

# B.S. Artificial Intelligence Sciences

## Program Admissions Requirements

There are no program admission requirements for the degree and major.

## General Education

The listing below includes program requirements that also fulfill General Education requirements.

Code	Title	Credits
Objective 1		6
Objective 2		3
Objective 3- MATH 1170		4
Objective 4- PHIL 1103		6
Objective 5- PHYS 2211		7
Objective 6		6
<b>Students must fulfill Objective 7 or Objective 8</b>		<b>3</b>
Objective 7- CS 1181		
Objective 8		
Objective 9		3
<b>Total Credits</b>		<b>38</b>

## Major Requirements

Code	Title	Credits
PHIL 1103	Introduction to Ethics (Partially Fulfills General Education Objective 4)	3
ENGL 3307	Professional and Technical Writing	3
PHYS 2211	Engineering Physics I (Partially satisfies General Education Objective 5)	4
CS 1181	Computer Science and Programming I (Fulfills General Education Objective 7)	3
CS 1337	Computer Organization and Architecture	3
CS 2281	Data Structures	4
CS 3310	Databases	3
CS/MATH 3332	Data Science and Applied Machine Learning	3
MATH 1170	Calculus I (Fulfills General Education Objective 3)	4
MATH 1175	Calculus II	4
MATH 2240	Linear Algebra	3
MATH 3350	Statistics for Scientists	3
MATH 3352	Introduction to Probability	3
<b>Choose Six credits from the following courses:</b>		<b>6</b>
MATH 4405	Numerical Linear Algebra	
MATH 4441	Introduction to Numerical Analysis I	
MATH 4445	Optimization Methods and Their Applications	
CS 4433	Applied Neural Networks (Fulfills CS track requirement)	
<b>In Addition: Choose one of the following tracks:</b>		
Track 1 Concentration in Mathematics & Statistics		33-34

Track 2 Concentration in computer Science	33-36
<b>Total Credits</b>	<b>81-84</b>

## Track 1: Concentration in Mathematics & Statistics

The following courses are required to complete Track 1.

Code	Title	Credits
<b>Choose one of the following two courses:</b>		<b>3-4</b>
MATH 2275	Calculus III	
MATH 3360	Differential Equations	
MATH 3310	Mathematical Modeling	3
MATH 4450	Mathematical Statistics I	3
MATH 4457	Applied Regression Analysis	3
MATH 4459	Applied Multivariate Analysis	3
MATH 4477	Theoretical Foundations of Deep Learning	3
<b>Choose one additional course from the following courses</b>		<b>3</b>
MATH 4405	Numerical Linear Algebra	
MATH 4441	Introduction to Numerical Analysis I	
MATH 4445	Optimization Methods and Their Applications	
CS 4433	Applied Neural Networks	

## Track 1 Electives 12

Track 1 Electives: A student must take 12 additional credits from the following list to complete the degree. The following courses are pre-approved.

MATH 2275	Calculus III	
MATH 3326	Elementary Analysis	
MATH 3360	Differential Equations	
MATH 4441	Introduction to Numerical Analysis I	
MATH 4451	Mathematical Statistics II	
MATH 4453	Topics in Statistics <sup>1</sup>	
MATH 4458	Experimental Design	
MATH 4463	Topics in Applied Mathematics <sup>1</sup>	
MATH 4465	Partial Differential Equations	
<b>Total Credits</b>		<b>33-34</b>

<sup>1</sup> These courses are 1-3 credit courses, repeated for up to 3 credits.

## Track 2: Concentration in Computer Science

The following courses are required to complete Track 2.

Code	Title	Credits
CS 1185	Introduction to Artificial Intelligence Tools	3
MATH/CS 1187 or MATH 2287	Applied Discrete Structures Foundations of Mathematics	3
CS 3309	Advanced Object-Oriented Programming	3
CS 4412	Algorithms	3

CS 4433	Applied Neural Networks (if not taken above)	3
CS 4434 or CS 4435	Generative Artificial Intelligence Machine Learning Operations	3
CS 4461	Secure Operating Systems	3
CS 4470	High-Performance Computing	3
CS 4478	Machine Learning Algorithms	3
CS 4488	Capstone Project	3
CS 4472 or CS 4473 or CS 4479	Artificial Intelligence Algorithms Computational Creativity Natural Language Processing	3
CS 4434 or CS 4435 or CS 4448 or other CS or ECE 44xx Elective(s)	Generative Artificial Intelligence Machine Learning Operations Secure Artificial Intelligence	3
<b>Total Credits</b>		<b>33-36</b>

**Math Concentration Degree Totals**

Code	Title	Credits
	Program Admission Requirements	0
	General Education	38
	Major Requirements (w/o General Education)	67-68
	Upper Division Free Electives	0
	Free Electives	14-15
	<b>Total Credits</b>	<b>120</b>

**Computer Science Concentration Degree Totals**

Code	Title	Credits
	Program Admission Requirements	0
	General Education	38
	Major Requirements (w/o General Education)	67-70
	Upper Division Free Electives	0
	Free Electives	12-15
	<b>Total Credits</b>	<b>120</b>

ISU Degree Requirements (<http://coursecat.isu.edu/undergraduate/degree requirements/>)

ISU General Education (<http://coursecat.isu.edu/undergraduate/academic information/general education/>)

Major Academic Plan (MAP) (<https://www.isu.edu/advising/maps/>)