOC/ANTHRO 3220  Quantitative Data Analysis in Social Science Research
BIOL 4122  Biostatistics
ECON 3100  Economic Data and Statistics
CRIMIN 2220  Statistical Analysis in Criminology and Criminal Justice
MATH 1320  Introduction to Probability and Statistics
PSYCH 2201  Psychological Statistics
POL SCI 3000  Political Analysis
SCMA 3300  Business Analytics and Statistics

Additional Required Courses
MATH 4005  Exploratory Data Analysis with R  3
CMP SCI 1250  Introduction to Computing  3
CMP SCI 4200  Python for Scientific Computing and Data Science  3
CMP SCI 4342  Introduction to Data Mining  3

Total Hours  18-20

Emphasis Area Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MATH 1900</td>
<td>Analytic Geometry and Calculus II</td>
<td>5</td>
</tr>
<tr>
<td>MATH 2000</td>
<td>Analytic Geometry and Calculus III</td>
<td>5</td>
</tr>
<tr>
<td>MATH 2450</td>
<td>Elementary Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 4200</td>
<td>Mathematical Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>MATH 4210</td>
<td>Mathematical Statistics II</td>
<td>3</td>
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Choose two of the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MATH 4090</td>
<td>Introduction to High-dimensional Data Analysis</td>
</tr>
<tr>
<td>MATH 4220</td>
<td>Bayesian Statistical Methods</td>
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<tr>
<td>MATH 4225</td>
<td>Introduction to Statistical Computing</td>
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<tr>
<td>MATH 4250</td>
<td>Introduction to Statistical Methods in Learning and Modeling</td>
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<tr>
<td>MATH 4260</td>
<td>Introduction to Stochastic Processes</td>
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Total Hours  25

Learning Outcomes
Upon completion of the program, graduates will be able to:

- Apply knowledge of statistical data collection, analysis and quantitative modeling techniques
- Demonstrate proficiency in industry-standard programming languages that support data acquisition, retrieval and analysis
- Select, apply and build data-based models and visualizations to devise solutions to data science problems
- Effectively communicate technical results and recommendations in various formats to appropriate audiences
- Reformulate problems or question in relevant mathematical terms
- Solve multivariable problems which involve algebra or calculus
- Apply statistical concepts and data science methods to analyze real-world problems using appropriate mathematical processes and techniques

Students interested in the Computer Science emphasis area, the Mathematics Emphasis Area, or in taking additional mathematics courses, should take MATH 1800.