DATA SCIENCES, B.S. (ABINGTON)

Begin Campus: Any Penn State Campus

End Campus: Abington

Degree Requirements

For the Bachelor of Science degree in Data Sciences, a minimum of 123 credits is required:

Requirement	Credits
General Education	45
Electives	3-12
Requirements for the Major	72-81

6 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 6 credits of GQ courses.

Requirements for the Major

To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/).

Common Requirements for the Major (All Options)

Code	Title	Credits
Prescribed Courses		
Prescribed Courses: Require a grade of C or better		
DS 220	Data Management for Data Sciences	3
DS 340W	Applied Data Sciences	3
DS 435	Ethical Issues in Data Science Practice	3
MATH 140	Calculus With Analytic Geometry I	4
MATH 141	Calculus with Analytic Geometry II	4
MATH 220	Matrices	2
STAT 184	Introduction to R	2
STAT 380	Data Science Through Statistical Reasoning and Computation	3
Additional Courses		
Additional Courses: Require a grade of C or better		
1 credit of First-Year Seminar		1
CMPSC 121	Introduction to Programming Techniques	3
or CMPSC 131	Programming and Computation I: Fundamentals	
CMPSC 122	Intermediate Programming	3
or CMPSC 132	Programming and Computation II: Data Structures	
DS 440	Data Sciences Capstone Course	3
or DS 440W	Data Science Capstone	
Requirements for the Option		
Select an option		38-47

Requirements for the Option

Applied Data Sciences (DATSC_BS, DTSAB_BS): 47 credits
Only Available through the College of Information Sciences and Technology and Penn State Abington

Code	Title	Credits
Prescribed Courses		
Prescribed Courses: Require a grade of C or better		
DS 200	Introduction to Data Sciences	4
DS 300	Privacy and Security for Data Sciences	3
DS 305	Algorithmic Methods and Tools	3
DS 310	Machine Learning for Data Analytics	3
DS 320	Data Integration	3
DS 330	Visual Analytics for Data Sciences	3
DS/CMPSC 410	Programming Models for Big Data	3
IST 495	Internship	1
Additional Courses		
Select 6 credits from any combination:		6
DS 402	Emerging Trends in the Data Sciences	
DS 420	Network Analytics	
DS/CMPSC 442	Artificial Intelligence	
DS 494	Research Project	
IST 441	Information Retrieval and Organization	
IST 442	Information Technology in an International Context	
SODA 308	Research Design for Social Data Analytics	
Additional Courses: Require a grade of C or better		
Select 3 credits from the following:		3
CMPSC 360	Discrete Mathematics for Computer Science	
IST 230	Language, Logic, and Discrete Mathematics	
MATH 311W	Concepts of Discrete Mathematics	
Select 3 credits from the following:		3
STAT/MATH 318	Elementary Probability	
STAT/MATH 414	Introduction to Probability Theory	
STAT/MATH 418	Introduction to Probability and Stochastic Processes for Engineering	
Supporting Courses and Related Areas [1]		
Select 12 credits from the lists of Application Focus courses; 6 credits must at at the 300- or 400-levels.		12

[1]   Students may apply up to 3 credits of ROTC as option Application Focus list credits and 3 credits of ROTC as GHW credits.

LIST OF APPLIED DATA SCIENCES COURSES (https://bulletins.psu.edu/undergraduate/colleges/information-sciences-technology/data-sciences-bs/#suggestedacademicplantext)

Computational Data Sciences (DTSCE_BS): 47 credits
Only Available through the College of Engineering

Code	Title	Credits
Prescribed Courses		
Prescribed Courses: Require a grade of C or better		
CMPSC 221	Object Oriented Programming with Web-Based Applications	3
CMPSC 360	Discrete Mathematics for Computer Science	3

CMPSC 442	Artificial Intelligence	3
CMPSC 448	Machine Learning and Algorithmic AI	3
CMPSC 461	Programming Language Concepts	3
CMPSC 465	Data Structures and Algorithms	3
DS/CMPSC 410	Programming Models for Big Data	3
MATH 230	Calculus and Vector Analysis	4
STAT/MATH 414	Introduction to Probability Theory	3
STAT/MATH 415	Introduction to Mathematical Statistics	3
Additional Courses		
Additional Courses: Require a grade of C or better		
DS 200	Introduction to Data Sciences	4
or STAT 200	Elementary Statistics	
Supporting Courses and Related Areas [1]		
Select 6 credits from Computational Option List A in Appendix C		6
Select 6 credits from Computational Option List B in Appendix C		6

[1] Students may apply up to 3 credits of ROTC as option list credits and 3 credits of ROTC as GHW credits.

LIST OF COMPUTATIONAL DATA SCIENCES COURSES (https://www.eecs.psu.edu/students/undergraduate/Data-Sciences.aspx)

Statistical Modeling Data Sciences (DTSCS_BS, DTSAB_BS): 38 credits Only Available through the Eberly College of Science and Penn State Abington

Code	Title	Credits
Prescribed Courses		
Prescribed Courses: Require a grade of C or better		
MATH 230	Calculus and Vector Analysis	4
STAT/MATH 414	Introduction to Probability Theory	3
STAT/MATH 415	Introduction to Mathematical Statistics	3
STAT 440	Computational Statistics	3
STAT 462	Applied Regression Analysis	3
Additional Courses		
Additional Courses: Require a grade of C or better		
DS 200	Introduction to Data Sciences	4
or STAT 200	Elementary Statistics	
DS 310	Machine Learning for Data Analytics	3
or CMPSC 448	Machine Learning and Algorithmic AI	
MATH 311W	Concepts of Discrete Mathematics	3
or CMPSC 360	Discrete Mathematics for Computer Science	
Supporting Courses and Related Areas [1]		
Select 6 credits from Statistical Modeling Option List A courses, see Appendix D		6
Select 6 credits from Statistical Modeling Option List B courses, see Appendix D		6

[1] Students may apply up to 3 credits of ROTC as option list credits and 3 credits of ROTC as GHW credits.

LIST OF STATISTICAL MODELING DATA SCIENCES COURSES (https://bulletins.psu.edu/undergraduate/colleges/eberly-science/data-sciences-bs/#suggestedacademicplantext)

General Education

Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (https://bulletins.psu.edu/undergraduate/general-education/baccalaureate-degree-general-education-program/) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

Foundations (grade of C or better is required and Inter-Domain courses do not meet this requirement.)
- **Quantification (GQ):** 6 credits
- **Writing and Speaking (GWS):** 9 credits

Breadth in the Knowledge Domains (Inter-Domain courses do not meet this requirement.)
- **Arts (GA):** 3 credits
- **Health and Wellness (GHW):** 3 credits
- **Humanities (GH):** 3 credits
- **Social and Behavioral Sciences (GS):** 3 credits
- **Natural Sciences (GN):** 3 credits

Integrative Studies
- **Inter-Domain Courses (Inter-Domain):** 6 credits

Exploration
- **GN,** may be completed with Inter-Domain courses: 3 credits
- **GA, GH, GN, GS, Inter-Domain courses.** This may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher**:** 6 credits

University Degree Requirements

First Year Engagement
All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

Cultures Requirement
6 credits are required and may satisfy other requirements

- United States Cultures: 3 credits
- International Cultures: 3 credits

Writing Across the Curriculum

3 credits required from the college of graduation and likely prescribed as part of major requirements.

Total Minimum Credits

A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

Quality of Work

Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

Limitations on Source and Time for Credit Acquisition

The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (https://senate.psu.edu/students/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/)). For more information, check the Suggested Academic Plan for your intended program.