

Illinois State University
Department of Mathematics
Data Science and Computational Mathematics sequence

The Data Science and Computational Mathematics sequence at Illinois State University is designed to equip students with a solid mathematics and statistics background as well as advanced computer programming skills required for modern data analysis. Students from this sequence can enter doctoral programs or be ready for employment in industries such as financial firms, healthcare systems, manufacturing, technology, business, education, consulting firms, and government.

Major Requirements

Minimum required credit hours: 55 (min. of 45 credit hours of Mathematics courses)

Take the following required courses (42 hours):

MAT 145 Calculus I (4 hours)
MAT 146 Calculus II (4 hours)
MAT 147 Calculus III (4 hours)
MAT 175 Elementary Linear Algebra (4 hours)
MAT 252 Introduction to Statistics with Applications (3 hours)
MAT 260 Discrete Mathematics (4 hours)
MAT 350 Applied Probability Models (4 hours)
IT 166 Python Programming for Science and Data Analysis (4 hours)
IT 168 Structured Problem Solving using the computer (4 hours)
IT 179 Introduction to Data Structures (3 hours)
IT 180 C++ Programming (1 hour)
IT 279 Algorithms and Data Structures (3 hours)

Note: IT courses are not counted towards the min. of 45 credit hours required in Mathematics courses.

Complete the Data Science or the Computational Mathematics concentration

Data Science Concentration (min. of 17 additional credit hours)

MAT 351 Statistics and Data Analysis (4 hours)
MAT 355 Generalized Linear Models and Predictive Modeling (4 hours)

Take a minimum of 3 courses (9 credit hours) from the following:

IT 244, IT 348, IT 352, MAT 353, MAT 354, MAT 356, MAT 443, MAT 450, MAT 453, MAT 455, MAT 456, MAT 458

Computational Mathematics Concentration (min. of 13 additional credit hours)

MAT 363 Graph Theory (4 hours)

Take at least 3 courses from the following two groups with a minimum of 2 courses from Group 1

Group 1: IT 244, IT 328, MAT 236, MAT 247, MAT 268, MAT 337, MAT 340, MAT 361, MAT 362

Group 2: MAT 351, MAT 355, MAT 443, MAT 45

Data Science and Computational Mathematics sequence - Sample Four-Year Plans

Data Science Concentration		Computational Mathematics Concentration	
YEAR 1		YEAR 1	
Fall	Spring	Fall	Spring
MAT 145 Calculus I	MAT 146 Calculus II	MAT 145 Calculus I	MAT 146 Calculus II
COM 110 or ENG 101	ENG 101 or COM 110	COM 110 or ENG 101	ENG 101 or COM 110
GE Natural Science	GE Natural Science	GE Natural Science	GE Natural Science
GE Individual and Civic Life	IT 166	GE Individual and Civic Life	IT 166
IT 168	GE US Traditions	IT 168	GE US Traditions
YEAR 2		YEAR 2	
Fall	Spring	Fall	Spring
MAT 147 Calculus III	MAT 175	MAT 147 Calculus III	MAT 175
MAT 252	IT 180	MAT 252	IT 180
IT 179	MAT 350	IT 179	MAT 350
GE Language in the Humanities	GE Fine Arts	GE Language in the Humanities	GE Fine Arts
GE Social Science	GE Humanities	GE Social Science	GE Humanities
YEAR 3		YEAR 3	
Fall	Spring	Fall	Spring
MAT 260	MAT 355	MAT 260	MAT/IT- c1* or c2*
MAT 351	IT/MAT-d*	MAT/IT- c1* or c2*	MAT/IT- c1* or c2*
IT-pre*	IT 279	IT-pre*	IT 279
LAN 112	IT 261	LAN 112	IT 261
YEAR 4		YEAR 4	
Fall	Spring	Fall	Spring
IT/MAT-d*	IT/MAT-d*	MAT 363	MAT/IT- c1* or c2*
IT/MAT-d*	IT/MAT-d*	MAT/IT- c1* or c2*	MAT/IT- c1* or c2*
University Wide Elective	University Wide Elective	University Wide Elective	University Wide Elective
IT 244	IT 344	IT 244	IT 344

IT-pre*: IT 254 or IT 225 - prerequisite for IT 261 (which is required)

IT/MAT-d*: IT 244 or IT 348 or IT 352 or MAT 353 or MAT 354 or MAT 356 or MAT 443 or MAT 450 or MAT 453 or MAT 455 or MAT 456 or MAT 458 - data science concentration elective

MAT/IT-c1*: IT 244 or IT 328 or MAT 236 or MAT 237 or MAT 268 or MAT 337 or MAT 340 or MAT 361 or MAT 362 - computational mathematics concentration elective (group 1: at least two courses must be from group 1)

MAT/IT-c2*: MAT 351 or MAT 355 or MAT 443 or MAT 455 - computational math concentration elective (group 2)

Note: Only seniors with good standing will be allowed to take a graduate-level course (courses numbered 400 or higher), provided the Graduate School gives approval.

Graduation Requirements: 120 hours, 42 senior college hours (200 and 300 level courses), and 39 General Education Program hours or 36 hours with an exemption. If the program is a BS program, show the BS-SMT degree requirement. If the program is from CAS, show Foreign Language Requirement (LAN 111/LAN 112). A minimum Mathematics GPA of 2.00 and an overall GPA of 2.0 are also required for graduation. Confirm General Education requirement exemptions on the General Education page of the current Academic Catalog. **For complete, official information, consult your catalog.**

Contact Dr. Maochao Xu, Graduate Director, for more information.

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