PURDUE UNIVERSITY

Data Science (Mathematics)

College of Science

2024-2025

Program Progression Guides

Disclaimer: The 2024-2025 Purdue West Lafayette catalog is considered the source for academic and programmatic requirements for students entering programs during the Fall 2024, Spring 2025, and Summer 2025 semesters. The Program Progression Guide assists students in the development of an individualized 8-semester plan. Students are encouraged to use this guide, MyPurduePlan* (online degree auditing tool) and the Student Educational Planner (SEP) as they work with their academic advisor towards the completion of their degree requirements.
Notification: Each student is ultimately responsible for knowing, monitoring and completing all degree requirements.

An undergraduate degree in the College of Science requires completion of the following degree requirements.

<table>
<tr><td colspan="3">University Degree Requirements</td></tr>
<tr><td>Minimum 2.0 Cumulative GPA</td><td>Minimum 120 Credits that fulfill degree requirements</td><td>32 Residency Credits (30000 and above) at a Purdue University campus</td></tr>
<tr><td colspan="3">University Core Curriculum**</td></tr>
<tr><td colspan="2">Human Cultures: Behavioral/Social Science
Human Cultures: Humanities
Information Literacy
Oral Communication
University Core Curriculum
Course Listing</td><td>Quantitative Reasoning
Science
Science, Technology & Society Selective
Written Communication</td></tr>
<tr><td colspan="3">Civic Literacy Proficiency - https://www.purdue.edu/provost/about/provostInitiatives/civics/</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td colspan="3">Required Major Program Courses</td></tr>
<tr><td colspan="3">Departmental specific requirements: For this degree, all major required courses, all major electives (selectives), and their pre-requisites, regardless of department, must be completed with a grade of C or better.</td></tr>
<tr><td colspan="3">College of Science Core Curriculum</td></tr>
<tr><td>Written Communication – 3-4 credits
Technical Writing and Presentation – 3-6 credits
Teaming & Collaboration (NC)
General Education - 9 credits</td><td>Foreign Language & Culture – 0-9 credits
Great Issues - 3 credits
Laboratory Science – 6-8 credits
Science, Technology & Society - 3 credits</td><td>Mathematics - 6-10 credits
Statistics - 3 credits
Computing – 3-4 credits</td></tr>
<tr><td colspan="3">Degree Electives</td></tr>
<tr><td colspan="3">Any Purdue or transfer course approved to meet degree requirements in accordance with individual departmental policies. The College of Science has identified courses that are below the disciplinary level of each program and major area of study. While similar, Not Recommended course lists vary between departments.</td></tr>
</table>

* This audit is not your academic transcript and it is not official notification of completion of degree or certificate requirements.

** University Core Curriculum Outcomes may be met through completion of the College of Science Core curriculum. Students should consult with their academic advisors and MyPurdue Plan for course selections.

2024-2025 Data Science - MATH Degree Progression Guide

The Mathematics Department has suggested the following degree progression guide for the Data Science - MATH Degree. Students will work with their academic advisors to determine their best path to degree completion. Course pre-requisites are specific to this degree plan.

Credit	Fall 1st Year	Prerequisite	Credit	Spring 1st Year	Prerequisite
4	CS 18000[CC] ***	Co-req CALC I	3	CS 18200 ***	CS 18000 & CALC I
1	CS 19300 *	Co-req CS 18000	1	CS 38003 ***	CS 18000
4-5	MA 16100[CC] or 16500[CC] **	ALEKS 85+	4-5	MA 16200 or MA 16600 **	CALC I
1	MA 10800 (Free Elective)		3-4	Science Core Option	
3-4	Science Core Option		3	Science Core Option	
3	Free Elective		1-2	Free Elective	
16-18			**15-18**		

Credit	Fall 2nd Year	Prerequisite	Credit	Spring 2nd Year	Prerequisite
3	CS/or STAT 24200 ***	CS 18200, CS 38003, & Co-req STAT 35500	3	CS 25300 ***	CS 18200 & CS/STAT 24200
3	STAT 35500 ***	CALC II	3	MA 35100 ***	CALC III
4-5	MA 26100 or MA 27101 ***	CALC II	3	MA/STAT 41600 ***	CALC III
3-4	Science Core Option		3	Ethics Selective ***	Varies
1-3	Free Elective		3-4	Science Core Option	
			1-2	Free Elective	
14-18			**16-18**		

Credit	Fall 3rd Year	Prerequisite	Credit	Spring 3rd Year	Prerequisite
3	CS 37300 or MA 37400 *** (*CS37300 must be taken if planning to take CS44000 and CS44100 Data Science Capstone*)	Varies	3	MA 37500 ***	MA 35100
3	STAT 41700 ***	STAT 35500 & STAT 41600	3	CS 348000 or MA 34900 ***	Varies
3	MA 34100 or MA 44000 ***	Varies	3-4	Science Core Option	
3	Science Core Option (sug. COM 21700)		3-4	Science Core Option	
3-4	Science Core Option		3	Free Elective	
15-16			**15-17**		

Credit	Fall 4th Year	Prerequisite	Credit	Spring 4th Year	Prerequisite
3	CS Selective ***	Varies	3	CS 44100 Data Science Capstone (Recommended Option) /or Capstone Experience ***	Varies (*CS37300 required for CS44000 Data Science Capstone*)
3	MA 42100 ***	MA 35100	3-4	Science Core Option	
3-4	Science Core Option		3-4	Science Core Option	
3	MA 43200 ***	MA 35100 & STAT/MA 41600	3	MA Selective ***	Varies
3	Free Elective		3	Free Elective	
1	Free Elective		1	Free Elective	
16-17			**13-18**		

Science Core Curriculum Options (one course needed for each requirement unless otherwise noted)	
Options recommended for first- and second-year students	**Options recommended for third- and fourth-year students**
Written Communication[UC]	Technical Writing and Presentation[UC] (COM 217 recommended)
Computing (CS 18000)	General Education[UC] (3 courses needed)
Foreign Language and Culture[UC] (3 courses needed)	Lab Science[UC] (2 courses needed)
Science, Technology & Society[UC]	Great Issues

[UC] Select courses may also satisfy a University Core Curriculum requirement; see the University Core Requirement course list for approved courses. Students must have 32 credits at the 30000 level or above taken at Purdue.

**For this degree, all major required courses, all major electives (selectives), and their pre-requisites, regardless of department, must be completed with a grade of C or better.

***For this degree, all major required courses, all major electives (selectives), and their pre-requisites, regardless of department, must be completed with a grade of C or better.

Equivalent 10000 and 20000-level Computer Science (CS) transfer credit courses (including credit from regional campuses) may be used to meet degree requirements if those courses were taken prior to admission to the Purdue West Lafayette Data Science, B.S. Mathematics program. Equivalent 10000 and 20000-level Mathematics (MA) transfer credit and MA 35100 transfer credit with a "B" or better (including credit from regional campuses) may be used to meet degree requirements if those courses were taken prior to admission to the Purdue West Lafayette Data Science, B.S. Mathematics program. CS and MA transfer credit at the 30000-40000-level may not be used to meet degree requirements. As exception to this policy is the application of pre-approved Study Abroad coursework.

2024-2025 Data Science Major Courses

Credits	Course Number	Course Description
4	CS 18000	Problem Solving and object-Oriented Programming
3	CS 18200	Foundations of Computer Science
1	CS 38003	Python Programming
3	CS/or STAT 24200	Introduction to Data Science
3	STAT 35500	Statistics for Data Science
3	CS 25300	Data Structures and Algorithms for DS/AI
4-5	MA 26100 or MA 27101	Multivariate Calculus
3	MA 35100	Elementary Linear Algebra
3	MA/ or STAT 41600	Probability
3	CS 37300/ or MA 37400	Data Mining and Machine Learning/ or Mathematical Foundations for Machine Learning
3	STAT 41700	Statistical Theory
3	MA 37500	Introduction to Discrete Mathematics
3	MA 42100	Linear Programming and Optimization Techniques
3	MA 43200	Elementary Stochastic Processes
3	CS 34800/ or MA 34900	Information Systems/ or Signals and Systems for Mathematicians
3	MA 34100/ or MA 44000	Foundations of Analysis/ or Honors Real Analysis I
3	CS 44100 DSC	Data Science Capstone (recommended option) or Capstone Experience

2024-2025 Data Science Computer Science Selectives Course Options (Choose 1)

Credits	Course Number	Course Description
3	CS 31400	Numerical Methods
3	CS 38100	Introduction to the Analysis of Algorithms
3	CS 44000	Large Scale Data Analytics
3	CS 47100	Introduction to Artificial Intelligence
3	CS 47500	Human Computer Interaction

2024-2025 Data Science Mathematics Selective Course Options (Choose 1)

Credits	Course Number	Course Description
3	MA 42800	Introduction to Fourier Analysis
3	MA 44200	Honors Real Analysis II

2024-2025 Data Science Ethics Selective Course Options (Choose 1)

Credits	Course Number	Course Description
3	ILS 23000	Data Science & Society: Ethical, Legal, Social Issues
3	PHIL 20700	Ethics For Technology, Engineering, And Design
3	PHIL 20800	Ethics Of Data Science