

# ARTIFICIAL INTELLIGENCE AND COMPUTATIONAL DRUG DISCOVERY AND DEVELOPMENT (MS)

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**Degree Offered:** MS

**Program Leadership:**

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**Admissions Inquiries:**

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## Program Description

The Artificial Intelligence and Computational Drug Discovery and Development (AICD3) Graduate Program is a 1.5 years (5 quarters) program leading to a MS in Artificial Intelligence and Computational Drug Discovery and Development. Students will complete 38 units of didactic courses in the first three quarters, then complete a capstone project in the following two quarters (20 weeks)

The program will train students to apply computer science, data science, statistical analysis, machine learning, and other data-driven methods to bolster the discovery and development of new drugs and therapies. The program intends to give students the competitive edge for the most desirable jobs in the biopharmaceutical industry and in academia, both of which increasingly require interdisciplinary training

The curriculum is carefully designed to ensure mastery in computational approaches spanning systems pharmacology, bioinformatics, physiologic-based pharmacokinetic/pharmacodynamic modeling, and pharmacogenomics, that will pave the way to transformational changes and innovation of drug discovery (e.g., identification of novel targets) and drug development (e.g., virtual human trials). Didactic courses will provide students with in-depth foundational computer science knowledge and advanced computational skills, and cover the latest technological advancements while emphasizing the ethical implications and societal impacts of AI in healthcare.

The Capstone Project is required for graduation from the AI-CD3 program. It is designed and structured to allow students to gain experience applying learned tools and methodologies to drug discovery and drug development projects in an academic or industry setting. These projects provide experiential training in which students will use the computational skills and tools that they gained in their didactic curriculum in an applied project in either the industry or academia. Additionally, the Capstone Project will allow students to deeply explore fields of interest and collaborate with scientists from many disciplines. It concludes with the submission and presentation (poster and oral) of the project.

## Admission Requirements

### Basic qualifications:

Prospective students must possess a bachelor's degree from an accredited institution by the time classes commence.

### Preferred degree backgrounds:

Applicants with degrees in the following fields are encouraged to apply:

- biology, chemistry, biochemistry
- computer science, computer engineering, electrical engineering
- statistics, data science
- mathematics

These degrees should demonstrate the applicant's capability for success in technical studies

### Consideration for non-technical degrees:

Candidates with degrees outside the mentioned technical fields may still be considered if:

- They've undertaken significant relevant coursework.
- The admissions committee assesses them as adequately prepared for graduate studies.

### Additional prerequisites:

- Minimum GPA: 3.0 out of 4.0.
- Essential courses: calculus, and at least one from the following: biology, chemistry, physiology, or biochemistry.

## Learning Outcomes

The program's learning outcomes revolve around mastering the essential skills and knowledge in AI and computational techniques for drug discovery and development. This includes proficiency in data analysis, understanding of drug design processes, ethical considerations in AI, and the ability to translate theoretical knowledge into practical solutions for real-world challenges.

## Degree Requirements

FORTHCOMING

## Core Courses

FORTHCOMING