PennState
College of Information
Sciences and Technology

College of Information Sciences and Technology
Office of Undergraduate Academic Services
Current Students: advising@ist.psu.edu
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Bachelor of Science in
Data Sciences

The Data Sciences Bachelor of Science program is part of an intercollege initiative to meet the need for professionals who can make sense of big data. The program provides students with the technical fundamentals of data sciences, with a focus on developing the knowledge and skills needed to manage and analyze large-scale, unstructured data to address an expanding range of problems in industry, government, and academia. As a result, Data Sciences graduates will possess the core skills and problem-solving approaches to compete for leading-edge analytics positions across many different industry sectors.

Student can select from one of three options within the Data Sciences major:
- Applied Data Sciences (offered by the College of Information Sciences and Technology)
- Computational Data Sciences (offered by the College of Engineering)
- Statistical Modeling Data Sciences (offered by the Eberly College of Science)

The most successful students in this major are:
Analytical • Articulate • Curious • Detailed-oriented • Interpretive • Problem solvers • Quick learners • Thorough

Applied Data Sciences

Offered by the College of Information Sciences and Technology

Study the principles, methods, and tools for management, integration, analysis, visualization, and predictive modeling of massive, complex data. Students will learn how to develop, apply, and validate machine learning solutions to extract actionable knowledge from large data sets. Whether it's predicting disease patterns to save more lives, analyzing financial markets, or optimizing marketing strategies based on customer behavior, students will unlock big data to solve an infinite range of problems in industry, government, and academia.

For more information about the Computational Data Sciences option offered by the College of Engineering and the Statistical Modeling Data Sciences option offered by the Eberly College of Science, visit datasciences.psu.edu.

All Data Sciences options require 50 credits of prescribed coursework, with 41 of these credits earned through common required courses and the remaining nine credits selected by the student from a defined list. These courses include two semesters of programming and calculus, concepts and skills relating to statistics and databases, and a capstone course (DS 440). The Applied Data Sciences option also requires the student to earn 40 additional credits through 14 courses that will expand skills in applying data sciences techniques and concepts to real-world problems.

When selections are allowed, students should plan a coherent set of choices in consultation with his or her adviser.

ADDITIONAL PRESCRIBED COURSES:
In addition to the requirements above, students pursuing an degree in the Applied Data Sciences option must complete 22 credits in the following courses:

- **IST 110 – Information, People and Technology**
- **IST 230 – Language, Logic, and Discrete Mathematics**
- **DS 200 – Introduction to Data Sciences**
- **DS 310 – Machine Learning for Data Analytics**
- **DS 320 – Integration and Fusion**
- **DS 330 – Visual Analytics for Data Sciences**
- **DS 410 – Data Analytics at Scale**
- **IST 495 – Approved Internship**

OTHER SELECTED COURSES:
Students in the Applied Data Sciences option must take 18 additional credits, which can be selected from a list of available courses such as those below:

- **SODA 308 – Research Design for Social Data Analytics**
  Study and use research design tools to analyze big data. Develop innovative research designs to improve statistical analyses and learn how to present findings to non-technical audiences.

- **STAT 380 – Data Science through Statistical Reasoning and Computation**
  Take a holistic view of statistical analysis through case studies to obtain, clean, and interpret data. Use the R programming language and novel computing techniques to build upon introductory statistical concepts.

- **STAT 416 – Stochastic Modeling**
  Learn about data distribution models, probability generating functions, transforms, convolutions, Markov chains, equilibrium distributions, Poisson process, birth and death processes, and estimation.

- **DS 402 – Emerging Trends in the Data Sciences**
  Explore the rapidly evolving field of Data Sciences and how it's affected by innovation in a variety of technical fields. Learn the analytic framework to assess innovation, its potential for widespread adoption, and its implications.

Our graduates are in high demand.

Graduates from the College of IST have technical expertise and business savvy, giving them the versatility employers want.

Their unique skills add value to every field as the need for professionals who can bring IT knowledge to businesses and organizations grows.

Pursue meaningful and diverse careers.

With two career fairs for students in our majors and more than 300 companies actively recruiting them, graduates are prepared for careers like:

- Big Data Engineer
- Business Intelligence Analyst
- Data Scientist
- Data Visualizer
- Data Warehousing Analytics Consultant
- Quantitative Analyst
- Statistical Analyst

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