### ARTIFICIAL INTELLIGENCE - GRADUATE CERTIFICATE (ONLINE)

The graduate certificate in Artificial Intelligence (AI) provides students a strong foundation in key AI topics. Students apply Machine Learning (ML) algorithms to real-world data sets; examine ethical issues in the design and implementation of current and future computing systems and technologies; create an appreciation for the tight interplay between mechanism, sensor and control in the design of robotic and intelligent systems; and study vital topics in generative AI reinforcement learning, natural language processing and autonomous systems.

### Program Policies

This specialized program does not align with standard campus policies. Please refer to the Special Online Programs (https://catalog.colorado.edu/specialized-programs/) section of the catalog for more information.

### Requirements

The AI graduate certificate requires 12 credit hours of coursework. To earn the certificate, students must complete 4 full specializations from the following courses with a grade of C or higher in each course and a 3.0 cumulative GPA. Each course in a specialization is 1 credit.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>CSCA 5214</td>
<td>Computing, Ethics, and Society Foundations</td>
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<tr>
<td>CSCA 5224</td>
<td>Ethical Issues in AI and Professional Ethics</td>
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<td>CSCA 5234</td>
<td>Ethical Issues in Computing Applications</td>
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<tr>
<td>CSCA 5832</td>
<td>Fundamentals of Natural Language Processing</td>
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<td>CSCA 5842</td>
<td>Deep Learning for Natural Language Processing</td>
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<tr>
<td>CSCA 5852</td>
<td>Model and Error Analysis for Natural Language Processing</td>
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#### Specializations

Choose four specializations from the list below: 12

- Computing, Ethics and Society
- Natural Language Processing: Deep Learning Meets Linguistics
- Artificial Intelligence
- Reinforcement Learning
- Foundations of Autonomous Systems
- Introduction to Robotics with Webots

### Learning Outcomes

- Students will gain a deep knowledge of AI, machine learning theory and its numerous applications including (but not limited to) natural language processing, computer vision, robotics, healthcare and human-centered computing.
- Students will be able to design and implement comprehensive solutions for practical problems that incorporate the latest AI techniques.
- Students will be able to identify the ethical implications in the design and application of AI technology and contribute to the emerging discussion in these areas as ethical developers of new technologies.
- Students will understand CS foundations, probability/statistics, programming languages and computer systems. Specifically, their knowledge will extend to how ideas from these sub-disciplines of CS support AI systems and vice-versa.
- Students will keep up with the state-of-the-art methods and techniques in this rapidly changing discipline of AI. Students will read and comprehend research papers and consider how the ideas in them can be applied in their everyday practice.