PHA5439 Principles of Medicinal Chemistry and Pharmacology I
Fall 2019
3 Credit Hours – A-E Grading

The purpose of this course is to provide a mechanism for understanding and predicting the properties of drugs: absorption, distribution, interaction with receptors and enzymes, metabolism, and excretion. The mechanism involves identification of individual functional groups in drugs, prediction of the physicochemical/biochemical properties of those individual functional groups and prediction of how the collective individual functional groups can contribute to the properties of the drugs. As a pharmacist, these concepts are essential when developing a prioritized problem list and care plan for a patient. Future coursework will require application of concepts taught in this course as the student pharmacist learns to develop a prioritized problem list and care plan.

Teaching Partnership Leader
Margaret O. James, Ph.D.
- Email: mojames@ufl.edu
- Office: MSB, P-629
- Phone: (352) 273-7707
- Office Hours: By appointment ONLY.

See Appendix A. for Course Directory of Faculty and Staff Contact Information.

Entrustable Professional Activities
This course will prepare you to perform the following activities which the public entrusts a Pharmacist to perform:
Patient Care Provider Domain
2. Analyze information to determine the effects of medication therapy, identify medication-related problems, and prioritize health-related needs.
   ST2.7. Evaluate an existing drug therapy regimen
Course-Level Objectives

Upon completion of this course, the student will be able to:

1. Develop and integrate knowledge about principles of medicinal chemistry and pharmacology.
2. Identify the unique role and challenges for natural products in drug discovery.
3. Recognize sources of drugs that increasingly impact healthcare.
4. Determine how to discover new therapeutic targets.
5. Predict the effects of functional groups in drugs on $pK_a$, solubility, and interactions.
6. Predict interactions between functional groups in macromolecules and in ligands that are responsible for binding of ligands to receptors/enzymes based on biochemical principles.
7. Predict the effect of binding to receptors on activity versus potency.
8. Predict the following based on analysis of functional groups: a) metabolism, b) drug interactions.
10. Consider the role of genetics as a determinant of the rate of metabolism of drugs.
11. Predict efflux transport for different classes of drugs.
13. Predict degree of ionization of acids and bases from the Henderson Hasselbalch equation.
15. Select buffer composition to make and maintain pH of a solution.
16. Explain how prodrugs and soft drugs result in drug action.
17. Apply the problem solving strategy learned in the Personal and Professional development course when solving problems related to medicinal chemistry and pharmacology.

Course Pre-requisites

1. Admission to the Doctor of Pharmacy program.

Course Co-requisites

None

Course Outline

See Appendix B. Please routinely check your campus calendar and the Canvas course site for any messages about changes in the schedule including meeting dates/times, deadlines, and room changes.
Required Textbooks/Readings

   - Not available in Access Pharmacy
   - Available in Access Pharmacy

Use UF VPN to access UF Libraries Resources when off-campus. The UF HSC library staff can assist you with questions or issues related to accessing online library materials. For assistance contact your College of Pharmacy librarian or visit the HSC Library Website at this URL: http://www.library.health.ufl.edu/

Suggested Textbooks/Readings

None

Other Required Learning Resources

N/A

Materials & Supplies Fees

None

Student Evaluation & Grading

Evaluation Methods and How Grades are calculated.

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<th>Assessment Item</th>
<th>Grade Percentage</th>
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<td>Team Readiness Assurance Tests [4 @ 3.75% ea.]</td>
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<tr>
<td>Exam 2 [material from modules 4 to 6, 30%; Comprehensive, modules 1-6, 10%]</td>
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Rounding of grades:

Final grades in Canvas will be rounded to the 2nd decimal place. If the decimal is X.495 or higher, Canvas will round the grade to X.50. The above scale depicts this policy and grades are determined accordingly. Grade assignment is made using this policy and NO EXCEPTIONS will be made in situations where a student’s grade is “close.”

Educational Technology Use

The following technology below will be used during the course and the student must have the appropriate technology and software.

1. ExamSoft™ Testing Platform
2. Canvas™ Learning Management System

For technical support, navigate to Educational Technology and IT Support Contact Information at this URL: http://curriculum.pharmacy.ufl.edu/current-students/technical-help/

Pharm.D. Course Policies

The Policies in the following link apply to this course. Review the Pharm.D. Course Policies carefully, at this URL: https://curriculum.pharmacy.ufl.edu/current-students/course-policies/

Course Evaluation Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

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<tr>
<td>76.50-79.49%</td>
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<td>&lt; 59.50%</td>
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Appendix A. Course Directory

Teaching Partnership Leader/Course Director:
Margaret O. James, Ph.D.
Email: mojames@ufl.edu
Office: MSB, P-629
Phone: (352) 273-7707

Questions to Ask:
- Concerns about performance
- Guidance when there are performance problems (failing grades)
- General questions about content

Instructional Designer:
Holly Fremen
Email: holly.fremen@cop.ufl.edu
Office: HPNP 4309
Phone: 352-273-5558

Academic Coordinator:
Natalie Hasty
Email: nataliehasty@cop.ufl.edu
Office: HPNP 4312
Phone: 352-273-6002
Absence/Tardy Email: absent1pd@cop.ufl.edu
(Visit the course policy site for further instructions)

Educational Coordinators:
McKenzie Wallen
Email: mwallen@cop.ufl.edu
Office: Jacksonville Campus

Iverta Allen
Email: iallen1@cop.ufl.edu
Office: Orlando Campus

Questions to Ask:
- Issues related to course policies (absences, make up exams, missed attendance)
- Absence/tardy requests (Only the Academic Coordinator handles absence requests)
- Questions about dates, deadlines, meeting place
- Availability of handouts and other course materials
- Assignment directions
- Questions about grade entries in gradebook (missing grades, incorrect grade)
- Assistance with ExamSoft® (Distance campus students may contact the Educational Coordinator for use of Examplify and assistance during exams. The Academic Coordinator is the contact person for issues related to grading and posting of ExamSoft grades.)
Other Teaching Partnership Faculty Members:

Lina Cui, Ph.D.
Email: linacui@cop.ufl.edu
Office: MSB P5-31
Phone: TBA

Yousong Ding, Ph.D.
Email: yding@cop.ufl.edu
Office: MSB P6-27
Phone: 352-273-7742

Robert Huigens, Ph.D.
Email: rwhuigens@ufl.edu
Office: MSB P5-33
Phone: 352-273-7718

Hendrik Luesch, Ph.D.
Email: luesch@cop.ufl.edu
Office: MSB P3-12
Phone: 352-273-7738

John Markowitz, Pharm.D., BCPP
Email: jmarkowitz@cop.ufl.edu
Office: HSC PG-23
Phone: 352-273-6262

Guangrong Zheng, Ph.D.
Email: zhengg@cop.ufl.edu
Office: BG-022C
Phone: 352-294-8953
### Date [Recommended Date for Independent Study] | Mod# | Activity | Activity Title | Contact Time [hr:] | Responsibl | Syllabus Learning Objectives
--- | --- | --- | --- | --- | --- | ---
9/24/2019 | 00 | Quiz Online Graded | Course Introduction Quiz |  | Hendrik Luesch | 1-4

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<th>Responsibl</th>
<th>Syllabus Learning Objectives</th>
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| 9/25/2019 | 1.2 | Video Lecture | Watch: Natural Product-Based Drug Discovery Process and Structural Features | 1 | Hendrik Luesch | 1, 5-6, 13-15
| 9/25/2019 | 1.3 | Video Lecture | Watch: Emerging Sources in the 21st Century: Marine Natural Products | 1 | Hendrik Luesch | 1, 5-6, 13-15
| 9/26/2019 | 1.4 | Video Lecture | Watch: Drug Target Selection, Screening, and Optimization | 1 | Hendrik Luesch | 1, 5-6, 13-15

Optional/Supplemental

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<td>Guangrong Zheng</td>
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<td>Watch: Relationships of Functional Groups to Pharmacological Activity – Lecture 2.9</td>
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Quiz Self-Assessment

Module 2 - Self Assessments

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<td>Active Learning Session -- VC</td>
<td>Active Learning Session 1: Relationships of Functional Groups to Pharmacological Activity</td>
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<td>Guangrong Zheng, Robert W Hugens III</td>
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<td>10/19/2019</td>
<td>3.1</td>
<td>Video Lecture</td>
<td>Watch: Relationships of Functional Groups to Pharmacological Activity – Lecture 3.1</td>
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<td>Video Lecture</td>
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<td>10/22/2019</td>
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<td>Video Lecture</td>
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<td>Read: Chapter 2, pages 42-48 in Foye's Principles of Medicinal Chemistry (7th edition).</td>
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<td>Read: (Supplementary) The Organic Chemistry of Medicinal Agents, Chapter 1 (1.1 to 1.3), Chapter 2, Chapter 3 and Chapter 4</td>
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<td>Yousong Ding</td>
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<td>Watch: Relationships of Functional Groups to Pharmacological Activity – Lecture 3.6</td>
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<td>Yousong Ding</td>
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<td>Active Learning Session--VC</td>
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<td>6</td>
<td>Module</td>
<td>Module 5: Physicochemical and Biopharmaceutical Properties of Drug Substances: Drug Absorption</td>
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49.25