

# ARTIFICIAL INTELLIGENCE (B.S.)

Code	Title	Hours
<b>Major Requirements</b>		
CS 1120	Computer Science I	4
CS 1121	Computer Science II	3
AIML 1101	AI Fundamentals: Impacts, Ethics, and Applications (AI Fundamentals)	3
AIML 2001	Introduction to Machine Learning (Intro to Machine Learning)	3
ENGR 2120	Python Programming Essentials	3
CYB 2200	Secure Coding and Analysis	3
CS 3195	Analysis of Algorithms	3
CS 4622	Applied Data Science with Python	3
CS 4701	Artificial Intelligence	3
CS 4715	Deep Learning	3
CS 4741	Natural Language Processing	3
CS 4771	Python for Machine Learning	3
AIML 4010	Contemporary Issues in AI (Senior Seminar)	1
AIML 4800	AI Senior Capstone Design I (Senior Capstone I)	3
AIML 4810	AI Senior Capstone Design II (Senior Capstone II)	3
<b>Mathematic</b>		
MATH 1170	Calculus I	4
MATH 1750	Calculus II	4
MATH 1760	Discrete Mathematics	3
MATH 3300	Linear Algebra	3
<b>Statistics</b>		
STAT 3010	Probability and Statistics	3
or STAT 2510	Statistical Methods	
<b>Technical Writing</b>		
ENGL 2020	Technical Writing I	3
or ENGL 3170	Technical Writing II	
<b>In Addition: Students may choose the General AI Studies emphasis or one of the five emphases. The capstone project for students in an emphasis must be directly relevant to their selected emphasis area.</b>		<b>21</b>
General AI Studies		
Emphasis 1: Robotics AI		
Emphasis 2: AI Cyber		
Emphasis 3: Secure AI		
Emphasis 4: AI Infrastructure & Operations		
Emphasis 5: AI in Data Science		
<b>Total Hours</b>		<b>85</b>

## A. General AI Studies Emphasis

Code	Title	Hours
Select seven elective courses with a CS, CYB, or AIML prefix. At least four of the seven elective courses must be upper division.		21
<b>Total Hours</b>		<b>21</b>

Courses to total 120 credits for this degree

## B. Robotics AI Emphasis

Code	Title	Hours
CS 1550	Computer Organization and Architecture	3
CS 2XXX	Course CS 2XXX Not Found (Introduction to Robotic Systems)	3
CS 2240	Computer Operating Systems	3
Select 4 courses from the list below:		12
CS 4502	Real-Time Operating Systems	
CS 4543	Embedded Systems	
CS 4553	Robotic Systems Engineering I	
CS 4554	Robotic Systems Engineering II	
CS 4615	Computational Biology: Sequence Analysis	
CS 4571	AI Data Analysis for Industrial Applications	
CS 4731	Evolutionary Computation	
CS 4885	Machine Vision	
<b>Total Hours</b>		<b>21</b>

Courses to total 120 credits for this degree

## C. AI Cyber Emphasis

Code	Title	Hours
CYB 1100	Cybersecurity and Privacy	3
CYB 2100	Cybersecurity Architectures and Management	3
CYB 3100	Cybersecurity Technical Foundations	3
CYB 3300	Networking Fundamentals	3
CYB 3400	Network Defense	3
CYB 4400	Software Vulnerability Analysis	3
CYB 4442	IoT and CPS Security (IoT and CPS Security)	3
<b>Total Hours</b>		<b>21</b>

Courses to total 120 credits for this degree

## D. Secure AI Emphasis

Code	Title	Hours
CS 1550	Computer Organization and Architecture	3
CS 2240	Computer Operating Systems	3
CYB 3100	Cybersecurity Technical Foundations	3
CYB 3300	Networking Fundamentals	3
CYB 3400	Network Defense	3
CYB 3500	Operating System Defense	3
CS 4727	Adversarial Machine Learning	3
<b>Total Hours</b>		<b>21</b>

Courses to total 120 credits for this degree

## E. AI Infrastructure & Operations Emphasis

Code	Title	Hours
<b>Emphasis: AI Infrastructure &amp; Operations</b>		
CS 1550	Computer Organization and Architecture	3
CS 2240	Computer Operating Systems	3
CYB 3300	Networking Fundamentals	3
CS 4211	Parallel Programming	3
Select 3 courses from the list below:		9
CS 3600	Database Systems	

CS 4602	Database Management Systems Design	
CS 4241	Advanced Operating Systems	
CS 4441	Multi-User Games and Virtual Environments	
CS 4XXX	Course CS 4XXX Not Found (Digital Twins )	
Elective course with CS, CYB, or AIML prefix		
<b>Total Hours</b>		<b>21</b>

Courses to total 120 credits for this degree

### F. AI in Data Science Emphasis

Code	Title	Hours
CS 3600	Database Systems	4
CS 4621	Data Science	3
CS 4625	Semantic Web and Open Data	3
Select 4 courses from the list below:		11
CS 4602	Database Management Systems Design	
CS 4712	Machine Learning	
CS 4718	Convex Optimization	
CS 4727	Adversarial Machine Learning	
STAT 4510	Probability Theory	
STAT 4520	Mathematical Statistics	
Elective course with CS, CYB, or AIML prefix		
<b>Total Hours</b>		<b>21</b>

Courses to total 120 credits for this degree.

ourses to total at least 120 credits for this degree, not counting prerequisites that may be required for registration in MATH 1170 or ENGL 1102. Note: students whose standardized test scores allow them to register for ENGL 1102 without first taking ENGL 1101 will automatically receive credit for ENGL 1101 upon successful completion of ENGL 1102.

Students who place directly into MATH 1170 are required to enroll in an additional elective to meet the minimum 120 credits for a baccalaureate degree (J-1-a (<https://catalog.uidaho.edu/general-requirements-academic-procedures/j-general-requirements-baccalaureate-degrees/>)).

#### General AI Emphasis

Fall Term 1		Hours
COMM 1101	Fundamentals of Oral Communication	3
CS 1120	Computer Science I	4
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
MATH 1144	Precalculus II: Trigonometry	1
Humanistic and Artistic Ways of Knowing Course		3
<b>Hours</b>		<b>17</b>
Spring Term 1		
AIML 1101	AI Fundamentals: Impacts, Ethics, and Applications	3
CS 1121	Computer Science II	3
ENGL 1102	Writing and Rhetoric II	3
MATH 1170	Calculus I	4
MATH 1760	Discrete Mathematics	3
<b>Hours</b>		<b>16</b>
Fall Term 2		
ENGR 2120	Python Programming Essentials	3
MATH 1750	Calculus II	4
Major Elective, Technical Elective Course		3

Scientific Ways of Knowing (course with Lab)		4
<b>Hours</b>		<b>14</b>
Spring Term 2		
AIML 2001	Introduction to Machine Learning	3
CYB 2200	Secure Coding and Analysis	3
STAT 3010 or STAT 2510	Probability and Statistics or Statistical Methods	3
Humanistic and Artistic Ways of Knowing Course		3
Scientific Ways of Knowing Course (CORS recommended)		3
<b>Hours</b>		<b>15</b>
Fall Term 3		
CS 3195	Analysis of Algorithms	3
MATH 3300	Linear Algebra	3
American Experience Course		3
International Course		3
Major Elective, Technical Elective Course		3
<b>Hours</b>		<b>15</b>
Spring Term 3		
CS 4622	Applied Data Science with Python	3
CS 4771	Python for Machine Learning	3
ENGL 3170 or ENGL 2020	Technical Writing II or Technical Writing I	3
Major Elective, Technical Elective Course		3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
Fall Term 4		
AIML 4800	AI Senior Capstone Design I	3
CS 4715	Deep Learning	3
Major Elective, Technical Elective Course		3
Major Elective, Technical Elective Course		3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
Spring Term 4		
AIML 4010	Contemporary Issues in AI	1
AIML 4810	AI Senior Capstone Design II	3
CS 4701	Artificial Intelligence	3
CS 4741	Natural Language Processing	3
Major Elective, Technical Elective Course		3
Major Elective, Technical Elective Course		3
<b>Hours</b>		<b>16</b>
<b>Total Hours</b>		<b>123</b>

#### Robotics AI Emphasis

Fall Term 1		Hours
COMM 1101	Fundamentals of Oral Communication	3
CS 1120	Computer Science I	4
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
MATH 1144	Precalculus II: Trigonometry	1
Humanistic and Artistic Ways of Knowing Course		3
<b>Hours</b>		<b>17</b>
Spring Term 1		
AIML 1101	AI Fundamentals: Impacts, Ethics, and Applications	3
CS 1121	Computer Science II	3
ENGL 1102	Writing and Rhetoric II	3
MATH 1170	Calculus I	4
MATH 1760	Discrete Mathematics	3
<b>Hours</b>		<b>16</b>
Fall Term 2		
CS 1550	Computer Organization and Architecture	3
ENGR 2120	Python Programming Essentials	3

MATH 1750	Calculus II	4
Scientific Ways of Knowing Course (Course with lab)		4
<b>Hours</b>		<b>14</b>
<b>Spring Term 2</b>		
AIML 2001	Introduction to Machine Learning	3
CYB 2200	Secure Coding and Analysis	3
STAT 3010 or STAT 2510	Probability and Statistics or Statistical Methods	3
Humanistic and Artistic Ways of Knowing Course		3
Scientific Ways of Knowing Course (CORS recommended)		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 3</b>		
CS 3195	Analysis of Algorithms	3
CS 2XXX	Course CS 2XXX Not Found	3
MATH 3300	Linear Algebra	3
American Experience Course		3
International Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 3</b>		
CS 4622	Applied Data Science with Python	3
CS 4771	Python for Machine Learning	3
CS 2240	Computer Operating Systems	3
ENGL 3170 or ENGL 2020	Technical Writing II or Technical Writing I	3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
AIML 4800	AI Senior Capstone Design I	3
CS 4715	Deep Learning	3
Major Elective, Technical Elective Course		3
Major Elective, Technical Elective Course		3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 4</b>		
AIML 4010	Contemporary Issues in AI	1
AIML 4810	AI Senior Capstone Design II	3
CS 4701	Artificial Intelligence	3
CS 4741	Natural Language Processing	3
Major Elective, Technical Elective Course		3
Major Elective, Technical Elective Course		3
<b>Hours</b>		<b>16</b>
<b>Total Hours</b>		<b>123</b>

### AI Cyber Emphasis

		Hours
<b>Fall Term 1</b>		
COMM 1101	Fundamentals of Oral Communication	3
CS 1120	Computer Science I	4
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
MATH 1144	Precalculus II: Trigonometry	1
Humanistic and Artistic Ways of Knowing Course		3
<b>Hours</b>		<b>17</b>
<b>Spring Term 1</b>		
AIML 1101	AI Fundamentals: Impacts, Ethics, and Applications	3
CS 1121	Computer Science II	3
ENGL 1102	Writing and Rhetoric II	3
MATH 1170	Calculus I	4
MATH 1760	Discrete Mathematics	3
<b>Hours</b>		<b>16</b>
<b>Fall Term 2</b>		
CYB 1100	Cybersecurity and Privacy	3

ENGR 2120	Python Programming Essentials	3
MATH 1750	Calculus II	4
Scientific Ways of Knowing Course (Course with Lab)		4
<b>Hours</b>		<b>14</b>
<b>Spring Term 2</b>		
AIML 2001	Introduction to Machine Learning	3
CYB 2200	Secure Coding and Analysis	3
STAT 3010 or STAT 2510	Probability and Statistics or Statistical Methods	3
Humanistic and Artistic Ways of Knowing Course		3
Scientific Ways of Knowing Course (CORS recommended)		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 3</b>		
CS 3195	Analysis of Algorithms	3
CYB 2100	Cybersecurity Architectures and Management	3
MATH 3300	Linear Algebra	3
International Course		3
American Experience Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 3</b>		
CS 4622	Applied Data Science with Python	3
CS 4771	Python for Machine Learning	3
CYB 3100	Cybersecurity Technical Foundations	3
ENGL 3170 or ENGL 2020	Technical Writing II or Technical Writing I	3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
AIML 4800	AI Senior Capstone Design I	3
CS 4715	Deep Learning	3
CYB 3300	Networking Fundamentals	3
CYB 4400	Software Vulnerability Analysis	3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 4</b>		
AIML 4010	Contemporary Issues in AI	1
AIML 4810	AI Senior Capstone Design II	3
CS 4701	Artificial Intelligence	3
CS 4741	Natural Language Processing	3
CYB 3400	Network Defense	3
CYB 4442	IoT and CPS Security	3
<b>Hours</b>		<b>16</b>
<b>Total Hours</b>		<b>123</b>

### Secure AI Emphasis

		Hours
<b>Fall Term 1</b>		
COMM 1101	Fundamentals of Oral Communication	3
CS 1120	Computer Science I	4
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
MATH 1144	Precalculus II: Trigonometry	1
Humanistic and Artistic Ways of Knowing Course		3
<b>Hours</b>		<b>17</b>
<b>Spring Term 1</b>		
AIML 1101	AI Fundamentals: Impacts, Ethics, and Applications	3
CS 1121	Computer Science II	3
ENGL 1102	Writing and Rhetoric II	3
MATH 1170	Calculus I	4
MATH 1760	Discrete Mathematics	3
<b>Hours</b>		<b>16</b>

## 4 Artificial Intelligence (B.S.)

<b>Fall Term 2</b>		
CS 1550	Computer Organization and Architecture	3
ENGR 2120	Python Programming Essentials	3
MATH 1750	Calculus II	4
Scientific Ways of Knowing Course (Course with Lab)		4
<b>Hours</b>		<b>14</b>
<b>Spring Term 2</b>		
AIML 2001	Introduction to Machine Learning	3
CYB 2200	Secure Coding and Analysis	3
STAT 3010 or STAT 2510	Probability and Statistics or Statistical Methods	3
Humanistic and Artistic Ways of Knowing Course		3
Scientific Ways of Knowing Course (CORS recommended)		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 3</b>		
CS 3195	Analysis of Algorithms	3
CS 2240	Computer Operating Systems	3
MATH 3300	Linear Algebra	3
American Experience Course		3
International Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 3</b>		
CS 4622	Applied Data Science with Python	3
CS 4771	Python for Machine Learning	3
CYB 3100	Cybersecurity Technical Foundations	3
ENGL 3170 or ENGL 2020	Technical Writing II or Technical Writing I	3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
AIML 4800	AI Senior Capstone Design I	3
CS 4715	Deep Learning	3
CYB 3300	Networking Fundamentals	3
CYB 3500	Operating System Defense	3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 4</b>		
AIML 4010	Contemporary Issues in AI	1
AIML 4810	AI Senior Capstone Design II	3
CS 4701	Artificial Intelligence	3
CS 4741	Natural Language Processing	3
CS 4727	Adversarial Machine Learning	3
CYB 3400	Network Defense	3
<b>Hours</b>		<b>16</b>
<b>Total Hours</b>		<b>123</b>

### AI Infrastructure & Operations Emphasis

		Hours
<b>Fall Term 1</b>		
COMM 1101	Fundamentals of Oral Communication	3
CS 1120	Computer Science I	4
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
MATH 1144	Precalculus II: Trigonometry	1
Humanistic and Artistic Ways of Knowing Course		3
<b>Hours</b>		<b>17</b>
<b>Spring Term 1</b>		
AIML 1101	AI Fundamentals: Impacts, Ethics, and Applications	3
CS 1121	Computer Science II	3
ENGL 1102	Writing and Rhetoric II	3
MATH 1170	Calculus I	4

MATH 1760	Discrete Mathematics	3
<b>Hours</b>		<b>16</b>
<b>Fall Term 2</b>		
CS 1550	Computer Organization and Architecture	3
ENGR 2120	Python Programming Essentials	3
MATH 1750	Calculus II	4
Scientific Ways of Knowing Course (Course with lab)		4
<b>Hours</b>		<b>14</b>
<b>Spring Term 2</b>		
AIML 2001	Introduction to Machine Learning	3
CYB 2200	Secure Coding and Analysis	3
STAT 3010 or STAT 2510	Probability and Statistics or Statistical Methods	3
Humanistic and Artistic Ways of Knowing Course		3
Scientific Ways of Knowing Course (CORS recommended)		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 3</b>		
CS 3195	Analysis of Algorithms	3
CS 2240	Computer Operating Systems	3
MATH 3300	Linear Algebra	3
American Experience Course		3
International Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 3</b>		
CS 4622	Applied Data Science with Python	3
CS 4771	Python for Machine Learning	3
CS 4211	Parallel Programming	3
ENGL 3170 or ENGL 2020	Technical Writing II or Technical Writing I	3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
AIML 4800	AI Senior Capstone Design I	3
CS 4715	Deep Learning	3
CYB 3300	Networking Fundamentals	3
Major Elective, Technical Elective Course		3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 4</b>		
AIML 4010	Contemporary Issues in AI	1
AIML 4810	AI Senior Capstone Design II	3
CS 4701	Artificial Intelligence	3
CS 4741	Natural Language Processing	3
Major Elective, Technical Elective Course		3
Major Elective, Technical Elective Course		3
<b>Hours</b>		<b>16</b>
<b>Total Hours</b>		<b>123</b>

### AI in Data Science Emphasis

		Hours
<b>Fall Term 1</b>		
COMM 1101	Fundamentals of Oral Communication	3
CS 1120	Computer Science I	4
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
MATH 1144	Precalculus II: Trigonometry	1
Humanistic and Artistic Ways of Knowing Course		3
<b>Hours</b>		<b>17</b>
<b>Spring Term 1</b>		
AIML 1101	AI Fundamentals: Impacts, Ethics, and Applications	3
CS 1121	Computer Science II	3
ENGL 1102	Writing and Rhetoric II	3

MATH 1170	Calculus I	4
MATH 1760	Discrete Mathematics	3
<b>Hours</b>		<b>16</b>
<b>Fall Term 2</b>		
CS 1550	Computer Organization and Architecture	3
ENGR 2120	Python Programming Essentials	3
MATH 1750	Calculus II	4
Scientific Ways of Knowing Course (Course with lab)		4
<b>Hours</b>		<b>14</b>
<b>Spring Term 2</b>		
AIML 2001	Introduction to Machine Learning	3
CYB 2200	Secure Coding and Analysis	3
STAT 3010 or STAT 2510	Probability and Statistics or Statistical Methods	3
Humanistic and Artistic Ways of Knowing Course		3
Scientific Ways of Knowing Course (CORS recommended)		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 3</b>		
CS 3195	Analysis of Algorithms	3
CS 3600	Database Systems	4
MATH 3300	Linear Algebra	3
American Experience Course		3
International Course		3
<b>Hours</b>		<b>16</b>
<b>Spring Term 3</b>		
CS 4622	Applied Data Science with Python	3
CS 4771	Python for Machine Learning	3
ENGL 3170 or ENGL 2020	Technical Writing II or Technical Writing I	3
Major Elective, Technical Elective Course		3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Fall Term 4</b>		
AIML 4800	AI Senior Capstone Design I	3
CS 4715	Deep Learning	3
CS 4621	Data Science	3
Major Elective, Technical Elective Course		3
Social & Behavioral Ways of Knowing Course		3
<b>Hours</b>		<b>15</b>
<b>Spring Term 4</b>		
AIML 4010	Contemporary Issues in AI	1
AIML 4810	AI Senior Capstone Design II	3
CS 4701	Artificial Intelligence	3
CS 4741	Natural Language Processing	3
CS 4625	Semantic Web and Open Data	3
Major Elective, Technical Elective Course		3
<b>Hours</b>		<b>16</b>
<b>Total Hours</b>		<b>124</b>

- Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Apply appropriate AI theories, models, techniques, and tools throughout the AI lifecycle to design, implement, and evaluate solutions that meet stakeholders' needs.

The B.S. in AI program is designed to ensure that graduates achieve six defined student learning outcomes (LOs):

- Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
- Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.