

**PHA 6935**  
**New Approaches in Drug Discovery (1 Credit Hour)**

Spring 2023

**Instructor:**

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Class Time: Tuesdays, 4-6 pm. Most of the lectures will be 1-hour in length and start at 4 pm. Any changes to class times and dates will be communicated in advance.

Classroom: BG006, Basic Science Building

**Course Description:**

The course provides an overview of some of the new approaches and technologies used in drug discovery. The course will combine pre-lecture readings and in-class discussions. After an introduction to the principles, real world examples will be discussed. The course is designed to prepare students to become future “drug hunters” through building a strong foundation of scientific knowledge and understanding of modern drug discovery. This is a one credit course and students should expect to put in 6-8 hours of work per week.

**Prerequisites:** Graduate student status, Drug Design I (PHA6447)

**Required Text:** Reading material will be assigned every week

**Course Objectives:**

- 1) To provide the general knowledge and practice of the recent advances in drug discovery.
- 2) To understand various new techniques and approaches in drug discovery.
- 3) To improve life-long learning and problem-solving abilities critical to becoming a PhD-level “drug hunter”.

**Student Evaluations:** Students will be graded on independent study and homework assignments, in-class discussion, a final essay, and an oral presentation.

|   |              |
|---|--------------|
| Independent Study and Homework Assignments: | 40% of grade |
| In-Class Discussion:                        | 20% of grade |
| Final Essay and Presentation:               | 40% of grade |

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Total Grade: 100%

Course letter grades will be assigned according to the following percentage scale: 100-91.5% (A), 91.4-89.5% (A-), 89.4-87.5 (B+), 87.4-81.5% (B), 81.4-79.5 (B-), 79.4-69.5 (C), 69.4-59.5 (D), <59.4 (E).

**Assignments:**

Reading assignment will be distributed through email 1-2 weeks before each new topic.

Take-home problems may be assigned after each lecture.

Essay and Presentation: A recently FDA approved small molecule drug will be assigned to each student. The essay can include background, target biology, mechanism of action, hit discovery, SAR, pharmaceutical

properties, synthesis, in vitro/in vivo assays, clinical studies, and your comments/thoughts. In addition, the student will prepare a PowerPoint presentation based on the essay. References and supporting material found therein should be reviewed in order to present a complete story. Students will present for 25-30 min followed by a 10 min Q&A discussion. Essay due date---to be determined; Presentations: last week of the semester.

**Attendance:**

Students are required to be diligent in their studies and regular in their attendance at classes. They will be held responsible for making satisfactory arrangements with the course coordinator regarding absences.

**Lecture Schedule:**

| Lecture | Date | Topic  |
|---------|------|--|
| 1       | 1/10 | Introduction and Drug Discovery Process Overview         |
| 2       | 1/17 | Over of Therapeutic Modalities                           |
| 3       | 1/24 | Target/Off-Target Identification and Validation          |
| 4       | 1/31 | Target/Off-Target Identification and Validation          |
| 5       | 2/7  | Hit and Lead Discovery Approaches                        |
| 6       | 2/14 | Hit and Lead Discovery Approaches                        |
| 7       | 2/21 | “Magic” Functional Groups and Atoms in Drug Discovery    |
| 8       | 2/28 | “Magic” Functional Groups and Atoms in Drug Discovery    |
| 9       | 3/7  | Covalent Drug Design and Discovery                       |
| 10      | 3/14 | Covalent Drug Design and Discovery                       |
| 11      | 3/21 | Novel Prodrug Approaches and Tissue Targeting Techniques |
| 12      | 3/28 | Induced Proximity in Drug Discovery                      |
| 13      | 4/4  | Induced Proximity in Drug Discovery                      |
| 14      | 4/11 | Induced Proximity in Drug Discovery                      |
| 15      | 4/18 | Other Emerging Modes-of-Action in Drug Discovery         |
|         | 4/25 | Presentations  |

This course syllabus is a general plan for the course. The course instructor may make modifications and exceptions to this syllabus at his discretion at any time during the semester; any changes will be announced during regularly scheduled lecture periods.