ARTIFICIAL INTELLIGENCE AND COMPUTATIONAL DRUG DISCOVERY AND DEVELOPMENT (AICOMPDRUG)

AICOMPDRUG 201 Techniques in Drug Discovery (3 Units) Fall

Instructor(s): Brian Shoichet
Prerequisite(s): None.

Restrictions: This course is limited to students in the AICD3 Program and other PhD programs at UCSF.

Activities: Lecture

The course introduces widely used techniques in drug discovery. Students will engage with the social, economic, and structural elements that underpin the pharmaceutical industry and delve into the various phases and methodologies involved in drug development. The course is structured to progressively build understanding from foundational concepts to advanced techniques, with each week dedicated to specific themes.

School: Pharmacy
Department: Bioengineering And Therapeutic Sciences
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: No
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

AICOMPDRUG 202 PK/PD Principles (2 Units) Fall

Instructor(s): Joanne Chun
Prerequisite(s): None.

Restrictions: This course is limited to first year students in the AICD3 Program.

Activities: Lecture

This course is focused on introducing students to the basic principles of pharmacokinetics and pharmacodynamics. Foundational knowledge and concepts in absorption, distribution, metabolism, and excretion, dose-response relationship, and pharmacogenomics will be covered in a series of lecture-based classes. This class provides the building block knowledge to another computational pharmacokinetics/ pharmacodynamics modeling class in the subsequent quarter.

School: Pharmacy
Department: Bioengineering And Therapeutic Sciences
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: No
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

AICOMPDRUG 203 Fundamentals of Machine Learning (5 Units) Fall

Instructor(s): Shenghuan Sun
Prerequisite(s): None.

Restrictions: This course is limited to first year students in the AICD3 Program.

Activities: Lecture, Seminar, Workshop

This course provides a comprehensive overview of computer programming fundamentals. It covers the essentials of programming languages and AI/ML tools pertinent to pharmaceutical sciences. Students will develop a foundational understanding of computational techniques. The course includes project-based assignments designed to simulate real-world drug discovery scenarios, offering practical experience with the computational methods and AI/ML tools explored throughout the course.

School: Pharmacy
Department: Bioengineering And Therapeutic Sciences
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: No
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

AICOMPDRUG 204 Computation and AI in Drug Discovery and Development (3 Units) Winter

Instructor(s): Joanne Chun
Prerequisite(s): None.

Restrictions: This course is limited to first year students in the AICD3 Program.

Activities: Lecture

This course provides examples of the application of computation and artificial intelligence (AI) at various stages in drug discovery and development. Key aspects of the course include a stepwise progression through this process with case examples covering drug discovery powered by AI and machine learning (ML) in target identification and drug design, model-informed drug development, applications of AI in disease modeling and precision medicine.

School: Pharmacy
Department: Bioengineering And Therapeutic Sciences
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: No
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

AICOMPDRUG 205 Modeling for Drug Development (4 Units) Winter

Instructor(s): Rada Savic
Prerequisite(s): This course is limited to first year students in the AICD3 Program.

Restrictions: None.

Activities: Lecture, Project, Workshop

Students will delve deeply into the principles of population PK-PD modeling, with an emphasis on how these models can be leveraged to improve successes at every stage of drug development. Additionally, the course will explore how PK-PD models assist clinicians in optimizing drug treatment strategies. The integration of AI with traditional PK-PD methods will also be introduced, highlighting its potential to further enhance model-informed drug development.

School: Pharmacy
Department: Bioengineering And Therapeutic Sciences
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Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: No
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

AICOMPDRUG 223A AI and ML for Capstone Innovation (3 Units) Fall

Instructor(s): Michael Motion
Prerequisite(s): None.

Restrictions: This course is limited to first year students in the AICD3 Program.

Activities: Lecture, Project, Discussion

This course offers students an immersive experience in the latest technological advancements, particularly in AI and machine learning, through literature reviews, guest lectures from industry leaders, and interactive discussions. Another significant focus is placed on providing students with a comprehensive overview of the various topics and areas of interest available for their capstone projects.

School: Pharmacy
Department: Bioengineering And Therapeutic Sciences
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: No
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No

AICOMPDRUG 223B Practical Modules of AI and ML for the Biotech Industry (3 Units) Winter

Instructor(s): Michael Motion
Prerequisite(s): None.

Restrictions: This course is limited to first-year students in the AICD3 Program.

Activities: Lecture, Project, Discussion

This course offers students an immersive experience in the latest technological advancements, particularly in AI and machine learning, through literature reviews, guest lectures from industry leaders, and interactive discussions. Another significant focus is placed on providing students with a comprehensive overview of the various topics and areas of interest available for their capstone projects.

School: Pharmacy
Department: Bioengineering And Therapeutic Sciences
May the student choose the instructor for this course? No
Does enrollment in this course require instructor approval? No
Course Grading Convention: Letter Grade
Graduate Division course: No
Is this a web-based online course? No
Is this an Interprofessional Education (IPE) course? No
May students in the Graduate Division (i.e. pursuing Master or PhD) enroll in this course? Yes
Repeat course for credit? No