

# Ph.D. in Data Science

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<https://www.saintpeters.edu/academics/graduate-programs/phd-data-science/>

The Ph.D. in Data Science curriculum is 70 credits total, with 54 credits of required courses along with 16 credits of dissertation research. Students will register for 4 distinct research course sections, during which students will complete their doctoral dissertation with a principal adviser and faculty committee members. The goal of the program is to provide Ph.D. students the research training needed to advance the field of data science and to prepare them for rewarding careers in academia and industry.

To be awarded the Doctoral Program in Data Science, students must complete the following within 10 years of first enrolling:

- Complete 54 credit hours of coursework plus 16 credits of dissertation research, while maintaining a cumulative grade point average of 3.0 (out of 4.0) each semester.
- Pass a Ph.D. qualifying exam after their fourth trimester.
- Pass a Ph.D. proposal defense (eligible only after passing Ph.D. qualifying exam).
- Pass a final defense of the dissertation after the completion of coursework and research.
- Complete all the steps for approval of their Ph.D. dissertation.

Saint Peter's M.S. program alumni are eligible to transfer in up to a maximum of 18 credits towards the program (for outsiders up to 12 credits).

## **Business/Management Courses – 9 Credits**

1. DS – 650 Data Law and Ethics and Business Intelligence
2. DS – 800 Forecasting Methods for Business Decisions
3. GE – 826 Analysis and Interpretation of Assessment Data

## **Technology / Data Science Courses – 33 Credits**

1. DS – 510 Introduction to Data Science
2. DS – 520 Data Analysis & Decision Model
3. DS – 542 Introduction to Python
4. DS – 600 Data Mining
5. DS – 630 Machine Learning
6. DS – 631 Deep Learning Algorithms
7. DS – 801 Advanced Data Structures & Algorithms
8. DS – 802 Natural Language Processing
9. DS – 803 Optimization and Computational Linear Algebra
10. DS – 804 Advanced Optimization
11. DS – 805 Research Seminar in Forecasting **or**
12. DS – 806 Research Seminar in Unstructured Data Analysis

## **Education Courses – 12 Credits**

1. GE – 801 Curriculum Development & Instructions
2. GE – 809 Research Design and Methods
3. GE – 829 Using Technology to Improve Curriculum Design
4. MS – 523 Behavioral Research Methods and Design

## **Dissertation Research — 16 Credits (4 credits each)**

1. DS – 871 Dissertation Seminar I
2. DS – 872 Dissertation Seminar II
3. DS – 873 Dissertation Seminar III
4. DS – 874 Dissertation Seminar IV

### **Pass a Ph.D. Qualifying Examination**

The Ph.D. qualifying exam is designed to determine whether the candidate displays the requisite data science knowledge in the basic areas of data science and machine learning. The comprehensive exam consists of material from the following courses.

1. DS-510 – Introduction to Data Science
2. DS-520 – Data Analysis & Decision Model
3. DS-542 – Python in Data Science
4. DS-600 – Data Mining

To qualify for the Ph.D. qualifying examination, students must receive an B or above as their final grade for each of the courses above. Students are expected to complete this requirement by the end of their fourth trimester. Students who do not pass the Ph.D. qualifying examination requirement will be placed on academic probation and must complete the requirement by the end of their sixth trimester.

### **Pass a Ph.D. Proposal Defense**

Scheduled individually for each student, the proposal defense explores research in an area of interest that might lead to an eventual dissertation topic. Students should approach faculty about scheduling an exam at a convenient time before the end of their fifth trimester.

### **Ph.D. Dissertation Defense**

The defense itself of the dissertation will involve questions and comments from the selected committee based on a thorough scrutiny of the dissertation. Candidates should be prepared to make a case for the importance of their research, for its place in current scholarship, and for the possible future of the project, with an eye both to job placement and opportunities for peer-reviewed publication beyond the dissertation stage. All successfully defended dissertations will be published in ProQuest national repository (<http://library.saintpeters.edu/login?url=http://search.proquest.com/pqdtglobal>) and the Saint Peter's University Document Repository (<https://blacklight.saintpeters.edu/docshome/>).

### **Overlapping Terms**

The Ph.D. program contains both semester and trimester-based courses. Students are permitted to enroll in either semester or trimester courses for the entire academic year. Students are not permitted to enroll in semester and trimester courses at the same time, as they overlap. Students are recommended to enroll in semester courses for the first academic year and then switch to trimester courses thereafter.