Proposed BS Applied Mathematics + AI and BS Statistics + AI

The proposed Bachelor of Science in Applied Mathematics + AI and Bachelor of Science in Statistics + AI programs are best understood as our existing BS Applied Mathematics and BS Statistics degrees with a fixed, integrated AI “minor” composed of the Certificate in AI Fluency and the Certificate in AI Management.

In other words, these are not fundamentally new degree programs. They preserve the full mathematical and statistical core of the original curricula while replacing the traditional minor requirement with six courses drawn from the two AI certificates. This redesign embeds structured AI competencies directly into the degree without altering the identity, rigor, or required mathematics content of either program.

This approach ensures that all students in the +AI pathways take the same required mathematics and statistics courses as students in the original degrees. As a result, these programs will not cannibalize existing enrollments. On the contrary, any increase in enrollment driven by the +AI designation will directly increase participation in our core AMAT and Statistics courses.

The motivation for this enhancement is the growing demand for graduates who combine strong quantitative foundations with practical AI fluency. Employers across sectors increasingly seek professionals who can integrate mathematical reasoning, statistical modeling, and computational thinking with applied AI skills. These pathways respond to that demand while strengthening, rather than diluting, our existing Applied Mathematics and Statistics programs.

These degrees are not intended to function as dedicated AI research programs or to train AI researchers. While students will be well prepared for advanced study, the primary goal is to produce quantitatively grounded professionals with applied AI fluency. If future demand warrants, the department may consider developing a separate, more technically specialized AI research degree.

Please see our original degree programs here

BS Applied Mathematics

BS Statistics

The structure of the proposed BS Applied Mathematics + AI and BS Statistics + AI were approved by the AMAT Undergraduate Studies Committee on Feb 19th 2026.

Committee members: Michael Pelsmajer, Rob Ellis, Despina Stasi, Kiah Ong

Proposed updates to the BS Applied Mathematics curriculum to incorporate the AI certificates coursework

Bachelor of Science in Applied Mathematics

OVERVIEW | PROGRAM REQUIREMENTS | SAMPLE CURRICULUM | SPECIALIZATIONS

Required Courses

Change to 45

Applied Mathematics Requirements		**(42)**
MATH 100	Introduction to the Profession	3
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 230	Introduction to Discrete Math	3
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4
MATH 332	Elementary Linear Algebra	3
MATH 350	Introduction to Computational Mathematics	3
MATH 380	Introduction to Mathematical Modeling	3
MATH 400	Real Analysis	3
Select one of the following:		3
MATH 410	Number Theory	3
MATH 430	Applied Algebra	3
MATH 431	Computational Algebraic Geometry	3
MATH 454	Graph Theory and Applications	3
MATH 475	Probability	3
Applied Mathematics Electives		**(18)**
Select 18 credit hours [1]		18

Change to 15

Changes to the required courses: Add STAT 225 or MATH 476

Original total credit (42), now at (45)

Requiring STAT 225 / MATH 476 increases the required Applied Mathematics credits from 42 to 45 and correspondingly reduces electives from 18 to 15. This effectively fixes one Applied Mathematics elective for students, ensuring consistent statistical preparation while preserving the overall structure of the degree.

Computer Science Requirements		**(4-6)**
Select one of the following sequences:		4-6
CS 115 & CS 116	Object-Oriented Programming I and Object-Oriented Programming II	4
CS 104 & CS 201	Introduction to Computer Programming for Engineers and Accelerated Introduction to Computer Science	6
CS 105 & CS 201	Introduction to Computer Programming and Accelerated Introduction to Computer Science	6
Science Requirement		**(4)**
PHYS 123	General Physics I: Mechanics	4
Science Electives		**(6)**
Select six credit hours		6
Humanities and Social Science Requirements		**(21)**
See Illinois Tech Core Curriculum, sections B and C		21
Interprofessional Projects (IPRO)		**(6)**
See Illinois Tech Core Curriculum, section E		6

None of the above requirements have any changes.

The minor requirement will be changed.

Minor Requirement	**(15)**
Select five related courses from an area outside of applied mathematics	15

Part (i). Students will now take

CS 180	Artificial Intelligence Foundations	3
COM 200	AI, Data, and Communications	3
MATH 123	AI for Computational Mathematics and Coding	3

for the Certificate in AI Fluency.

Part (ii). To complete the Certificate in AI Management, students must take one course from each of the three designated categories. For the third category, *Ethics and Responsible Use of AI*, the AMAT Undergraduate Studies Committee has specified that students must choose one of the following courses: PHIL 381, DS 261, PHIL 372, or PHIL 380.

Data Literacy		**(3)**
Choose 1 of the 2 courses below		3
DS 151	Introduction to Data Science	3
BUS 102	Introduction to Business Analytics	3
Organizational transformation through AI		**(3)**
BUS 432	Artificial Intelligence in Business	3
Ethics and Responsible Use of AI		**(3)**
Choose 1 of the following 4 courses		3
PHIL 381	Artificial Intelligence, Philosophy and Ethics	3
DS 261	Ethics and Privacy in Data Science	3
PHIL 372	Ethics of Technology and Communication	3
PHIL 380	Topics in Philosophy	3

Select from these 3 classes only

Because COM 200 and certain PHIL 3XX courses also satisfy the Humanities requirement, this creates overlap in credit counting. As a result, the available free elective credits increase from 2–4 to 5–7.

Free Electives		**(2-4)**
Select 2-4 credits [2]		2-4

Change to 5-7

Minimum degree credits required: 120

Proposed updates to the BS Statistics curriculum to incorporate the AI certificates coursework

Aside from replacing the minor requirement with six courses from the AI certificate programs (as in the BS Applied Mathematics + AI degree), all other requirements remain unchanged. Because of credit overlap with core courses, the free elective allowance increases from 0–2 credits to 3–5 credits.

Bachelor of Science in Statistics

PROGRAM REQUIREMENTS | SAMPLE CURRICULUM

Required Courses

Applied Mathematics Requirements		**(29)**
MATH 100 or DS 100	Introduction to the Profession Introduction to the Profession	3
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 230	Introduction to Discrete Math	3
MATH 251	Multivariate and Vector Calculus	4
MATH 332	Elementary Linear Algebra	3
MATH 350	Introduction to Computational Mathematics	3
MATH 435	Linear Optimization	3
Statistics Requirements		**(15)**
STAT 225	Introductory Statistics	3
MATH 446	Introduction to Time Series	3
MATH 475	Probability	3
MATH 476	Statistics	3
MATH 484	Regression	3

Applied Mathematics Electives		**(15)**
Select 15 credit hours from the following courses, or any other approved AMAT elective: [1]		15
MATH 252	Introduction to Differential Equations	4
MATH 380	Introduction to Mathematical Modeling	3
MATH 400	Real Analysis	3
MATH 481	Introduction to Stochastic Processes	3
MATH 483	Design and Analysis of Experiments	3
CS 422	Data Mining	3

Computer Science Requirements		**(7-9)**
Select one of the following sequences:		4-6
CS 115 & CS 116	Object-Oriented Programming I and Object-Oriented Programming II	4
CS 104 & CS 201	Introduction to Computer Programming for Engineers and Accelerated Introduction to Computer Science	6
CS 105 & CS 201	Introduction to Computer Programming and Accelerated Introduction to Computer Science	6
CS 331	Data Structures and Algorithms	3
Natural Science and Engineering Requirements		**(10)**
See Illinois Tech Core Curriculum, section D		10
Humanities and Social Science Requirements		**(21)**
See Illinois Tech Core Curriculum, sections B and C		21
Interprofessional Projects (IPRO)		**(6)**
See Illinois Tech Core Curriculum, section E		6
Free Electives		**(0-2)**
Select up to two credit hours		0-2

Change to 3 to 5

Minimum degree credits required: 120