

DATA ANALYTICS, CERTIFICATE

This certificate is for degree-seeking students as well as individuals working in data-intensive sectors who need to better understand quantitative data analytics, including how to implement powerful machine-learning techniques. Students earning this certificate will acquire a deeper, more sophisticated understanding of and the ability to implement powerful current tools and techniques for data analysis.

Upon completion of the data analytics certificate program, students will demonstrate

- facility with important data-friendly programming languages such as Python
- knowledge of significant algorithms that relate to data analytics, including how to analyze algorithms for effectiveness; and
- knowledge and ability to implement a variety of modern data analytics techniques and tools, including from machine learning.

As the certificate courses are electives within the mathematics major, additional learning outcomes will include the following:

- Students will be able to formulate and solve problems using mathematical tools, while working alone or in groups on non-routine and open-ended problems involving applications to other fields, and problems involving real-world data.
- Students will demonstrate the ability to learn independently, locate and use appropriate sources of technical material, and make use of modern computational tools.
- Students will produce convincing, precise verbal and written communications of technical material.

Specific Program Requirements

| Course | Title | Credits |
|-----------------------|-------------------------------------|-----------|
| MATH 242 | Introduction to Computation | 4 |
| MATH 345 | Algorithms & Data Structures | 4 |
| MATH 442 | Machine Learning for Data Analytics | 3 |
| Elective ¹ | | 2 |
| Total Credits | | 13 |

¹ Contact the department chair for possible options (e.g. a special topics offered by the Department of Mathematics and Physics such as R-based analytics or quantum computing, or a bioinformatics class taught within the Department of Biology, or possibly some offerings from the Department of Computer Information Systems would be approved).