PHA5515 Principles of Medicinal Chemistry and Pharmacology II
Spring 2019
1 Credit Hour – [A-E Grading]

This course will provide a basis for the rational understanding of applied clinical pharmacology and therapeutics. This course will prepare the student to explain to practitioners and patients pharmacology concepts such as log dose response curves, population drug response curves, and receptor binding and regulation. This knowledge will also prepare students to better understand mechanism of action of new medications as they come on the market in the future.

Teaching Partnership Leaders

Joanna Peris, Ph.D.
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- Phone: 352-273-7688
- Office Hours: By appointment

Robin Moorman-Li, Pharm.D., BCACP
- Email: moorman@cop.ufl.edu
- Office: Jacksonville
- Phone: 904-244-9034
- Office Hours: By appointment

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
3. Establish patient-centered goals and create a care plan for a patient in collaboration with the patient, caregiver(s), and other health professionals that is evidence-based and cost-effective
   ST3.2. Develop a treatment plan with a patient. (including recommend therapeutic alternatives and generic substitution)

Practice Manager Domain
14. Fulfill a medication order.
   ST14.3. Determine if a medication is contraindicated for a patient.
   ST14.4. Identify and manage drug interactions.

Course-Level Objectives

Upon completion of this course, the student will be able to:
1. Define pharmacokinetics and pharmacodynamics and explain the differences between these two processes.
2. Define pharmacogenomics and explain how it can contribute to pharmacokinetic and pharmacodynamic variability in individual drug response.
3. Define the concept of rational drug use and practice evaluating examples of rational drug use.
4. Describe the processes for determining the mechanism of action of a drug.
5. Explain the difference between EC50 and Emax and the importance of these terms in evaluation of dose response curves.
6. Discuss how dose-response curves can predict molecular, cellular, physiologic and behavioral characteristics of a drug’s action.
7. Demonstrate the ability to compare dose response curves in relation to potency, slope, variability and efficacy.
8. Compare the potency and efficacy of multiple dose response curves and anticipate the differences in mechanism of actions of the given drugs.
9. Evaluate the slope differences in dose response curves and explain the importance of a steep, shallow, and normal slope curve.
10. List factors contributing to variability.
11. Describe the importance of understanding cellular and/or molecular mechanism of drug actions and the relationship between receptor occupancy and biologic action.
12. Explain the difference between ED50, TD50, and LD50.
13. Calculate the Certain Safety Factor and Therapeutic index and explain the meaning of these results in determining if a drug is safe or unsafe.
14. Describe the law of mass action and relate this to the drug’s mechanism of action.
15. Classify a drug’s activity based on intrinsic action including full agonist, partial agonist, inverse agonist, and antagonist.
16. Describe the difference between a competitive and noncompetitive antagonist.
17. Quantify the degree of receptor occupancy by a drug based on receptor affinity and drug concentration.
18. Draw correlations between drug affinity for a receptor population and drug potency for causing a specific molecular cellular, physiological or behavioral effect.
19. Use this information to help maximize therapeutic benefits and minimize undesirable side effects of a drug.
20. Demonstrate the ability to interpret dose response curves in specific given examples.
21. Describe the process of receptor regulation under conditions of under and over stimulation as well as list alternative mechanisms that contribute to drug tolerance and sensitization.
22. Describe conditions when the Law of Mass action is not followed (spare receptors, receptor cooperativity).

**Course Pre-requisites**

1. Successful completion of Block 1 and Block 2 courses.

**Course Co-requisites**

1. PHA5561: Pathophysiology & Patient Assessment II
2. PHA5132: Principles of Drug Therapy Individualization
3. PHA5162L: Professional Skills Lab II
4. PHA5022C: Personal and Professional Development II

**Course Outline**

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.

<table>
<thead>
<tr>
<th>Date and Time</th>
<th>Mod#</th>
<th>Unit Topic</th>
<th>Contact Time [hr.]a</th>
<th>Responsible</th>
<th>Syllabus Learning Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/17/2019</td>
<td>1.1</td>
<td>Watch: Introduction to Rational Drug Use</td>
<td>0.83</td>
<td>Joanna Peris</td>
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<tr>
<td>01/17/2019</td>
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<td>01/24/2019 8:30-10:25am</td>
<td>1</td>
<td>Active Learning Session 1</td>
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<td>Joanna Peris, Robin Moorman Li</td>
<td>1-4</td>
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<td>*iRAT/tRAT 1</td>
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<td>Joanna Peris, Robin Moorman Li</td>
<td>1-4</td>
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<tr>
<td></td>
<td>2</td>
<td>Module 2: DRC and Variability in Drug Response</td>
<td>Joanna Peris, Robin Moorman Li</td>
<td>5-13, plus previous objectives 1-4</td>
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<tr>
<td>01/29/2019</td>
<td>2</td>
<td>Review: Log Scales DOC</td>
<td>Joanna Peris</td>
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<tr>
<td>01/29/2019</td>
<td>2</td>
<td>Watch: Semi-Log Plot Review</td>
<td>Joanna Peris</td>
<td></td>
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<tr>
<td>Date and Time</td>
<td>Mod#</td>
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<td>Contact Time [hr.]</td>
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<td>Syllabus Learning Objectives</td>
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<td>Watch: Semi-Log Plot Review</td>
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<tr>
<td>01/29/2019</td>
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<td>Read: How to Label Semi-Log Graph Paper</td>
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<td>Active Learning Session 2 *iRAT/tRAT 2</td>
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<td>3</td>
<td>Module 3: Law of Mass Action and Intrinsic Activity</td>
<td>Joanna Peris, Robin Moorman Li</td>
<td>14-16, plus previous objectives 1-13</td>
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<td>02/05/2019</td>
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<td>Active Learning Session 3 *iRAT/tRAT 3</td>
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<td>4</td>
<td>Module 4: Receptor Binding</td>
<td>Joanna Peris, Robin Moorman Li</td>
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<td>5</td>
<td>Module 5: Receptor Regulation and Spare Receptors</td>
<td>Joanna Peris, Robin Moorman Li</td>
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<td>02/27/2019 8:30-10:30am</td>
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<td>Final Exam</td>
<td>ALL objectives</td>
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18.3hrs
Required Textbooks/Readings

   • Purchased for PHA5439

Use [UF VPN to access UF Libraries Resources](http://www.library.health.ufl.edu/)
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](http://www.library.health.ufl.edu/)

Suggested Textbooks/Readings

Suggested reading materials will be posted in the Canvas site.

Other Required Learning Resources

N/A

Materials & Supplies Fees

None
Student Evaluation & Grading

Evaluation Methods and How Grades are calculated.

[The Canvas© gradebook will be set-up using the percentages below to compute the grade.]

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<tr>
<th>Assessment Item</th>
<th>Points</th>
<th>Grade Percentage</th>
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<tbody>
<tr>
<td>iRATs [5]</td>
<td>50</td>
<td>16.67%</td>
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<tr>
<td>tRATs [5]</td>
<td>100</td>
<td>33.33%</td>
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<td>Final Exam</td>
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<td>50%</td>
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<tr>
<td>Total</td>
<td>300</td>
<td>100%</td>
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Table 1. Grading Scale

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: http://curriculum.pharmacy.ufl.edu/current-students/course-policies/
Appendix A. Course Directory

Teaching Partnership Leader/Course Directors:

Joanna Peris, Ph.D.
Email: peris@cop.ufl.edu
Office: P1-29/GNV
Phone: 352-273-7688
Office Hours: By appointment

Robin Moorman-Li, Pharm.D., BCACP
Email: moorman@cop.ufl.edu
Office: JAX
Phone: 904-244-9590
Office Hours: By appointment

Questions to Ask:

- Questions about grades and concerns about performance
- Guidance when there are performance problems (failing grades)
- General questions about content

Instructional Designer:

Sarah A. Burgess, M.Ed.
Email: sburgess@cop.ufl.edu
Office: HNP 4309
Phone: 352-273-9492

Academic Coordinator:

Holly Fremen
Email: holly.fremen@cop.ufl.edu
Office: HNP 4312
Phone: 352-273-5558
Absence/Tardy Email: absent1pd@cop.ufl.edu (Visit the course policy site for further instructions)

Educational Coordinator

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 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 gradebook (missing grades, wrong grade)
- Assistance with ExamSoft® (Distant campus students may contact Education 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.)