Medicinal Chemistry PHM W382R
(co-listed as PGS w396M)
Modern Trends in Drug Design and Discovery
Summer-2020

Course Coordinator:  Dr. Chris Whitman, Ph.D.

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Office Hours:  TBA

Course Unique Number: PHM W382R is #87023 and PGS w396M is #86795.

Classroom:  Online via Zoom

Class Days/Times:  3-5 pm (MW).

Course Faculty:  Dr. Chris Whitman, Ph.D. (whitman@austin.utexas.edu)
Dr. Kevin Dalby, Ph.D. (dalby@austin.utexas.edu)
Dr. Patrick Davis, Ph.D. (davispj@austin.utexas.edu)
Dr. Walt Fast, Ph.D. (walt.fast@austin.utexas.edu)
Dr. Seongmin Lee, Ph.D. (seongminlee@austin.utexas.edu)
Dr. Hung-wen Liu, Ph.D. (h.w.liu@austin.utexas.edu)
Dr. Kun Yang, Ph.D. (Kun.Yang@austin.utexas.edu)

Office Hours:  Upon Request
Course Information

Course Description:
The course provides the student with an understanding of drug metabolism, pharmacogenomics, mechanisms of drug action, and approaches used in modern drug discovery and development (e.g., reversible and irreversible enzyme inhibition, biosynthesis of medically relevant natural products, and DNA interactive agents).

Course Prerequisites/Co-Requisites:
Requires good standing in the graduate/PharmD program or permission of Dr. Whitman.

Course Objectives:

1) Provide student with broader understanding of drug metabolism, including Phase 1 & Phase II routes of metabolism and factors that affect drug metabolism (physiological, induction, inhibition).
2) Provide insight into basic pharmacogenomics
3) Examine the drug development process as it specifically relates to different targets (enzymes, proteins, DNA)
4) Provide students with basic understanding of various strategies to inhibit an enzyme
5) Provide insight into biosynthesis of natural products and mechanisms of action
6) Provide insight into drugs and natural products that interact with DNA and DNA Repair enzymes.
7) Provide an understanding of the roles for protein kinases and ubiquitination and their potentials as drug targets

Course Learning Objectives (CAPE Objectives):
The primary CAPE Outcomes addressed in this course are from Domain 1 – “Foundational Knowledge”; Subdomain 1.1 (“Learner”) represented by the following Learning Objectives:
1.1.1 Develop and demonstrate depth and breadth of knowledge in pharmaceutical, social/behavioral/administrative, and clinical sciences.
1.1.2 Articulate how knowledge and discovery in foundational sciences is integral to clinical reasoning; evaluation of future advances in medicine; supporting health and wellness initiatives; and delivery of contemporary pharmacy services.
1.1.3 Integrate knowledge from foundational sciences to explain how specific drugs or drug classes, drug products, and dosage forms work and evaluate their potential value in individuals and populations.
1.1.4 Apply knowledge in foundational sciences to solve therapeutic problems and advance patient-centered care.

Course Success:
It is expected that students attend class via Zoom, actively participate in discussion on Zoom, and take notes. Reviewing notes (before each class), reading, understanding, and doing any assignment will reinforce concepts discussed in class. In some assignments, students will be paired up so they must be present to do the work.

Course Website:
This course uses Canvas, a Web-based course management system in which a password-protected site is created for each course. Canvas will be used to distribute course materials, to communicate, and to post grades. Canvas is available at http://canvas.utexas.edu. Support is provided by the ITS Help Desk at 475-9400 Monday through Friday 8 am to 6 pm.
Course Communications:
Official course communications will take place in class, through e-mail and on the course Canvas website. Students are advised to configure their Canvas settings to forward course announcements to their official e-mail address. Canvas uses only the e-mail address listed on the official University of Texas directory, so please check the University’s online directory to ensure your e-mail address is listed correctly.

Course Video Recordings:
Unless otherwise notified, synchronous Zoom meetings scheduled in Canvas and accessible through Canvas will be used to deliver lectures in this course, and will be available as cloud recordings after the class on Canvas. Any distribution of College- or student-generated recordings (regardless of format) is prohibited without the written and signed permission of the presenter and students identifiable on the recording. Likewise, all course materials developed by the faculty member (handouts, PowerPoints, etc.) are the intellectual property of that faculty member and cannot be distributed further without the permission of that faculty member.

Viewing video-streamed recordings of lectures can be streamed using a DSL broadband connection. Your faculty are not in a position to troubleshoot your video-streaming problems, so please do not ask them to do so; rather, you should access the LRC’s help website at https://www.utexas.edu/pharmacy/help/ to address those problems. You will find additional information about the lecture capture system or can report technical issues at http://sites.utexas.edu/phr-lrc/
Course Policies

Course Grading Policies:
The final grade is based on the average of 3 equally weighted, graded assignments (e.g., paper presentation, paper, and/or short answer). The format and delivery of the assignment is up to the individual faculty member. There is no cumulative final. Exams will be scheduled as indicated below in the Course schedule.

Course Grading:
A Range: A = 100%-93%  A- = 92%-90%
B Range:  B+ = 89%-87%  B = 86%-83%  B- = 82%-80%
C Range:  C+ = 79%-77%  C = 76%-73%  C- = 72%-70%
D Range:  D+ = 69%-67%  D = 66%-65%
F = Below 65%

This scale may be curved more leniently in the final analysis of grades at the discretion of Dr. Whitman.

Attendance:
Class Attendance: You are strongly encouraged to participate in the Zoom meetings in order to optimize your learning. Everyone wants to see your smiling faces!!! If you miss a Zoom meeting, you are still accountable for the subject matter presented as well as all announcements.

Excused Absences: The only absences that will be considered excused are for religious holy days or extenuating circumstances due to an emergency. If you miss class, you will still be responsible for any work you will miss on that day (if applicable).

Attendance at Professional Meetings:
It is the student’s responsibility to ASK permission IN ADVANCE if they plan to attend a professional meeting that would necessitate missing an exam, assignment, or other required course activity. It is at the discretion of Dr. Whitman as to whether to grant permission and allow the student to make up any missed work.

Required Materials:
There is not a required textbook for this class. The individual faculty members will announce any required materials/readings in class on Zoom.

Recommended Materials:
The recommended materials and/or reading assignments will be announced in class on Zoom.

Classroom Expectations:
Cell Phones: Cell phones must be put away during class. You can catch up with texts and email during the break.
Laptops: Laptop computer use during class is strictly limited to viewing the Zoom lecture and taking notes.
Appearance: Remember that you’re on camera!!! Everyone can see what you’re wearing and your background. Please be professional, tasteful, and discreet.
Exam Policies

Exam Format:
The final grade is based on the average of 3 equally weighted, graded assignments. The nature of these assignments is up to the individual faculty member and can include a paper presentation, short paper on an assigned topic or literature article, essay exam on Canvas, take-home exam, and so on.

Exam Grading:
Grading of Exams/Assignments will be done by the individual faculty.

Exam Return:
Assignments will be returned, but you might have to prompt the faculty member (or send an email to Dr. Whitman).

Exam Review and Exam Reconsideration Requests:
Students will have the opportunity to review the graded assignments. Please discuss any reconsideration of the grade with the individual faculty member within 1 week of receipt of the graded assignments.

Final Exam Re-Examination Policy:
There is no final exam.

Request for an Alternate Exam Time:
No allowances will be made for an exam being missed, other than documented illness or emergency, or by prior approval by Dr. Whitman. An unexcused absence from an exam may result in a grade of "zero" for that exam. Any student requesting accommodation for an upcoming exam must submit the request to Dr. Whitman using the online form posted on Canvas® at least one month prior to the exam. The form can be found at the following link: https://utexas.qualtrics.com/jfe/form/SV_bfGs9VUDgOYwoXH.

Note the new policy that an alternate exam time will be considered only if the student documents that they can’t be physically present on the date the exam is already scheduled.

Academic Integrity:
Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. See College Policies and Information, and University Policies and Information for more details.

Religious Holy Days
If you will miss a class, an examination, a work assignment or a project in order to observe a religious holy day, you must notify Dr. Whitman the first week of class so that arrangements for all such students can be made for the full semester.

Services for Students with Disabilities:
Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities at 471-6259 (voice) or 232-2937 (video phone) or https://diversity.utexas.edu/disability/. All University rules concerning accommodations must be followed, including the student arranging for special accommodations prior to each examination. In the absence of such prearrangement, it will be assumed that the student is not requesting special accommodations for that exam, and will be expected to take the exam with the rest of the class at the regularly scheduled exam time.
Please provide a copy of the letter to the course coordinator and the office of the Associate Dean for Academic Affairs as soon as possible after receipt.
The Topics and Schedule are approximate

Dr. Davis:
June 8       Introduction to Drug Metabolism (implications/Phase 1)
June 10      Phase 1 and Phase 2
June 15      Factors Affecting Metabolism
June 17      Pharmacogenomics

Dr. Whitman:
June 22      Enzyme Mechanisms: Strategies/opportunities for Inhibition I
June 24      Enzyme Mechanisms: Strategies/opportunities for Inhibition II

Exam #1: Davis/Whitman – Week of June 29

Dr. Fast:
July 6       Covalent Enzyme Inhibitors
July 8       Fragment based Drug Design

Dr. Liu:
July 13      Biosynthetic Pathways for Natural Products used as Drugs -I
July 15      Biosynthetic Pathways for Natural Products used as Drugs -II

Exam #2: Fast/Liu – Week of July 20

Dr. Lee:
July 27      DNA Alkylating Agents/Antitumor Antibiotics/Anticancer Antimetabolites
July 29      Epigenetic Chemotherapeutics/Hormonal Antineoplastics

Dr. Dalby:
August 3     Protein Kinases and Cancer
August 5  Targeted Cancer Therapeutics

Dr. Yang:

August 10  Ubiquitination and Drug Discovery
August 12  DNA Repair Inhibitors

Exam #3: Lee/Dalby/Yang - August 17