Basic Principles of Medicinal Chemistry
PHM 180K (Unique #57420)
-and-
Basic Principles of Medicinal Chemistry Lab
PHM 180P (Unique #57425; #57430)
Fall-2019

Faculty:  
Dr. Patrick Davis, Ph.D. (Med Chem), PHR 180K Course Coordinator
davispj@austin.utexas.edu, BME 6.202C, 512-475-9751, office hrs online  
(Sunday evenings) or arranged via email.

Dr. Walter Fast, Ph.D. (Med Chem), PHR 180P Course Coordinator
walt.fast@austin.utexas.edu, BME 6.202D, 512-232-4000, office hrs  
arranged by email

Schedule:  
Lectures, Mon, 11am-12pm in PHR 2.110  
Lectures & Pre-Lab, Thurs, 11am-12pm in PHR 2.110  
Laboratory  
Mon 2-5 p.m. in PHR 4.212  
Wed 2-5 p.m. in PHR 4.212  
Please note: No food or drink in this newly refurbished room  
Optional AA-led review Sessions will be announced

Teaching Assts:  

Academic Assistant:  
TBD
Course Information

Course Description:
Lecture: Introduction to medicinal chemistry principles. Subjects include drug metabolism and the transition from organic to medicinal chemistry. Lab: Laboratory exercises to support the basic pharmaceutical sciences courses

Course Prerequisites/Co-Requisites:
PHM 180K and 180P are co-requisites

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:
Attendance and active participation in class discussions will provide students with the opportunity to seek clarification and readily apply the material. The lab is designed to reinforce lecture content. Students should see clarification on issues that arise during the semester rather than just prior to exams.

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:
A video capture system will be used in this course. The video streams are offered as a supplement to lecture attendance, not as a substitute. Therefore, if technical problems preclude recording the lecture, the lecture will not be re-recorded, but students are still responsible for
the content of the lecture. Lecture recordings will be available to you for the balance of the semester unless otherwise specified. Do not expect to have access after the semester is over.

Faculty and students utilizing class video recordings should be careful to not compromise the privacy of either themselves or other users (http://registrar.utexas.edu/students/records/ferpa), or the rights of the presenter. Students are free to make their own recordings of lectures unless specifically prohibited from doing so by the presenter. Any additional 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 on campus or can be viewed off-campus 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

There will be two 3-hr summary examinations throughout the semester, plus a comprehensive final administered during the Final Exam period. Summary Exams will cover both the lecture and the laboratory material, since the material is coordinated for reinforcement. Most exams will be administered using ExamSoft®, and will be given according to the schedule below:

<table>
<thead>
<tr>
<th>Exam Date &amp; Time</th>
<th>Location</th>
<th>Coverage</th>
<th>Faculty</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thurs Oct 7th, 7-9 pm</td>
<td>PHR 2.108/2.110</td>
<td>Lec: Princ Med Chem</td>
<td>Fast [5 lectures]</td>
<td>100 pts</td>
</tr>
<tr>
<td>Thurs Oct 7th, 7-9 pm</td>
<td></td>
<td>Labs: 1-4</td>
<td>Fast</td>
<td>80 pts</td>
</tr>
<tr>
<td>Tues Dec 3rd, 2:30-5</td>
<td>PHR 3.106</td>
<td>Lec: Metabolism</td>
<td>Davis [10 lectures]</td>
<td>140 pts</td>
</tr>
<tr>
<td>Tues Dec 3rd, 2:30-5</td>
<td></td>
<td>Lab: 5-11</td>
<td>Davis, Fast</td>
<td>140 pts</td>
</tr>
<tr>
<td>Final Exam*</td>
<td>TBA</td>
<td>Lec: Med Chem Prin Lec: Metabolism No Labs on Final</td>
<td>Fast Davis</td>
<td>100 pts</td>
</tr>
</tbody>
</table>

Course grades are thus based on the following:

**180K:** 340 pts (based solely on examinations)

**180P:** 330 pts (based on 220 exam pts and 110 pts from ~11 lab assignments. Please address unavoidable absences ahead of time with the TA assigned to your lab section to schedule alternative days. [Note: Total possible points may be lower if a lab is canceled due to school closure, or if selected reports not assigned].

Lab worksheets will be due at the end of each lab session and will mostly take the form of short answer questions, although other formats will also be used. Although most lab exercises will be small
group experiences, the lab report should be your own individual work, unless specifically instructed otherwise.

**Course Grading 180K:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100%-93%</td>
<td>A-</td>
<td>92%-90%</td>
</tr>
<tr>
<td>B</td>
<td>89%-87%</td>
<td>B-</td>
<td>82%-80%</td>
</tr>
<tr>
<td>C</td>
<td>79%-77%</td>
<td>C-</td>
<td>72%-70%</td>
</tr>
<tr>
<td>D</td>
<td>69%-67%</td>
<td>D-</td>
<td>Below 65%</td>
</tr>
</tbody>
</table>

**Course Grading 180P:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100%-90%</td>
</tr>
<tr>
<td>B</td>
<td>89%-80%</td>
</tr>
<tr>
<td>C</td>
<td>79%-70%</td>
</tr>
<tr>
<td>D</td>
<td>69%-65%</td>
</tr>
<tr>
<td>F</td>
<td>Below 65%</td>
</tr>
</tbody>
</table>

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

**Attendance:**

**Class Attendance:** You are encouraged to attend class in order to optimize your learning. If students miss class, they are still accountable for the subject matter presented as well as all announcements.

**Lab Attendance:** Lab attendance is mandatory. If you cannot attend your scheduled lab session for a particular week, contact Dr. Fast to see if the second lab section can accommodate you.

**Excused Absences:** The only absences that will be considered excused are for religious holy days or extenuating circumstances due to an emergency. If you plan to miss class due to observance of a religious holiday, please let the course coordinator know at least two weeks in advance, preferably at the beginning of the semester. You will not be penalized for this absence, although you will still be responsible for any work you will miss on that day if applicable. Check with the course coordinator for details or arrangements.

**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 the course coordinator as to whether to grant permission and allow the student to make up any missed work.

**Required Materials:**

- The molecular viewing software, UCSF Chimera, used in the lab portion of the course must be downloaded before its use in the Lab portion of the course, and is available from the following site for Windows, Mac, or Linux platforms at no cost for noncommercial use: [https://www.cgl.ucsf.edu/chimera/](https://www.cgl.ucsf.edu/chimera/) You will have to bring your laptop computer with this software installed to most of Dr. Fast’s and Dr. Davis’ lab sessions

**Recommended Materials:**

- Foye’s *Principles of Medicinal Chemistry*, 8th Ed., 2019 [a copy is available in the LRC]
Classroom Expectations:
Cell phones must be put away during class. Laptop computer use during class is strictly limited to viewing lecture handouts and taking notes.

Dress Code for Lab: There is no dress code for lab.

**Exam Policies**

**ExamSoft®:**
Students are responsible for the maintenance of their approved personal devices and Examplify® software. Students are required to bring approved personal devices and privacy screens for all exam and indicated assignments. Lack of preparation may result in an inability to take the exam, adjustments to course grades at the discretion of course coordinators, and/or an unprofessional conduct referral.

Any problems with Examplify® or ExamSoft® should be addressed via phone to Student Tech Support at 866.429.8889, email to support@examsoft.com, or live chat at www.examsoft.com. Do not expect your faculty to troubleshoot your technology issues.

Students found improperly using ExamSoft® or Examplify® to gain unfair academic advantage are violating the College of Pharmacy Honor Code. Violations such as “academic dishonesty” and/or “professional misconduct” would include, but are not limited to using a classmate’s login/password, tampering with exam files, and falsifying upload or download information, or any attempt to circumvent the security features of the software.

Students should refer to the ExamSoft® Policies Handbook for a complete listing of policies related to exams, quizzes and assignments.

**Exam Format:**
Exam questions may include: multiple choice, true/false, fill-in-the-blank, matching and/or short answer. The format for the exam is entirely the prerogative of the faculty. Students must arrive on time for examinations. All instructions and corrections will be made at the beginning of the examination period and will not be repeated. Semester exams will begin promptly at the designated hour and will be concluded (in ExamSoft®) at exactly 3 hrs. The final examination (lecture material only) will last three hours. Students arriving after any students have completed the exam and left the room may not be allowed to sit for the exam and may receive a score of zero.

**Exam Grading:**
Grading of exams, along with statistical analysis and review of exam questions, will be the responsibility of the course coordinator and faculty, who may choose to grant credit for statistically poor questions.

**Exam Return:**
ExamSoft® examinations will not be returned. Exam scores will be posted on the course Canvas site.
Exam Review / Release of Exams:
An exam review will be conducted in the immediate week following each exam (Tuesdays; PHR 3.106, 9-10AM). Attendance is optional unless a student scores <70% on any individual exam, in which attendance is mandatory. Use of the exam autopsy is strongly encouraged to assist in identifying weaknesses. Exams will not be released back to student

Exam Reconsideration Requests:
Students will have the opportunity to review their exam results at the secure ExamSoft® review session scheduled after each test. Review sessions are optional unless the student scored <70% (in which case attendance is mandatory). If a student feels there is a justifiable discrepancy between their answer and the keyed answer, they can submit a formal reconsideration request on the form provided at the review session. Students must turn in their reconsideration request form(s) and show the proctor that they have logged out of Examplify® before they leave the review session. There are no reconsiderations on the Final Exam.

Exam Review Prior to Final Exam:
Exams from earlier in the semester will not be available for review prior to the Final exam. Instead, students should attend the review sessions for the individual exams during the semester.

Final Exam Re-Examination Policy:
There is no final exam reconsideration requests or re-examinations allowed for this course.

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 the Course Coordinator. 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 the course coordinator using the online form posted on Canvas® at least one month prior to the exam.

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 [Pharmacy Council Executive Committee Recommendation, 12/13/17].

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 the course coordinator 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.
**Schedule of Basic Principles Medicinal Chemistry (PHR 180K) -and- Basic Principles of Medicinal Chemistry Lab (PHR 180P).**

Note: Revised 8/2019

<table>
<thead>
<tr>
<th>Week</th>
<th>Inclusive Dates</th>
<th>Lab Scheduled</th>
<th>Mon Lecture Topic</th>
<th>Fri Lecture / Pre-lab Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 28-30</td>
<td>No Lab (partial week)</td>
<td>F 8/30: Fast (Introduction to Med Chem)</td>
<td></td>
</tr>
</tbody>
</table>
| 2    | Sept 2-6       | No Lab (Labor Day Week) | M 9/2: Labor Day – no class  
F 9/6: Fast (Functional Groups in Drugs) (Lab 1: Reactivity) |
| 3    | Sept 9-13      | Lab 1: Reactivity | M 9/9: Fast (Hydrophobicity in Drugs)  
F 9/13: Fast (Lab 2: pKₐ & Partition Coefficient) |
| 4    | Sept 16-20     | Lab 2: Partition Coefficient | M 9/16: Fast (Drug:Protein Binding)  
F 9/20: Fast (Lab 3: pKₐ & Drug Chirality) |
F 9/27: Fast (Lab 4: AAs & 2° structure) |
| 6    | Sept 30-Oct 4  | Lab 4: AAs & 2° Structure | M 9/30: Davis (Drug Metabolism-Foundation)  
F 10/4: Fast (Lab 5: Domains & Hemoglobin) |
| 7    | Oct 7-11       | Lab 5: Domains & Hb | M 10/7: Davis (Drug Metabolism-Classification)  
F 10/11: Fast (Lab 6: β-Lactamases) |
| 8    | Oct 14-18      | Lab 6: β-Lactamases | M 10/14: Davis (Drug Metabolism-Phase-1 P450)  
F 10/18: Fast (Lab 7: Membrane Proteins) |
|      |                |               | Exam 1 on Mon, Oct 7th 7-9 pm covering Weeks 1-5 (Fast) and Labs 1-4 (Fast) |
| 9    | Oct 21-25      | Lab 7: Membrane Proteins | M 10/21: Davis (Drug Metabolism-Phase-1 P450)  
F 10/25: Fast (Lab 8: Biologics) |
| 10   | Oct 28-Nov 1   | Lab 8: Biologics | M 10/28: Davis (Drug Metabolism-Phase-1 Non-P450)  
F 11/1: GUEST SPEAKER: Dr. Everett Stone |
| 11   | Nov 4-8        | No Lab Scheduled | M Nov 4: Davis (Drug Metabolism-Phase-1 Non-P450/Phase-2)  
F Nov 8: Davis (Lab 9: Metabolic Pathways) |
| 12   | Nov 11-15      | Lab 9: Metabolic Pathways | M Nov 11: Davis (Factors Affecting Metabolism)  
F Nov 15: Davis (Lab 10: Liver Game during pre-lab) |
| 13   | Nov 18-22      | Lab 11: PGenomics | M Nov 18: Davis (Pharmacogenomics Concepts)  
F 22: Davis (Lab 11: Concept Mapping Lab during pre-lab and PGen Post Lab) |
| 14   | Nov 25-29      | No Labs (Thanksgiving) | M Nov 25: Davis (Pharmacogenomics Implications)  
F Nov 29: No Pre-lab Thanksgiving week |
| 15   | Dec 2-6        | No Lab Scheduled | M Dec 2: Davis (Exam Review)  
F Dec 6: No Pre-lab |
|      |                |               | Exam 2 on Wed Dec 3rd 2:30-5:00pm covering Weeks 6-15 (Davis) and Labs 5-11 (Fast/Davis) |
| 16   | Dec 9th        |               | M Dec 9: Open at this point |

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