

## BS in AI Science Frequently Asked Questions:

### Q: What is the goal of the BS in AI Science degree?

**A:** Anyone can learn how to use AI tools like Gemini, ChatGPT, NotebookLM, etc., but companies are increasingly interested in leveraging AI for internal use and client-facing products. They are looking for graduates who know how to use AI, and, more importantly, [how to build AI](#). How do LMs work, and how can you train one yourself? How do diffusion models work? What even is reinforcement learning and how can I use it in my company? How can we scale machine learning models so millions of people can use them? This degree helps you understand the answers to those questions.

Some job titles that you could consider with this degree include (but are not limited to):

- Data Science
- Data Analytics
- Data Modeling
- Data Warehousing
- Data Visualization
- Business Statistics
- Business Analytics
- Machine Learning Scientist
- Artificial Intelligence Scientist
- Machine Learning Engineer
- Generative AI Scientist

### Q: I'm interested in AI. What's the best way to be skilled at using AI?

**A:** The answer depends on what you mean by “being skilled at using AI,” your background, and how technical you want your skills to be. Let's start with what may be meant by *using AI*. AI—Artificial Intelligence—has been a field of research and study for decades. What is referred to as AI these days is often Generative AI tools like ChatGPT, but AI is much more than just that. So being skilled at AI could be as narrow as how to properly use generative AI tools, to something much more broadly applicable as to how you can integrate AI to complete a much larger set of tasks. Related to your background, if you want a low-barrier surface introduction to AI you could pursue something like [Boise State University's AI for All certificate](#). If you want a little more, you could pursue the [Data Science for STEM certificate](#). If you're specifically interested in having more skills in Generative AI, you could consider the [Generative Language AI certificate](#). Those are important skills, but this degree takes you a lot further in your technical and practical knowledge/skills of how AI works and how to build it yourself.

### Q: Isn't this just the Computer Science machine learning emphasis?

**A:** It's true that the ML emphasis has led to the AI Science degree, but there are important differences:

1. ECE courses in the CS major are not required; instead there is one ECE class specializing in AI hardware

2. Theory of Computation, Programming Languages, Software Dev in C, Algorithms, and Software Engineering—bread and butter courses that make a CS major what it is—are not required (though some are offered as electives).
3. Students still take OOP/Data structures courses, in parallel with data science, machine learning, and AI-related courses like Intro to AI, Natural Language Processing, Deep Learning
4. The BS in AI Science introduces new courses: Reinforcement Learning and ML in Production, and (soon!) Computer Vision. Whether these will be open to ML Emphasis students is under consideration.
5. There are 9 credits of electives that include CS, mechanical engineering, philosophy, and others are in the works.

**Q: Is the AI Science degree “less” than a standard CS degree?**

**A:** It depends on what you want to do for your day-to-day work after you graduate. If you want a software engineering / development job and don't really care whether it's AI/ML-related, like web development, testing, cloud, back end, or anything else as long as you get to write code, then CS is the right choice. If you want to be a machine learning engineer but still have solid CS chops, then pick the CS degree with the Machine Learning emphasis. If you want to be a Machine Learning or AI Engineer or have the door open to be an AI Scientist, then pick the BS in AI Science degree. Not taking the important CS courses like Programming Languages, Theory of Computation, Algorithms, and Software Engineering might make it feel like this degree is a bit watered down, but those courses are replaced by data science courses, theory of AI, machine learning algorithms, and you can opt for software engineering as an elective.

**Q. AI changes so fast. How will the BS in AI Science keep up?**

**A:** The same issue is a challenge in the CS major, so this really isn't different. One example: the CS 436 Natural Language Processing has been taught at Boise State since 2017. It has never been taught the same way twice because the field changes so rapidly. Many of the BS in AI courses are foundational, for example in 436 you learn about language models, and in the Applied Deep Learning course, you learn about tensorflow and [py]torch which are deep learning libraries so common, that pretty much every AI model (including ChatGPT) is build on one of them. Reinforcement Learning is another course that will likely change. The ML in Production class will also change, though the patterns of how companies productionize ML have settled down over the years. We'll do our best to keep up with new things (we are looking at offering an AI Agents course soon, for example).

**Q: Aren't you just chasing the latest bandwagon? Is AI really the future?**

**A:** Ten years ago, data science and machine learning were well established in academia and in some companies, but by 2015 more smaller companies were hiring data scientists and machine learning engineers. The trend towards AI has been happening for a long time, but the new AI tools like chatbots, code assist, and image generation, are very useful to many companies for tasks ranging from generating online content to programming and marketing. AI isn't a trend; LLMs like ChatGPT just accelerated it. There are trends within AI that we need to be aware of

that might come and go (e.g., RAG, Agents), but we all have the opportunity to introduce the new thing that is going to make AI better for everyone.

**Q. Is Python our only hope?**

**A:** At the moment, Python is the de-facto language of data science, machine learning and AI. Companies are behind that (Google makes tensorflow, Meta makes torch), but it's also the language used in data science teams across the world in companies and academia. Python also has libraries for web development, and so much more. Python is slow (dynamically typed), but GPUs make it so we can use Python more efficiently (at least in terms of speed, if not electricity). 10 years ago Java was the ML language and R was the data science language. Our department used to alternate Python and R as the language of choice in our grad-level data science course, but ultimately moved to Python due to demand. Another language might come along that knocks Python out of the top spot, but I don't see that happening anytime soon.

**Q. I am a first year/second year student in the CS degree with ML Emphasis? How easy would it be for me to switch to the AI Science degree?**

**A:** You are probably in the best situation to switch, if you so choose. The ML Emphasis requires CS 133, 233, 334, and so does the new AI Science degree. You are probably working through CS 121, 221, and 321. The AI Science degree requires those, too. You may have taken a course that isn't required for the BS in AI Science degree (e.g., one of the ECE courses or CS 354, 361), but those courses are definitely not a waste of time! The new degree also requires MATH 170, 175, 189, 360/361, and 301 just like the ML Emphasis.

**Q. I am a first year/second year student in the CS degree (no emphasis or an emphasis other than ML)? How difficult would it be for me to switch to the AI Science degree?**

**A:** Not difficult, though you may have taken a course or two that won't count towards the AI Science degree (e.g., ECE courses or CS 354, CS 361 are not required, for example). CS 121, 221, and 321 are required, so you're good there. So are 153, 155, 208, and 230 like the CS degree. You will have to take the foundational data science courses, CS 133 and 233 (though if you feel like you have ample Python experience, you can [take the challenge exam](#) for CS 133) which might feel like starting over, but they are very important foundational courses that prepare you for machine learning and beyond. Much of the MATH requirements are the same: MATH 170, 175, 189, 360/361 and the MATH elective you used to have is now required: MATH 301 (Linear Algebra).

**Q: I am a third/fourth year CS student and the AI Science degree sounds really good. What options do I have?**

**A:** If you are in the ML Emphasis, then you are about as close as you're going to get to the AI Science degree, minus a few courses. You could switch, though it will likely mean taking a few more classes. If you are a CS major not in the ML Emphasis, then switching might be more

difficult. BUT, there is an option for you: the CS master's degree. The master's degree won't have quite as many elective courses, but it does cover data science, machine learning, deep learning, natural language processing (where you learn about LLMs), social media mining, intro to AI, and others. If you are only now finding an interest in AI and you're nearly done with your CS degree, consider the master's degree.

**Q: Will the lower-division required courses be available every semester?**

**A:** CS 121, 221, 321, 208, and 133 are already taught every semester. CS 233 and 334 are only taught annually at the moment, but as we hire more faculty we hope to offer these courses more often. Most of the required MATH courses are already taught every semester. Some of the upper-division required courses are already taught at least annually, and Senior Design is taught every semester. The [four-year plan](#) helps you chart a path through even when courses are not taught every semester.

**Q: Should I choose AI over Cybersecurity? Both seem like good options.**

**A:** Both Cybersecurity and AI have bright futures. There are efforts towards trying to bridge AI and Cybersecurity, but it is challenging due to the sheer amount of technical knowledge one needs to have in each to be effective in either. Take a course in Cybersecurity and take a course in Data Science. If you like one over the other, keep going. If you like both, keep going. There are options: e.g., complete the BS in AI Science degree, the move to a masters more geared towards Cybersecurity.

**Q: I'm really confused as to the difference between Computer Science, Data Science, Machine Learning and AI. There seems to be an overlap between all three of them, but the differences also seem to matter.**

**A:** Let's start with Computer Science (CS) vs. Data Science (DS). CS students learn data structures, object-oriented programming, algorithms, and theory of comp (and related courses). DS doesn't care much about OOP or data structures because DS people get by with built-in data structures (e.g., lists, dictionaries, and pandas datatables). DS people work on data analysis, collecting, munging, and thinking about scientific questions relating to the data, which sometimes leads to using classifiers or other machine learning techniques to do prediction, evaluation, or modeling. Machine Learning (ML; usually termed "engineers") are like DSists because they deal with data and machine learning models, but [ML engineers usually take the prototype models made by DSists and productionize them](#) (e.g., scale them up so millions of people can access them, so they work faster for real-time transactions). ML engineers often have a CS degree and ML training (e.g., our ML emphasis students or CS students who have a master's degree that focuses on ML). The BS in AI Science degree is designed for students to be ready for being an ML engineer, a data scientist, a data engineer, an AI engineer, or an AI scientist job (there are always new titles, but the differences are important). AI Science grads learn about data science, machine learning (including deep learning, NLP/LLMs, etc) so you don't just throw data at ML and celebrate when your model has high accuracy; we also want you to be able to apply ML to real-world applications and be critical of the results your model

produces. The ML in Production class is really one that sets the degree apart because it is something that businesses really want graduates to know.

**Q: I'm still in high school. What can I do now to prepare for the AI Science degree?**

**A:** If your high school offers programming/CS courses (and most in Idaho do), take them! In many cases, you can take them for AP/dual enrollment credit. Just as important is math: try to get as far as you can in math classes, AP/dual credit if possible. Calculus is a prerequisite for CS 121, so having it done will really help. The 4-year plan for the AI Science degree assumes that you still need to take calculus and that you haven't taken any programming courses before, so don't feel like you are behind. But, if you're able, get as much math done as you can.

**Q. The CS Degree is accredited by ABET. Is the new AI Science degree also accredited?**

**A:** Not yet. There are two big reasons for that: (1) ABET doesn't have any accreditation standards for AI degrees since they are so new, and (2) a degree program can't apply for accreditation until there are graduates. We will be accredited as soon as we are able. There is considerable overlap with CS courses, which are accredited.

**Q. Should I double-major in CS and AI Science?**

**A:** Double-majoring is a good option if you really want to market yourself as a software engineer and/or AI scientist or ML engineer. It would take an additional 2-4 semesters to complete both degrees, but it is possible.

**Q. Is the degree offered online?**

**A:** Some of the courses are online depending on the semester and instructor, but for the most part the degree program is in person. We are slowly moving more courses towards an online delivery.