

# Cover Sheet: Request 11567

## PHA5XXX Year 1 Enhancement

### Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Diane Beck beck@cop.ufl.edu
Created	3/23/2017 6:24:50 AM
Updated	4/24/2017 8:06:15 PM
Description of request	This course provides pharmacy students with opportunity to enhance their knowledge/skills/abilities in a content area that is a component of the year 1 curriculum. This course provides opportunity for successful mastery through focused independent study and evaluation. **This course provides the mechanism for Summer remediation as outlined in the recently approved Academic Performance Standards for the Doctor of Pharmacy Program**

### Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	COP - Interdisciplinary Studies	Diane Beck		3/24/2017
No document changes					
College	Approved	COP - College of Pharmacy	Diane Beck		3/24/2017
No document changes					
University Curriculum Committee	Commented	PV - University Curriculum Committee (UCC)	Diane Beck	Added to the April agenda.	3/28/2017
No document changes					
University Curriculum Committee	Recycled	PV - University Curriculum Committee (UCC)	Diane Beck	There will be discussions between the Office of the APUA, The Registrar, and a representative for Pharmacy regarding necessary changes to this request.	4/19/2017
PHA 5XXX Year 1 Enhancement.docx					
College	Approved	COP - College of Pharmacy	Diane Beck	My understanding is that we would meet and then discuss again at the May UCC meeting.	4/19/2017
No document changes					
University Curriculum Committee	Commented	PV - University Curriculum Committee (UCC)	Diane Beck	Added to the May agenda.	4/24/2017
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			4/24/2017
No document changes					
Statewide Course Numbering System					
No document changes					

Step	Status	Group	User	Comment	Updated
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

## Course|New for request 11567

### Info

**Request:** PHA5XXX Year 1 Enhancement

**Description of request:** This course provides pharmacy students with opportunity to enhance their knowledge/skills/abilities in a content area that is a component of the year 1 curriculum. This course provides opportunity for successful mastery through focused independent study and evaluation.

**\*\*This course provides the mechanism for Summer remediation as outlined in the recently approved Academic Performance Standards for the Doctor of Pharmacy Program\*\***

**Submitter:** Diane Beck beck@cop.ufl.edu

**Created:** 4/17/2017 11:01:44 AM

**Form version:** 3

### Responses

**Recommended Prefix**PHA

**Course Level** 5

**Number** XXX

**Category of Instruction** Introductory

**Lab Code** None

**Course Title**Year 1 Enhancement

**Transcript Title**Yr1 Enhancement

**Degree Type**Professional

**Delivery Method(s)**4136,4137,4138On-Campus, Off-Campus, Online

**Co-Listing**No

**Effective Term** Earliest Available

**Effective Year**2017

**Rotating Topic?**Yes

**Repeatable Credit?**Yes

**If repeatable, # total repeatable credit allowed**2

**Amount of Credit**1

**S/U Only?**Yes

**Contact Type** Regularly Scheduled

**Weekly Contact Hours** 4-7

**Course Description** This course provides pharmacy students with opportunity to enhance knowledge/skills/abilities in a content area that is a component of the year 1 curriculum. This course provides opportunity for successful mastery through focused independent study and evaluation.

**Prerequisites** First year standing in the Doctor of Pharmacy curriculum with a grade of D+,D, or D- in a course that focused on a given content area

**Co-requisites** None

**Rationale and Placement in Curriculum** This course is offered during summer semester at the end of the first year. This placement allows students to remediate any deficiencies before progressing into Fall of year 2.

The Pharm.D. program academic standards require that students achieve the minimum academic standard (grade of C- or higher) in each required course. For students who achieved a passing grade below this competency standard (eg., D+ to D-), this course provides opportunity to demonstrate competency (grade of C- or higher) through remediation. A premise related to remediation is that since the student has already experienced all instruction in the course, successful mastery of the material can be accomplished with a period of focused study and review followed by passing an examination with a grade of C- or higher.

**Course Objectives** Upon completion of this course, the student will accomplish the following:

1. Identify a content area that was covered during the first year curriculum and where more focused study is needed to demonstrate competency.
2. Apply self-directed learning skills (including time management) to accomplish independent study in one or two competency areas.

3. Demonstrate the knowledge/skills that have been established for the content area that is the focus of this course. (Specific knowledge/skills by content area are listed in Appendix A)

**Course Textbook(s) and/or Other Assigned Reading** The textbooks appropriate for each content area are listed in Appendix C.

Appendix C. Required Textbooks by Content Area

Content Area: Pharmaceutics

1. Allen LV, Ansel HC. *Pharmaceutical Dosage Forms and Delivery Systems*, 10th Ed., Lippincott Williams and Wilkins.
2. Washington N, Washington C, Wilson C. *Physiological Pharmaceutics: Barriers to Drug Absorption*, 2nd Ed, Taylor & Francis, 2001. An E-book available on-line at UF library.
3. Amiji MM, Cook TJ, Mobley W. eds. *Applied Physical Pharmacy 2e*. New York, NY: McGraw-Hill; 2013. Available via the HSC Library via Online - Access Pharmacy.
4. Thompson, JE. *A Practical Guide to Contemporary Pharmacy Practice*, 3rd Edition. Lippincott Williams and Wilkins.

Additional Resources

1. Micromedex – Online and available through the UF library
2. DrugBank – Online database available through the UF Library

Content Area: Medicinal Chemistry & Pharmacology

1. Foye WO, Lemke T, Williams DA. *Foye's Principles of Medicinal Chemistry*, Wolters Kluwer Health/Lippincott Williams & Wilkins, Philadelphia, PA, 7th Edition, 2013. ISBN-13:978-1609133450; ISBN-10:1609133455
2. Brunton L. *Goodman and Gilman's The Pharmacological Basis of Therapeutics*, McGraw-Hill Professional, New York, NY, 12th Edition, 2011. ISBN-13:978-0071624428; ISBN-10:0071624422 Available via the HSC Library via Online - Access Pharmacy)

Content Area: Pathophysiology and Patient Assessment – Part 1 and Part 2

1. Chapters and other readings from online HSC Library ebooks (Available via the HSC Library via Online - Access Pharmacy and AccessMedicine).
2. Nemire R, Kier K, Assa-Eley MT. *Pharmacy Student Survival Guide*. 3rd Edition. McGraw-Hill, (Chapter 11 – Interpretation of Clinical Laboratory Data).

**Weekly Schedule of Topics** Since this is an individualized study course, the schedule will depend on the content areas the student has to remediate. See the outline/schedule of exams in Appendix B.

Course Outline (See Appendix B for Content Area Outlines)

Types of Remediation. The type of remediation and assessment will be determined based on whether competency must be demonstrated for knowledge, skills, and/or attitudes.

Development of the Assessment/Exam. The faculty member will develop a remediation assessment/exam that is of the same difficulty (breadth and depth) as the assessment/exam in the regular course. If an examination is administered, the faculty member may use a different format for questions compared to the original examination. For example, the original examination may have had multiple choice questions and the makeup may use short answer questions. If a simulation or OSCE is used to assess skills, the scenario or case difficulty and complexity should be similar to the original simulation or OSCE. The checklists used to assess the skill should be equivalent to the original checklist.

Course Learning Resources. Students may access resources relevant to the content area/course by accessing the original course site in Canvas. The learning resources include: video lectures by faculty, handouts, articles, etc.

Student Responsibility: Independent Study

The student is responsible for developing a personal self-study plan that will provide for a focused study of the course materials. The student should meet with the course leader for assistance in preparing this self-study plan. If the student desires assistance from the course leader, it is the student's responsibility to initiate the contact and request assistance. If the student feels the requested assistance is not being provided, the student must first discuss the request with the course leader. If the assistance still does not meet the student's need, the student may appeal to the Associate Dean for Curricular Affairs.

Faculty Responsibility: Guidance & Assessment

The course leader is responsible for assisting the student if a personal plan of study is requested. If the student seeks assistance in clarifying content or explaining materials, the course leader may refer

the student to the faculty member who taught the content, a graduate student, or another individual with expertise in the material. If the student is referred to another individual, the course leader is responsible for making sure the individual is available to assist the student. The course leader and other instructors will determine the level of assistance that is deemed appropriate. If the course leader is unable to provide what a student requests, the faculty member should seek assistance from the Associate Dean for Curricular Affairs and Accreditation.

### **Links and Policies** Course Policies

Please refer to the University Attendance Policy concerning exams at <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

#### Exam Policy

During any Exam:

1. Students must wait outside the testing room until the proctor enters
  2. The following items are not allowed to be accessed during the exam: cell phones, other electronic or digital devices including smart watches, pagers, photographic devices, and recording devices. Any watches must be placed on the top of the desk for proctor review.
  3. All backpacks, purses or other bags should be kept away from the student's designated testing space and must not be accessed during the exam. Nonessential materials are NOT allowed at the student's desk during examination periods. Please leave all nonessential materials outside of or in the front of the examination room.
  4. Students must arrive and be seated promptly to be eligible to take the exam. To maintain exam security, students who arrive late for the exam will not be allowed to start the exam if they are more than 30 minutes late or if another student has left the room after seeing the exam. Students who have valid reasons for arriving late at the exam may request a makeup exam as outlined below.
  5. There must be no talking or other disruptive behavior during the distribution or taking of the exam.
  6. Calculators must meet the following requirements: Only nonprogrammable calculators are allowed unless the course has a specific policy.
    1. If you encounter calculator problems (e.g., dead battery), contact the Proctor.
    2. Other exam rules may be instituted during the progression of the course.
    3. Once the exam commences, students may not leave the room without first turning in the exam. Once the exam is turned in, the examination period for the student is considered complete and the student must leave the examination room.
    4. If there is urgent need to use the restroom, the Proctor will provide guidance.
- Failure to follow exam rules may be considered as evidence of academic dishonesty.

#### After an Exam

Policy across All 1PD-3PD courses where ExamSoft is used:

1. Students are required to upload the encrypted exam file within 24 hours of completing the exam to the SofTest website.
  - a. If the encrypted file is not uploaded within 24 hours, the student's exam score will be reduced by 10%.
2. Graded exam appeals
  - a. There are no exam appeals except in instances where the student deems there is a possible grading/grade calculation error. Following release of the exam grades, the student has 3 business days to contact the Teaching Partner and Academic Coordinator to clarify questions and appeal any possible grading errors.

#### Make-up Exam Policy

Policy across All 1PD-3PD courses:

Makeup exams are given only under special circumstances and only for excused absences. Student attendance may be excused in the following situations: serious illness (3 or more consecutive days requires a health care provider note/documentation), serious family emergencies, military obligation, severe weather conditions, religious holidays, and other reasons of that are of serious nature or unexpected. Absences from class for court-imposed legal obligations (e.g., jury duty or subpoena) will be excused. The Pharm.D. calendar allows for participation in special curricular requirements (e.g., professional meetings). For unusual situations (e.g., wedding that was planned before admission), the student is expected to have already informed the Office of Student Affairs.

If the student is unable to take a scheduled exam, the Teaching Partnership Leader/Course Director

and Academic Coordinator must be notified before the exam or if it is an emergency situation, as soon as possible. The instructor will arrange an alternate deadline for the exam consistent with the University examination policies.

The questions on the makeup assessment may be in the form of essay, short answer, or multiple-choice and will be the same level of difficulty as the assessment administered during the scheduled time. With the exception of highly extenuating circumstances, failure to follow the prescribed procedures or failure to be present for the make-up assessment will result in a grade of zero for that exam. No precedence can be drawn from any courses in the College of Pharmacy or any other college within University of Florida.

General College of Pharmacy Course Policies

The following policies apply to all courses in the College of Pharmacy and are available on the COP website:

#### University Grading Policies

Please visit the following URL to understand how the University uses the course grade to compute your overall GPA: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

#### Concerns, Appeals, and Complaints

Students who have concerns about their evaluation of performance and/or student-faculty relations should review the Student-Faculty Handbook for guidance. The Student-Faculty Handbook also outlines the chain of command for any appeals and/or complaints.

#### Academic Integrity Policy

Students are expected to act in accordance with the University of Florida policy on academic integrity (<http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php>). This Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult the course's Teaching Partnership Leader/Course Director.

Students are also expected to abide by the UF Honor Code.

The following is the UF Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code.

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

#### Psychomotor and Learning Expectations

Psychomotor expectations relate to the ability to meet the physical demands of the pharmacy curriculum. Physically impaired students and students with learning disabilities such as hearing impairment, visual impairment, dyslexia or other specific learning disabilities such as sensory deficit or sensory-motor coordination problems should cooperate with the faculty and staff in addressing these circumstances in order to meet academic standards.

#### How to Request Learning Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered with the Disability Resource Center, students will receive an accommodation letter which must be presented to both the instructor and academic coordinator to utilize classroom accommodations. Students registered with the Disability Resource Center who are requesting clinical accommodations for rotations or clinical experiences should contact their Learning Specialist in the Disability Resource Center. Students with disabilities should follow this procedure as early as possible

in the semester.

Additionally, students at all College of Pharmacy campuses are expected to provide a copy of the accommodation letter of the Office of Student Affairs by email ([carswell@cop.ufl.edu](mailto:carswell@cop.ufl.edu)), fax (352-273-6219) or in person at G235 (Student Services Suite) of the Health Professions, Nursing and Pharmacy Building since some learning activities, exams, and assessments require additional assistance. The College of Pharmacy highly encourages that this procedure be completed before each course begins. Being proactive in this process will ensure that accommodations are in place for each student's learning activities, exams, and assessments because grades cannot be retroactively changed.

#### Faculty and Course Evaluations

Students are expected to provide feedback on the quality of instruction in every course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open around mid-semester and need to be completed by the established deadline. Summary results of these assessments are available to students at <https://evaluations.ufl.edu>.

#### Computer and Other Technology Requirements

Students are required to meet the following computer and technology requirements:

<http://pharmacy.ufl.edu/education/student-affairs/admissions/student-computer-requirements/>

ExamSoft® is used for administration of exams and students are required to follow the procedures that are established for exam administration. Students must bring a laptop to class to complete exams and this laptop must meet the computer and technology requirements established by the College. Students must also complete mock exams prior to the actual exam to assure that all computer features are supported by ExamSoft®.

#### Communications

##### Course-related Communications

Students with questions about course content should post questions on the discussion board. As noted in the attendance policy, communications about class attendance/absence should be emailed to [absent1PD@cop.ufl.edu](mailto:absent1PD@cop.ufl.edu). The student may email the course leader for any other needs that are personal in nature (e.g., request for accommodations, personal issues such as illness, emergencies).

##### Faculty member Response Time:

1. The course faculty will work to respond to discussion board postings and email communications within 24 hours of the posting between Monday and Friday 12N. Responses on weekends and holidays will be sporadic. (On weekends when assignments are due, students are advised to post questions before 12 Noon on Friday.)

##### Email Communications:

1. When communicating with faculty via email, the subject line needs to include the course number & title.
2. At the end of the email, in addition to listing your name, list your academic year and campus/site.

##### Discussion Board Policy

The purpose of the discussion board is to provide a venue for you to enhance your learning. This is accomplished by having a thread for each module where you can post questions to the course faculty. (A thread is a single link that is devoted to a topic.) The discussion board is also a place where your instructors may post virtual cases for you to work up.

Such interaction on the discussion boards with the instructors will allow you to clarify your questions and apply what you are learning in other parts of the course. The goal of these discussions is to help you learn.

##### Students Netiquette on the Discussion Board:

1. Post your comment on the correct discussion thread. If you have a question about A1 (Unit A - Module 1), post it in the discussion thread for A1 and not the B1 thread.
2. The discussion board is not a place to complain. Complaints should instead be directed directly to the Teaching Partnership Leader/Course Director via a professional email. This allows the Teaching Partnership Leader/Course Director to quickly address your concern without causing distraction to other students who have limited time and want to focus on learning.
3. Use "netiquette." If you have never learned "netiquette" - please visit the following URL:

<http://www.albion.com/netiquette/corerules.html> If you follow the rules of netiquette described in this URL, you will avoid posting an embarrassing or inappropriate comment.

4. The discussion board has been designed to allow you a place to ask further questions on the material to clarify any confusion, gain a deeper understanding of the material, or ask general course questions. A question you might see on a discussion board is "What do I need to study for the exam?" Please reflect on how this question can be perceived by your lecturing faculty as well as your fellow classmates. Rewording the question to address a specific topic would be more appropriate. For example, "Dr. XX, you listed numerous side effects for drug XX on slide XX. Of those, what are the most relevant that we could expect to occur and monitor for in clinical practice." The type of material that is covered in these classes is material that is important for patient care. All of this material is important. There are variations in courses, but please make use of your syllabus since there might be guidance on how to prepare for various exams in your classes.

5. In most situations, lectures are released as planned by the Teaching Partnership Leader/Course Director. Clarifying at the beginning of a semester on the planned release date/time, if not posted in the syllabus, is appropriate. Continual posts on the discussion board on weekly basis can become overwhelming for the course coordinator as well as your fellow students.

#### Student Complaint Process

Concerns about the course (e.g., course requirements, quizzes, exams) should first be discussed with the appropriate course instructor and the Teaching Partnership Leader/Course Director. If a satisfactory resolution is not achieved, the student may appeal to the Associate Dean for Curricular Affairs and Accreditation who will also engage other individuals depending on the request (e.g., campus dean, department chair, Associate Dean for Student Affairs). If the student finds the decision unsatisfactory, the student may appeal to the Dean of the College of Pharmacy. If this decision is unsatisfactory, the student may appeal to the Ombuds office ([https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf)).

#### Religious Holidays

Please see the University policy on attendance and religious holidays:

<http://www.registrar.ufl.edu/catalog/policies/regulationattendance.html#religious>.

#### Counseling and Wellness Center

Students who are experiencing issues and events that could adversely affect academic performance and personal health should be encouraged to meet with the Teaching Partnership Leader/Course Director or Associate Dean for Student Affairs for guidance. Students in the Gainesville area may contact the UF Counseling and Wellness Center for Gainesville students (352-392-1575; <http://www.counseling.ufl.edu>). Students outside the Gainesville area may obtain similar contact information from the campus/program administrator.

#### Emergencies

Call the University Police Department for emergencies: 392-1111 or 9-1-1

#### Student Crisis

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Students who are experiencing issues and events are also encouraged to contact their local crisis center. For Alachua County the Crisis Center number is 352-264-6789; for Jacksonville and Duval County 904-632-0600 and toll free for Northeast Florida at 1-800-346-6185; and for Orlando 407-425-2624.

The following national call numbers are also available for students who reside outside of the main COP campuses: a) 1-800-273-8255, and b) 1-800-784-2433.

#### How to Access Services for Student Success

Students who need guidance for course success or who are having academic difficulty should contact the Teaching Partnership Leader/Course Director. In addition, students are encouraged to contact



their advisor or Campus Director/Associate Dean for Student Affairs for assistance.  
Faculty Lectures/Presentations/Course Materials Download Policy  
Photography, audio-visual recording, and transmission/distribution of classroom lectures, course materials, and discussions is prohibited unless there is expressed written permission.

Recorded lectures and class sessions are authorized solely for the purpose of individual or group study with other UF College of Pharmacy students enrolled in the same class. Such recordings may not be reproduced, shared, or uploaded to publicly accessible web environments. Students who do not adhere to this policy will be considered to be breaching COP copyrights and/or FERPA law.

#### Faculty and Staff: Who to Contact

##### Academic Coordinator/Education Coordinator:

1. Issues related to course policies (absences, make up exams, missed attendance)
2. Absence requests (Only the Academic Coordinator handles absence requests)
3. Questions about dates, deadlines, meeting place
4. Availability of handouts and other course materials
5. Assignment directions
6. Questions about grade entries gradebook (missing grades, wrong grade)
7. Assistance with ExamSoft® (Distant campus students may contact Education Coordinator for use of SofTest and assistance during exams. The Academic Coordinator is the contact person for issues related to grading and posting of ExamSoft grades.)

##### Course Faculty

1. Questions about grades
2. Concerns about performance
3. Guidance when there are performance problems (failing grades)
4. General questions about content

##### Technical Support:

For technical support related to eLearning, educational videos, mobile learning tools and other course-related issues, contact College of Pharmacy Educational Technology Support at:

- Gainesville Office Hours: HPNP Rm. 4312 or 4309, Monday – Friday, 8:30 am to 4:30 pm
- E-mail: [edu-help@ahc.ufl.edu](mailto:edu-help@ahc.ufl.edu)
- Phone: 352-273-9492

Contact the University of Florida Computing Help Desk for issues related to Gatorlink accounts, UF e-mail, ONE.UF, myUFL and other centralized UF systems, contact UF Computing Help Desk at:

- Website: <https://my.it.ufl.edu/CherwellPortal/UFITServicePortal>
- E-mail: [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu)
- Help Wiki: <https://wiki.helpdesk.ufl.edu/>
- Phone: (352) 392-4357

**Grading Scheme** The grading scheme depends on the content area needing remediation. the syllabus contains a table with this information. Below is pasted from the table.

Content Area	Remediation Exam Dates	Requirement to Pass the Course
Pharmaceutics	Exam 1 – May 16 (Tu) @ 10am Exam 2 – May 19 (F) @ 10am Exam 3 – May 25 (Th) @ 10am Exam 4 - June 2 (F) @ 10am	Mean percentage grade of 69.5% or higher on the four required exams
Medicinal Chemistry & Pharmacology	Exam 1 – May 25 (Th) @ 10am Exam 2 – June 2 (F) @ 10am	Mean percentage grade of 69.5% or higher on the two required exams
Pathophysiology & Patient Assessment	Exam 1 – June 12 (M) @ 10:00am Exam 2 – June 21 (W) @ 10am Exam 3 – July 3 (M) @10am	Mean percentage grade of 69.5% or higher on the three required exams
Pathophysiology & Patient Assessment	Exam 1 – July 17 (M) @ 10am Exam 2 – July 26 (W) @ 10am Exam 3 – Aug 4 (F) @ 10am	Mean percentage grade of 69.5% or higher on the three required

exams

**Instructor(s)** William Cary Mobley, R.Ph., Ph.D.  
Margaret O. James, Ph.D.,  
Bin Liu, Ph.D.,

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**PHA 5XXXX Year 1 Enhancement**  
**Summer 2017**  
**1 Credit Hour**

**Course Purpose:**

This course provides pharmacy students with opportunity to enhance knowledge/skills/abilities and demonstrate competency in a content area that is a component of the year 1 curriculum. This course provides opportunity for successful mastery through focused independent study and evaluation.

**How Course Relates to PharmD Program Requirements**

The Pharm.D. program academic standards require that students achieve the minimum academic standard (grade of C- or higher) in each required course. For students who achieved a passing grade below this competency standard (eg., D+ to D-), this course provides opportunity to demonstrate competency (grade of C- or higher) through remediation. A premise related to remediation is that since the student has already experienced all instruction in the course, successful mastery of the material can be accomplished with a period of focused study and review followed by passing an examination with a grade of C- or higher.

**Course Faculty and Office Hours****Office hours arranged upon request**

**William Cary Mobley, R.Ph., Ph.D.**, Email: [mobley@cop.ufl.edu](mailto:mobley@cop.ufl.edu), Office: HPNP 1315, Phone: 352-273-6282

**Margaret O. James, Ph.D.**, Email: [mojames@ufl.edu](mailto:mojames@ufl.edu), Phone: 352- 273-7707

**Bin Liu, Ph.D.**, Email: [liu@cop.ufl.edu](mailto:liu@cop.ufl.edu), Office: MSB P2-31; Phone: 352-273-7747

**Academic Coordinator**

See Course Outline

**Course-Level Objectives**

Upon completion of this course, the student will accomplish the following:

1. Identify a content area that was covered during the first year curriculum and where more focused study is needed to demonstrate competency.
2. Apply self-directed learning skills (including time management) to accomplish independent study in one or two competency areas.
3. Demonstrate the knowledge/skills that have been established for the content area that is the focus of this course. (Specific knowledge/skills by content area are listed in **Appendix A**)

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### **Pre-Requisite**

First year standing in the Doctor of Pharmacy curriculum with a grade of D+,D, or D- in a course that focused on a given content area.

### **Co-Requisite**

None

### **Course Outline (See Appendix B for Content Area Outlines)**

**Types of Remediation.** The type of remediation and assessment will be determined based on whether competency must be demonstrated for knowledge, skills, and/or attitudes.

**Development of the Assessment/Exam.** The faculty member will develop a remediation assessment/exam that is of the same difficulty (breadth and depth) as the assessment/exam in the regular course. If an examination is administered, the faculty member may use a different format for questions compared to the original examination. For example, the original examination may have had multiple choice questions and the makeup may use short answer questions. If a simulation or OSCE is used to assess skills, the scenario or case difficulty and complexity should be similar to the original simulation or OSCE. The checklists used to assess the skill should be equivalent to the original checklist.

**Course Learning Resources.** Students may access resources relevant to the content area/course by accessing the original course site in Canvas. The learning resources include: video lectures by faculty, handouts, articles, etc.

#### **Student Responsibility: Independent Study**

The student is responsible for developing a personal self-study plan that will provide for a focused study of the course materials. The student should meet with the course leader for assistance in preparing this self-study plan. If the student desires assistance from the course leader, it is the student's responsibility to initiate the contact and request assistance. If the student feels the requested assistance is not being provided, the student must first discuss the request with the course leader. If the assistance still does not meet the student's need, the student may appeal to the Associate Dean for Curricular Affairs.

#### **Faculty Responsibility: Guidance & Assessment**

The course leader is responsible for assisting the student if a personal plan of study is requested. If the student seeks assistance in clarifying content or explaining materials, the course leader may refer the student to the faculty member who taught the content, a graduate student, or another individual with expertise in the material. If the student is referred to another individual, the course leader is responsible for making sure the individual is available to assist the student. The course leader and other instructors will determine the level of assistance that is deemed appropriate. If the course leader is unable to provide what a student requests, the faculty member should seek assistance from the Associate Dean for Curricular Affairs and Accreditation.

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**Content Areas and Exam Dates.**

<b>Content Area</b>	<b>Year 1 Course</b>	<b>Remediation Exam Dates</b>	<b>Faculty and Staff Support</b>
Pharmaceutics	PHA 5176 Drug Delivery Systems	Exam 1 – May 16 (Tu) @ 10am Exam 2 – May 19 (F) @ 10am Exam 3 – May 25 (Th) @ 10am Exam 4 - June 2 (F) @ 10am	Dr. Cary Mobley Ms. Candace Wallace Ms. Julie Thomas
Medicinal Chemistry & Pharmacology	PHA 5439 Principles of Medicinal Chemistry & Pharmacology I	Exam 1 – May 25 (Th) @ 10am Exam 2 – June 2 (F) @ 10am	Dr. Margaret James Ms. Candace Wallace Ms. Julie Thomas
Pathophysiology & Patient Assessment	PHA 5560 Pathophysiology & Patient Assessment I	Exam 1 – June 12 (M) @ 10:00am Exam 2 – June 21 (W) @ 10am Exam 3 – July 3 (M) @10am	Dr. Bin Liu Ms. Dorci Nance Instructional Designer – TBA/Mr. Shane Ryan
Pathophysiology & Patient Assessment	PHA 5561 Pathophysiology & Patient Assessment II	Exam 1 – July 17 (M) @ 10am Exam 2 – July 26 (W) @ 10am Exam 3 – Aug 4 (F) @ 10am	Dr. Bin Liu Ms. Dorci Nance Instructional Designer – TBA/Mr. Shane Ryan

## Weekly Schedule

Since this is an individualized study course, the schedule will depend on the content areas the student has to remediate. See the outline/schedule of exams in Appendix B.

## Textbooks

**The following textbooks are required:**

1. The textbooks appropriate for each content area are listed in **Appendix C**.

## Materials and Supplies Fees:

None

## Student Evaluation & Grading

### Evaluation Methods and how grades are determined

**Minimum Passing Score.** In order to pass the remediation assessment/exam, the student must achieve a mean percentage score of at least 69.5% on the exams that required for the designated content area.

The exams for each content area are listed below.

Content Area	Remediation Exam Dates	Requirement to Pass the Course
Pharmaceutics	Exam 1 – May 16 (Tu) @ 10am Exam 2 – May 19 (F) @ 10am Exam 3 – May 25 (Th) @ 10am Exam 4 - June 2 (F) @ 10am	Mean percentage grade of 69.5% or higher on the four required exams
Medicinal Chemistry & Pharmacology	Exam 1 – May 25 (Th) @ 10am Exam 2 – June 2 (F) @ 10am	Mean percentage grade of 69.5% or higher on the two required exams
Pathophysiology & Patient Assessment	Exam 1 – June 12 (M) @ 10:00am Exam 2 – June 21 (W) @ 10am Exam 3 – July 3 (M) @ 10am	Mean percentage grade of 69.5% or higher on the three required exams
Pathophysiology & Patient Assessment	Exam 1 – July 17 (M) @ 10am Exam 2 – July 26 (W) @ 10am Exam 3 – Aug 4 (F) @ 10am	Mean percentage grade of 69.5% or higher on the three required exams

**Rounding of grades:** Final grades in Canvas will be rounded to the 2<sup>nd</sup> decimal place. If the decimal is 69.495 or higher, Canvas will round the grade to 69.50. 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. **Appendix A** outlines who to contact if you have questions about technology.

1. ExamSoft®
2. Canvas® Learning Management System

## Course Policies

Please refer to the University Attendance Policy concerning exams at <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

## Exam Policy

### ***During any Exam:***

1. Students must wait outside the testing room until the proctor enters
2. The following items are not allowed to be accessed during the exam: cell phones, other electronic or digital devices including smart watches, pagers, photographic devices, and recording devices. Any watches must be placed on the top of the desk for proctor review.
3. All backpacks, purses or other bags should be kept away from the student’s designated testing space

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and must not be accessed during the exam. Nonessential materials are NOT allowed at the student's desk during examination periods. Please leave all nonessential materials outside of or in the front of the examination room.

4. Students must arrive and be seated promptly to be eligible to take the exam. To maintain exam security, students who arrive late for the exam will not be allowed to start the exam if they are more than 30 minutes late or if another student has left the room after seeing the exam. Students who have valid reasons for arriving late at the exam may request a makeup exam as outlined below.
  5. There must be no talking or other disruptive behavior during the distribution or taking of the exam.
  6. Calculators must meet the following requirements: Only nonprogrammable calculators are allowed unless the course has a specific policy.
    1. If you encounter calculator problems (e.g., dead battery), contact the Proctor.
    2. Other exam rules may be instituted during the progression of the course.
    3. Once the exam commences, students may not leave the room without first turning in the exam. Once the exam is turned in, the examination period for the student is considered complete and the student must leave the examination room.
    4. If there is urgent need to use the restroom, the Proctor will provide guidance.
- Failure to follow exam rules may be considered as evidence of academic dishonesty.*

### ***After an Exam***

#### **Policy across All 1PD-3PD courses where ExamSoft is used:**

1. Students are required to upload the encrypted exam file within 24 hours of completing the exam to the SofTest website.
  - a. If the encrypted file is not uploaded within 24 hours, the student's exam score will be reduced by 10%.
2. Graded exam appeals
  - a. There are no exam appeals except in instances where the student deems there is a possible grading/grade calculation error. Following release of the exam grades, the student has 3 business days to contact the Teaching Partner and Academic Coordinator to clarify questions and appeal any possible grading errors.

### **Make-up Exam Policy**

#### **Policy across All 1PD-3PD courses:**

Makeup exams are given only under special circumstances and only for excused absences. Student attendance may be excused in the following situations: serious illness (3 or more consecutive days requires a health care provider note/documentation), serious family emergencies, military obligation, severe weather conditions, religious holidays, and other reasons of that are of serious nature or unexpected. Absences from class for court-imposed legal obligations (e.g., jury duty or subpoena) **will be** excused. The Pharm.D. calendar allows for participation in special curricular requirements (e.g., professional meetings). For unusual situations (e.g., wedding that was planned before admission), the student is expected to have already informed the Office of Student Affairs.

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If the student is unable to take a scheduled exam, the Teaching Partnership Leader/Course Director and Academic Coordinator must be notified before the exam or if it is an emergency situation, as soon as possible. The instructor will arrange an alternate deadline for the exam consistent with the University examination policies.

The questions on the makeup assessment may be in the form of essay, short answer, or multiple-choice and will be the same level of difficulty as the assessment administered during the scheduled time. With the exception of highly extenuating circumstances, failure to follow the prescribed procedures or failure to be present for the make-up assessment will result in a grade of zero for that exam. No precedence can be drawn from any courses in the College of Pharmacy or any other college within University of Florida.

## **General College of Pharmacy Course Policies**

The following policies apply to all courses in the College of Pharmacy and are available on the COP website:

### ***University Grading Policies***

Please visit the following URL to understand how the University uses the course grade to compute your overall GPA: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### ***Concerns, Appeals, and Complaints***

Students who have concerns about their evaluation of performance and/or student-faculty relations should review the Student-Faculty Handbook for guidance. The Student-Faculty Handbook also outlines the chain of command for any appeals and/or complaints.

### ***Academic Integrity Policy***

Students are expected to act in accordance with the University of Florida policy on academic integrity (<http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php>). This Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult the course's Teaching Partnership Leader/Course Director.

Students are also expected to abide by the UF Honor Code.

The following is the UF Honor Pledge: *We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code.*

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*



### ***Psychomotor and Learning Expectations***

Psychomotor expectations relate to the ability to meet the physical demands of the pharmacy curriculum. Physically impaired students and students with learning disabilities such as hearing impairment, visual impairment, dyslexia or other specific learning disabilities such as sensory deficit or sensory-motor coordination problems should cooperate with the faculty and staff in addressing these circumstances in order to meet academic standards.

### ***How to Request Learning Accommodations***

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered with the Disability Resource Center, students will receive an accommodation letter which must be presented to both the instructor and academic coordinator to utilize classroom accommodations. Students registered with the Disability Resource Center who are requesting clinical accommodations for rotations or clinical experiences should contact their Learning Specialist in the Disability Resource Center. Students with disabilities should follow this procedure as early as possible in the semester.

Additionally, students at all College of Pharmacy campuses are expected to provide a copy of the accommodation letter of the Office of Student Affairs by email ([carswell@cop.ufl.edu](mailto:carswell@cop.ufl.edu)), fax (352-273-6219) or in person at G235 (Student Services Suite) of the Health Professions, Nursing and Pharmacy Building since some learning activities, exams, and assessments require additional assistance. The College of Pharmacy highly encourages that this procedure be completed before each course begins. Being proactive in this process will ensure that accommodations are in place for each student's learning activities, exams, and assessments because grades cannot be retroactively changed.

### ***Faculty and Course Evaluations***

Students are expected to provide feedback on the quality of instruction in every course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open around mid-semester and need to be completed by the established deadline. Summary results of these assessments are available to students at <https://evaluations.ufl.edu>.

### ***Computer and Other Technology Requirements***

Students are required to meet the following computer and technology requirements: <http://pharmacy.ufl.edu/education/student-affairs/admissions/student-computer-requirements/>

ExamSoft® is used for administration of exams and students are required to follow the procedures that are established for exam administration. Students must bring a laptop to class to complete exams and this laptop must meet the computer and technology requirements established by the College. Students must also complete mock exams prior to the actual exam to assure that all computer features are supported by ExamSoft®.

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## Communications

### Course-related Communications

Students with questions about course content should post questions on the discussion board. As noted in the attendance policy, communications about class attendance/absence should be emailed to [absent1PD@cop.ufl.edu](mailto:absent1PD@cop.ufl.edu). The student may email the course leader for any other needs that are personal in nature (e.g., request for accommodations, personal issues such as illness, emergencies).

### Faculty member Response Time:

1. The course faculty will work to respond to discussion board postings and email communications within 24 hours of the posting between Monday and Friday 12N. Responses on weekends and holidays will be sporadic. (On weekends when assignments are due, students are advised to post questions before 12 Noon on Friday.)

### Email Communications:

1. When communicating with faculty via email, the subject line needs to include the course number & title.
2. At the end of the email, in addition to listing your name, list your academic year and campus/site.

### Discussion Board Policy

The purpose of the discussion board is to provide a venue for you to enhance your learning. This is accomplished by having a thread for each module where you can post questions to the course faculty. (A thread is a single link that is devoted to a topic.) The discussion board is also a place where your instructors may post virtual cases for you to work up.

Such interaction on the discussion boards with the instructors will allow you to clarify your questions and apply what you are learning in other parts of the course. The goal of these discussions is to help you learn.

### Students Netiquette on the Discussion Board:

1. Post your comment on the correct discussion thread. If you have a question about A1 (Unit A - Module 1), post it in the discussion thread for A1 and not the B1 thread.
2. The discussion board is not a place to complain. Complaints should instead be directed directly to the Teaching Partnership Leader/Course Director via a professional email. This allows the Teaching Partnership Leader/Course Director to quickly address your concern without causing distraction to other students who have limited time and want to focus on learning.
3. Use "netiquette." If you have never learned "netiquette" - please visit the following URL: <http://www.albion.com/netiquette/corerules.html> If you follow the rules of netiquette described in this URL, you will avoid posting an embarrassing or inappropriate comment.
4. The discussion board has been designed to allow you a place to ask further questions on the material to clarify any confusion, gain a deeper understanding of the material, or ask general course questions. A question you might see on a discussion board is "What do I need to study for the exam?" Please reflect on how this question can be perceived by your lecturing faculty as well as your fellow classmates. Rewording the question to address a specific topic would be more appropriate. For example, "Dr. XX, you listed numerous side effects for drug XX on slide XX. Of those, what are the most relevant that we could expect to occur and monitor for in clinical practice." The type of material that is covered in these classes is material that is

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important for patient care. All of this material is important. There are variations in courses, but please make use of your syllabus since there might be guidance on how to prepare for various exams in your classes.

5. In most situations, lectures are released as planned by the Teaching Partnership Leader/Course Director. Clarifying at the beginning of a semester on the planned release date/time, if not posted in the syllabus, is appropriate. Continual posts on the discussion board on weekly basis can become overwhelming for the course coordinator as well as your fellow students.

### **Student Complaint Process**

Concerns about the course (e.g., course requirements, quizzes, exams) should first be discussed with the appropriate course instructor and the Teaching Partnership Leader/Course Director. If a satisfactory resolution is not achieved, the student may appeal to the Associate Dean for Curricular Affairs and Accreditation who will also engage other individuals depending on the request (e.g., campus dean, department chair, Associate Dean for Student Affairs). If the student finds the decision unsatisfactory, the student may appeal to the Dean of the College of Pharmacy. If this decision is unsatisfactory, the student may appeal to the Ombuds office ( [https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf) ).

### **Religious Holidays**

Please see the University policy on attendance and religious holidays:

<http://www.registrar.ufl.edu/catalog/policies/regulationattendance.html#religious>.

### **Counseling and Wellness Center**

Students who are experiencing issues and events that could adversely affect academic performance and personal health should be encouraged to meet with the Teaching Partnership Leader/Course Director or Associate Dean for Student Affairs for guidance. Students in the Gainesville area may contact the UF Counseling and Wellness Center for Gainesville students (352-392-1575; <http://www.counseling.ufl.edu>). Students outside the Gainesville area may obtain similar contact information from the campus/program administrator.

### **Emergencies**

Call the University Police Department for emergencies: 392-1111 or 9-1-1

### **Student Crisis**

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Students who are experiencing issues and events are also encouraged to contact their local

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crisis center. For Alachua County the Crisis Center number is 352-264-6789; for Jacksonville and Duval County 904-632-0600 and toll free for Northeast Florida at 1-800-346-6185; and for Orlando 407-425-2624.

The following national call numbers are also available for students who reside outside of the main COP campuses: a) 1-800-273-8255, and b) 1-800-784-2433.

### **How to Access Services for Student Success**

Students who need guidance for course success or who are having academic difficulty should contact the Teaching Partnership Leader/Course Director. In addition, students are encouraged to contact their advisor or Campus Director/Associate Dean for Student Affairs for assistance.

### **Faculty Lectures/Presentations/Course Materials Download Policy**

Photography, audio-visual recording, and transmission/distribution of classroom lectures, course materials, and discussions is prohibited unless there is expressed written permission.

Recorded lectures and class sessions are authorized solely for the purpose of individual or group study with other UF College of Pharmacy students enrolled in the same class. Such recordings may not be reproduced, shared, or uploaded to publicly accessible web environments. Students who do not adhere to this policy will be considered to be breaching COP copyrights and/or FERPA law.

## **Faculty and Staff: Who to Contact**

### **Academic Coordinator/Education Coordinator:**

1. Issues related to course policies (absences, make up exams, missed attendance)
2. Absence requests (Only the Academic Coordinator handles absence requests)
3. Questions about dates, deadlines, meeting place
4. Availability of handouts and other course materials
5. Assignment directions
6. Questions about grade entries gradebook (missing grades, wrong grade)
7. Assistance with ExamSoft® (Distant campus students may contact Education Coordinator for use of SofTest and assistance during exams. The Academic Coordinator is the contact person for issues related to grading and posting of ExamSoft grades.)

### **Course Faculty**

1. Questions about grades
2. Concerns about performance
3. Guidance when there are performance problems (failing grades)
4. General questions about content

### **Technical Support:**

For technical support related to eLearning, educational videos, mobile learning tools and other course-related issues, contact **College of Pharmacy Educational Technology Support** at:

- Gainesville Office Hours: HPNP Rm. 4312 or 4309, Monday – Friday, 8:30 am to 4:30 pm
- E-mail: edu-help@ahc.ufl.edu

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- Phone: 352-273-9492

Contact the **University of Florida Computing Help Desk** for issues related to Gatorlink accounts, UF e-mail, ONE.UF, myUFL and other centralized UF systems, contact UF Computing Help Desk at:

- Website: <https://my.it.ufl.edu/CherwellPortal/UFITServicePortal>
- E-mail: [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu)
- Help Wiki: <https://wiki.helpdesk.ufl.edu/>
- Phone: (352) 392-4357

## Appendix A. Learning Objectives by Content Area

### Content Area: Pharmaceutics

#### 1. Drug Development, Approval, and Manufacture

- a. Explain the drug development and approval processes for new chemical entities, generic and orphan drugs, drugs for compassionate use, and for changes in the drug product.
- b. Describe the most critical concepts in the manufacture of sterile and non-sterile dosage forms, the standards for good manufacturing practices, and nature of compendial standards for chemicals, devices, and drug products.

#### 2. Biopharmaceutics

- a. Describe the concepts important for understanding and predicting the relationships between the physicochemical properties of the drug, the drug's fate in the body after its administration as a dosage form, and the resulting onset, duration, and intensity of drug action.
- b. In the therapeutic reasoning process, assess the biopharmaceutical properties of drug products and drugs during the evaluation of therapeutic alternatives, and during the implementation and monitoring of therapeutic selection(s).

#### 3. Fundamental Physicochemical Properties

- a. Describe the fundamental physicochemical properties that are important for the rational design and formulation of stable dosage forms.
- b. Develop causal explanations for the effects of fundamental physicochemical properties on the biopharmaceutical behavior of drugs and dosage forms in the body.
- c. In the diagnostic reasoning process, determine and explain any implicated relationships between the drug's physicochemical properties and drug therapy problems.

#### 4. Chemical and Physical Drug Stability

- a. Explain the major mechanisms of drug and dosage form chemical and physical instability, including formulation ingredient incompatibilities.
- b. Describe formulation, packaging, and storage approaches for optimizing drug and drug product stability.
- c. Assess and recommend solutions for potential chemical and physical stability problems during the evaluation of therapeutic alternatives and during the implementation and monitoring of therapeutic selection(s).

#### 5. Drug Dosage Forms

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- a. Explain the nature of all pharmaceutical dosage forms, including how they are designed, formulated, manufactured, compounded, and quality tested.
  - b. In the therapeutic reasoning process, assess and recommend the dosage form(s) and route(s) of administration that will best enable the patients to reach his or her therapeutic goal(s).

#### *6. Drug Dosage Form Administration*

- a. Explain the anatomical and physiological properties important for drug delivery for all parenteral and non-parenteral routes of drug administration.
- b. In the diagnostic reasoning process, determine and explain any implicated relationships between the dosage form or its administration and drug therapy problems.
- c. In the therapeutic reasoning process, assess and recommend the route(s) and techniques of dosage form administration that will best enable the patient to reach his or her therapeutic goal(s) and minimize untoward effects.

#### *7. Pharmaceutical Calculations*

- a. Demonstrate competence in performing pharmaceutical calculations according to standards that maximize accuracy and precision and to minimize the risk for error.
- b. Assess the reasonableness of answers based on the understanding of the goals and purpose of the calculation.
- c. Calculate therapeutic and nutritional needs for the patient and the formulation, dosing, and delivery requirements for products and preparations.

#### *8. Drug Preparation Compounding*

- a. Explain compounding skills that are used for the most common types of sterile and non-sterile preparations, employing standards of good compounding practices and compounding regulations.
- b. Integrate knowledge of physicochemical properties, biopharmaceutics, and dosage form design and administration with knowledge of pharmacotherapy and the patient's health status, to assess the ability of the proposed compounded preparation to achieve the therapeutic goals for the patient.
- c. Provide rational counseling advice for the proper usage of compounded preparations.

#### *9. Control of Drug Delivery*

- a. Describe the rationale and approaches for the spatial and temporal control of drug delivery, describing examples, advantages and disadvantages for each route of drug administration.
- b. In the therapeutic reasoning process, be able to explain the rationale for selecting controlled delivery products for use in specific patients and the rationale for choosing among different controlled release products of the same drug.
- c. Make recommendations for switching between controlled and immediate release products during patient therapy.

#### *10. Pharmaceuticals of Recombinant Therapeutic Proteins and Related Biologics*

- a. Explain the production, physicochemical properties, stability, formulation, and delivery of therapeutic proteins that distinguish biologics from small molecule compounds.
- b. Understand the development and approval process for biosimilar biological products.
- c. Recommend proper storage, handling, and administration techniques of therapeutic proteins.

### **Content Area: Medicinal Chemistry & Pharmacology**

1. Develop and integrate knowledge about principles of medicinal chemistry and pharmacology.

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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 pKa, 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.
  9. Predict drug-drug, drug-food, and related interactions based on alterations of drug metabolism.
  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.
  12. Predict drug-drug, drug-food, and related interactions based on alterations of drug transport
  13. Predict degree of ionization of acids and bases from the Henderson Hasselbalch equation.
  14. Estimate the pH of solutions of weak acids and bases.
  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.

### **Content Area: Pathophysiology and Patient Assessment – Part 1**

1. Discuss the primary tenets of cell theory, ion channels, equilibrium potentials, and the resting membrane potential.
2. Explain the ionic basis of the action potential in various types of excitable cells.
3. Explain primary neuromuscular functions and related diseases.
4. Cover basic anatomy and physiology of the autonomic nervous system.
5. Explain neural, endocrine and local mechanisms involved in regulation of cardiac and vascular function
6. Explain relationship of cardiovascular disease to underlying pathophysiology of valves, cardiac conduction, cardiac performance or vascular dysfunction.
7. Explain renal mechanisms controlling water and sodium homeostasis
8. Apply knowledge of renal function to explain the pathophysiology involving fluid and electrolyte imbalances that accompany acute and chronic renal dysfunction
9. Explain mechanisms of control of respiration
10. Applies mechanics of respiration in patient assessment: volume, pressure, airflow in respiratory cycle
11. Establish a basic understanding of tumorigenesis, metastasis and diagnosis
12. Discuss the impact of pulmonary tumors on respiratory functions
13. Interpret and evaluate patient assessment findings related to the following body systems:
  - a. Plasma/cell-membrane
  - b. Cardiovascular
  - c. Renal
  - d. Pulmonary

## Content Area: Pathophysiology and Patient Assessment – Part 2

1. Differentiate between the mediators for innate and adaptive immunity and describe their involvement in immune responses
2. Understand the roles of various mediators in the inflammatory responses
3. Describe how the gastrointestinal system functions and the pathophysiology of common gastrointestinal disorders related to disruption of motility, absorption or secretion.
4. Describe the endocrine control of: male and female reproduction and growth
5. Describe endocrine control of glucose, lipid and calcium homeostasis.
6. Describe the endocrine factors contributing to regulation of appetite and satiety
7. Understand the pathophysiology of glucose and lipid metabolism in types of diabetes.
8. Describe the pathophysiology of the neurological system including the following: excitatory and inhibitory amino acids, neurotransmitters, and sensory processing.
9. Understand the neurocircuitry for movement regulation and the pathophysiology related to movement disorders
10. Describe the brain blood supply system and the pathophysiology related to stroke development.
11. Describe the physical signs and lab values that represent the physiological changes that occur in the following systems which are discussed during this course:
  - Immunological
  - Gastroenterological
  - Endocrine
  - Neurological

## Appendix B. Course Outlines by Content Area

### Content Area: Pharmaceutics

Mod & Unit	Unit Topic Learning Resources will include Lecture Videos and readings.	Faculty	Learning Objectives
Mod 1	Course Overview, New Drug Development, Introduction To Biopharmaceutics, Pharmaceutical Pre-formulation	Mobley	1-3
	<u>Online/Individual Study:</u> <u>Readings:</u> 1. "Introduction to Biopharmaceutics" (Ch. 1 in A.P.P. textbook)		
	<u>Educational Videos:</u> 1. Course Overview	Mobley	



	2. New Drug Development	Mobley	
	3. Introduction To Biopharmaceutics I	Mobley	
	4. Introduction To Biopharmaceutics II	Mobley	
	5. Pharmaceutical Preformulation I	Mobley	
	6. Pharmaceutical Preformulation II	Mobley	
	7. Pharmaceutical Preformulation III	Mobley	
	<b>Complete:</b> Online Quiz 1		
<b>Mod 1</b>	<b>Preformulation, Drug Stability, Parenteral Drug Delivery</b>	<b>Mobley</b>	<b>4,5,6</b>
	<b>Online/Individual Study:</b>	Mobley	
	<b>Educational Videos:</b>		
	1. Pharmaceutical Preformulation IV		
	2. Drug Stability I	Mobley	
	3. Drug Stability II	Mobley	
	4. Parenteral Drug Delivery I	Mobley	
	5. Parenteral Drug Delivery II	Mobley	
<b>Mods 1 &amp; 2</b>	<b>Parenteral Drug Delivery, Introduction to Pharmaceutical Calculations, Overview of Compounding</b>	<b>Mobley</b>	<b>5,6,7 1,2,3,5,6</b>
	<b>Online/Individual Study:</b>	Mobley	
	<b>Educational Videos:</b>		
	1. Parenteral Drug Delivery III		
	2. Parenteral Drug Delivery IV	Mobley	
	3. Introduction to Calculations I	Mobley	
	4. Introduction to Calculations II	Mobley	
	5. Overview of Compounding I	Mobley	
<b>Mod 2</b>	<b>Overview Of Pharmacy Compounding Powders And Granules, Capsules</b>	<b>Mobley</b>	<b>5,6,7,8</b>
	<b>Online/Individual Study:</b>	Mobley	
	<b>Educational Videos:</b>		
	1. Overview of Compounding II		
	2. Powders/Granules I	Mobley	
	3. Powders/Granules II	Mobley	
	4. Capsules I	Mobley	
	5. Capsules II	Mobley	
<b>May 16</b>	<b>Assessment:</b>		
	<ul style="list-style-type: none"> <li>Module 1, Exam 1 – New Drug Development to Parenterals</li> </ul>		
<b>Mod 2</b>	<b>Tablets, Oral Liquids</b>	<b>Mobley</b>	<b>5,6,7,8</b>
	<b>Online/Individual Study:</b>	Mobley	
	<b>Educational Videos:</b>		
	1. Tablets I		

	2. Tablets II	Mobley	
	3. Oral Liquids I	Mobley	
	4. Oral Liquids II	Mobley	
	5. Oral Liquids III	Mobley	
<b>Mod 3</b>	<b>Oral Liquids , Sublingual and Buccal Drug Delivery, Rectal Drug Delivery</b>	<b>Mobley</b>	<b>5,6,7,8</b>
	<b>Online/Individual Study:</b>	Mobley	
	<b>Educational Videos:</b>		
	1. Oral Liquids IV		
	2. Oral Liquids V	Mobley	
	3. Sublingual/Buccal Drug Delivery	Mobley	
	4. Rectal Drug Delivery I	Mobley	
	5. Rectal Drug Delivery II	Mobley	
<b>May 19</b>	<b>Assessment:</b>		
	<ul style="list-style-type: none"> <li>Module 2, Exam 2: Intro to Pharmaceutical Calculations to Tablets</li> </ul>		
<b>Mods 3 &amp; 4</b>	<b>Topical Drug Delivery, Vaginal Drug Delivery, Ophthalmic Drug Delivery</b>	<b>Mobley</b>	<b>5,6 5,6,7,8</b>
	<b>Online/Individual Study:</b>	Mobley	
	<b>Educational Videos:</b>		
	1. Topical Drug Delivery I		
	2. Topical Drug Delivery II	Mobley	
	3. Topical Drug Delivery III / Vaginal Drug Delivery	Mobley	
	4. Ophthalmic Drug Delivery I	Mobley	
	5. Ophthalmic Drug Delivery II	Mobley	
	<b>In-Class Activity:</b>		
	<ul style="list-style-type: none"> <li>In-Class Problem-Solving Exercise</li> </ul>		
<b>Mod 4</b>	<b>Intranasal Drug Delivery , Pulmonary Drug Delivery, Advanced Drug Delivery</b>	<b>Mobley</b>	<b>5,6,9</b>
	<b>Online/Individual Study:</b>	Mobley	
	<b>Educational Videos:</b>		
	1. Intranasal Drug Delivery		
	2. Pulmonary Drug Delivery I	Mobley	
	3. Pulmonary Drug Delivery II	Mobley	
	4. Pulmonary Drug Delivery III / Advanced Drug Delivery I	Mobley	
	5. Advanced Drug Delivery II	Mobley	
<b>May 25</b>	<b>Assessment:</b>		
	<ul style="list-style-type: none"> <li>Exam 3: Oral Liquids to Vaginal Drug Delivery</li> </ul>		
<b>Mod 4</b>	<b>Advanced Drug Delivery , Pharmaceutical Biotechnology</b>	<b>Mobley</b>	<b>9, 10 5,6,9</b>

	<b>Online/Individual Study:</b>	Mobley	
	<b>Educational Videos:</b>		
	1. Advanced Drug Delivery III		
	2. Advanced Drug Delivery IV	Mobley	
	3. Advanced Drug Delivery V	Mobley	
	4. Pharmaceutical Biotechnology I	Mobley	
	5. Pharmaceutical Biotechnology II	Mobley	
<b>June 2</b>	<b>Final Exam - Ophthalmic Drug Delivery to Pharmaceutical Biotechnology</b> (Core Concepts are Comprehensive)		

### Content Area: Medicinal Chemistry & Pharmacology

Mod & Unit	Unit Topic Learning Resources will include Lecture Videos and readings.	Faculty	Learning Objectives
<b>Mod 01</b>	<b>How New Drugs are Developed: Natural Products and Drug Discovery</b>	<b>H. Luesch</b>	<b>1-4</b>
Lectures 1 & 2	<b>Lecture Videos:</b> <ul style="list-style-type: none"> <li>From plants to natural products to marketed drug</li> <li>Complementary drug discovery approaches</li> <li>Emerging new sources and targets of drugs</li> </ul>	Luesch	
Lecture 3		Luesch	
Lecture 4		Luesch	
<b>Mod 02</b>	<b>Relationships of Functional Groups to Pharmacological Activity – Part 1</b>	<b>R. Huigens</b>	<b>1,5,6,13, 14,15</b>
Lecture 1	<b>Lecture Videos:</b> <ul style="list-style-type: none"> <li>Basic organic chemistry of drug molecules</li> <li>Types of functional groups</li> <li>Estimated pKa values</li> <li>Degree of ionization at pH 7.4 and 2.0</li> <li>Estimation of water solubility</li> <li>Partition coefficients</li> </ul>	Huigens	
Lectures 2 & 3		Huigens	
Lecture 4		Huigens	
Lecture 5		Huigens	
<b>Mod 02</b>	<b>Relationships of Functional Groups to Pharmacological Activity – Part 1, cont.</b>	<b>R. Huigens</b>	<b>1,5</b>
Lectures 6 & 7	<b>Lecture Videos:</b> 6. Continuation of topics from Module 2	Huigens	

Lecture 8		Huigens	
Lecture 9		Huigens	
<b>Mod 03</b>	<b>Relationships of Functional Groups to Pharmacological Activity – Part 2</b>	<b>Y. Ding</b>	<b>1,5,6</b>
Lectures 1 & 2	<b>Lecture Videos:</b> <ul style="list-style-type: none"> <li>• Stereochemistry</li> <li>• Interactions of functional groups with receptors (give concrete examples)</li> <li>• Salt bonds</li> <li>• Covalent bonds</li> <li>• Hydrogen bonds</li> <li>• Van der Waals interactions</li> </ul>	Ding	
Lecture 3		Ding	
<b>Mod 03</b>	<b>Relationships of Functional Groups to Pharmacological Activity – Part 2, cont.</b>	<b>Y. Ding</b>	<b>1-6, 17</b>
Lectures 4 & 5	<b>Lecture Videos:</b> <ol style="list-style-type: none"> <li>6. Continuation of topics from Module 3</li> </ol>	Ding	
Lecture 6		Ding	
<b>Mod 04</b>	<b>Metabolism</b>	<b>M. James</b>	<b>8,9,10,12</b>
	<b>Mod 4 Readings:</b> <ol style="list-style-type: none"> <li>1. Foye textbook, chapter 4, pages 106-190</li> <li>2. Goodman and Gilman textbook, chapter 3</li> </ol>		
Lectures 1 & 2	<b>Lecture Videos:</b> <ol style="list-style-type: none"> <li>6. Major pathways of drug metabolism</li> <li>7. Predict the pathways of metabolism of drugs based on analysis of functional groups</li> </ol>	James	
<b>May 25</b>	<b>Exam I (Mods 1-3)</b>		
<b>Mod 04</b>	<b>Metabolism, Cont.</b>	<b>M. James</b>	<b>8,9,10,12</b>
Lectures 3 & 4	<b>Lecture Videos/Live in GNV:</b> <ul style="list-style-type: none"> <li>• Predict drug interactions based on metabolism of functional groups</li> <li>• Effect of biotransformation – therapeutic activity and toxicity</li> <li>• Organs where biotransformation occurs and entero-hepatic cycling</li> </ul>	James	
Lectures 5 & 6		James	

Lectures 7 & 8	<ul style="list-style-type: none"> <li>Factors affecting rate and extent of biotransformation</li> <li>Regulation of drug-metabolizing enzymes by genetic and environmental factors, and implications for drug therapy</li> <li>Predict drug-drug, drug-food, and related interactions based on alterations of drug metabolism.</li> </ul>	James	
<b>Mod 05</b>	<b>Prodrugs and Soft Drugs (Examples that are sold)</b>	<b>Y. Ding</b>	<b>16</b>
	<b>Readings:</b> 1. Foye textbook, chapter 3, pages 74-76		
Lectures 1 & 2	<b>Lecture Videos:</b> <ul style="list-style-type: none"> <li>Definition of prodrugs and soft drugs</li> <li>Key advantages of these drugs</li> <li>Development of these drugs</li> <li>Metabolism of prodrugs and soft drugs leading to drug action</li> </ul>	Ding	
Lecture 3		Ding	
<b>Mod 06</b>	<b>Physicochemical and Biopharmaceutical Properties of Drug Substances: Drug Absorption</b>	<b>M. James</b>	<b>11</b>
	<b>Readings:</b> 1. Foye textbook, chapter 3, pages 61-70 and 73-74 2. Foye textbook, chapter 5, pages 191-207 3. Goodman and Gilman textbook, chapter 2		
Lectures 1 & 2	<b>Lecture Videos:</b> <ul style="list-style-type: none"> <li>Drug absorption <ul style="list-style-type: none"> <li>i) Facilitated transport</li> <li>ii) Passive transport</li> <li>iii) Active transport</li> <li>iv) Influx vs efflux transporters</li> </ul> </li> </ul>	James	
Lecture 3		James	
<b>June 2</b>	<b>Final Exam</b>		

### Content Area: Pathophysiology and Patient Assessment – Part 1

<b>Mod &amp; Unit</b>	<b>Unit Topic</b> Learning Resources will include Lecture Videos and readings.	<b>Faculty</b>	<b>Learning Objectives</b>
<b>Mod 01</b>	<b>Introduction to the Course; Review of Cell Function and Membrane Structure</b>	<b>B. Liu, J. Frazier</b>	<b>1,2</b>

Lectures 1 & 2	<b>Pre-Recorded Lecture Videos:</b> <ul style="list-style-type: none"> <li>• Cell Membranes</li> <li>• Receptors and 2<sup>nd</sup> Messengers</li> <li>• Resting Membrane Potential and Action Potential</li> <li>• Muscles</li> </ul>	Frazier	
Lectures 3 & 4			
Lectures 5 & 6			
Lectures 7 - 9			
	<b>Review:</b> Pharmacy Student Survival Guide, Chapter 11		
	<b>Complete:</b> Online Self-Assessment 1		
<b>Mod 01</b>	<b>Muscle Function and Pathophysiology</b>	<b>J. Frazier</b>	<b>1,2</b>
Lectures 10 - 12	<b>Pre-Recorded Lecture Videos:</b> <ul style="list-style-type: none"> <li>• Autonomic Nervous System</li> </ul>	Frazier	
Lectures 13 & 14			
<b>June 12</b>	<b>Exam, Mod 1 material (Locations TBA)</b>		
<b>Mod 02</b>	<b>Cardiovascular Pathophysiology</b>	<b>M. Keller-Wood</b>	<b>4,5</b>
	<b><u>Online/Individual Study:</u></b> <b>Readings:</b> 7. Access Medicine: Lange CV Physiology (Chapters listed in Canvas)		
	8. Access Medicine: Lange Ganong's Review of Medical Physiology (Chapters listed in Canvas)		
Lectures 1 & 2	<b>Pre-Recorded Lecture Videos:</b> <ul style="list-style-type: none"> <li>• Cardiovascular Overview</li> <li>• Control of heart rate</li> <li>• Arrhythmias</li> </ul>	Keller-Wood	
Lectures 3 & 4			
<b>Mod 02</b>	<b>Cardiovascular Pathophysiology-Cont.</b>	<b>M. Keller-Wood</b>	<b>4,5</b>
	<b><u>Online/Individual Study:</u></b> <b>Readings:</b> 1. Access Medicine: Lange CV Physiology (Chapters listed in Canvas)		
	2. Access Medicine: The Big Picture Pathology (Chapters in Canvas)		
Lectures 5 & 6	<b>Pre-Recorded Lecture Videos:</b> <ul style="list-style-type: none"> <li>• Valve diseases</li> </ul>	Keller-Wood	

Lectures 7 & 8	<ul style="list-style-type: none"> <li>• Cardiomyopathies</li> <li>• Vascular</li> <li>• Vascular diseases</li> <li>• Edema</li> <li>• Compensations for exercise and disease</li> </ul>		
Lectures 9-11			
	<b>Review:</b> <ol style="list-style-type: none"> <li>1. Pharmacy Student Survival Guide, Chapter 11</li> <li>2. Blood Pressure and Heart Rate from Module 2 in the Professional Practice Skills Laboratory I course</li> </ol>		
	<b>Complete:</b> Online Self-Assessment 2 & 3		
<b>Mod 02</b>	<b>Cardiovascular Pathophysiology-Cont.</b>	<b>M. Keller-Wood</b>	<b>4,5</b>
<b>June 21</b>	<b>Exam, Mod 2 material (Locations TBA)</b>		
<b>Mod 03</b>	<b>Renal Pathophysiology</b>	<b>E. Krause</b>	<b>4-8</b>
Lectures 1 & 2	<b>Pre-Recorded Lecture Videos:</b> <ul style="list-style-type: none"> <li>• Renal Anatomy</li> <li>• Nephron Segment Function</li> </ul>	Krause	
Lecture 3			
<b>Mod 03</b>	<b>Renal Pathophysiology, Cont.</b>	<b>E. Krause</b>	<b>7,8</b>
Lectures 4 & 5	<b>Pre-Recorded Lecture Videos:</b> <ul style="list-style-type: none"> <li>• Water and Electrolyte Disorders</li> <li>• Regulation of Potassium</li> <li>• Regulation of Acid-Base Physiology</li> <li>• Acute / Chronic Renal Failure</li> </ul>	Krause	
Lectures 6 & 7			
Lecture 8			
	<b>Complete:</b> Online Self-Assessment 4		
<b>Mod 04</b>	<b>Respiration Pathophysiology</b>	<b>E. St. Onge /B. Liu</b>	<b>9,10</b>
	<b>Online/Individual Study:</b> <b>Supplemental Readings:</b> <ol style="list-style-type: none"> <li>1. Ganong's Review of Medical Physiology, 25e (Chapters listed in Canvas)</li> <li>2. Access Medicine: Harrison's Principles of Internal Medicine (link in Canvas)</li> <li>3. PFT and ABG example problems</li> </ol>		
Lectures 1-4	<b>Pre-Recorded Lecture Videos:</b> <ul style="list-style-type: none"> <li>• Pulmonary function</li> </ul>	St. Onge	

	<ul style="list-style-type: none"> <li>• Lung Mechanics</li> <li>• Ventilation /perfusion</li> <li>• O<sub>2</sub>/CO<sub>2</sub> exchange</li> <li>• Control of respiration</li> </ul>		
Live Lecture (GNV)	Cancer biology	Liu	
Live Lecture (GNV)	Tumor metastasis and lung cancer	Liu	
	<b>Review:</b> <ol style="list-style-type: none"> <li>1. Module 9 videos in your Professional Practice Skills Lab I course. In particular, focus on the videos that pertain to: Respiratory Assessment, Peak Flow and Spirometry</li> <li>2. Patient information handout for users of Peak Flow meters (Canvas)</li> </ol>		
	<b>Complete:</b> Online Self-Assessment 5		
<b>Mod 04</b>	<b>Respiration Pathophysiology, Cont.</b>	<b>St. Onge</b>	<b>9,10</b>
<b>July 2</b>	<b>Cumulative Final Exam</b>		

### Content Area: Pathophysiology and Patient Assessment – Part 2

Mod & Unit	Unit Topic Learning Resources will include Lecture Videos and readings.	Faculty	Learning Objectives
<b>Mod 00</b>	<b>Introductory Module/Orientation</b>	<b>B. Liu</b>	
<b>Mod 01</b>	<b>Immune Function and Inflammatory Response</b>	<b>B. Liu</b>	<b>1-2</b>
	<b>Lectures:</b> <ol style="list-style-type: none"> <li>6. Innate Immunity: cellular and molecular mediators</li> <li>7. Adaptive immunity: antigen recognition, processing, presentation</li> </ol>	Liu	
	<ol style="list-style-type: none"> <li>8. Adaptive immunity: B cells, T cells, antibodies</li> <li>9. Acute Inflammation</li> </ol>	Liu	
	<ol style="list-style-type: none"> <li>10. Chronic Inflammation</li> <li>11. Hypersensitivity and wound healing</li> </ol>	Liu	



<b>Mod 02</b>	<b>Gastrointestinal (GI) System</b>	<b>Khoury/ Soucie</b>	<b>3</b>
	<b><u>Online/Individual Study:</u></b> <b>Lectures:</b> 9. GI Lecture 1	Soucie	
	10. GI Lecture 2		
	11. GI Lecture 3	Khoury	
	12. GI Lecture 4		
	13. GI Lecture 5		
<b>Mod 03 4</b>	<b>Endocrine System</b>	<b>M. Keller- Wood/ S. Miller</b>	<b>4,5</b>
Lectures 1 & 2	<b><u>Online/Individual Study:</u></b> <b>Lectures:</b> 3. Overview of principles – feedback, homeostasis	Keller- Wood	
Lectures 3 & 4	4. Male reproduction 5. Female reproduction-menstrual cycle 6. Female reproduction – menopause, pregnancy		
<b>July 17</b>	Exam 1: Modules 1-2 (Immune Function-GI)		
Lecture 5	Endocrine Lecture, cont.	Keller-Wood	
<b>Mod 03</b>	<b>Endocrine System, Continued</b>	<b>M. Keller- Wood/Mille r/Yuan/Dot y</b>	<b>6,7</b>
Lecture 1	<b><u>Online/Individual Study:</u></b> <b>Lectures:</b>	Yuan	
Lectures 2 & 3	7. Glucose and Lipid Metabolism (adrenal, pancreas and gut hormones)		
Lectures 4 & 5	8. Control of food intake and obesity 9. Diabetes overview		
	1. Bone and Growth & Calcium Homeostasis 2. Thyroid hormone/Metabolism	Miller	
<b>Mod 04</b>	<b>Neurological System</b>	<b>Liu/ McLaughli n</b>	<b>8,9,10</b>

Lectures 1 & 2	<b>Online/Individual Study:</b> <b>Lectures:</b> 8. Excitatory and inhibitory amino acids 9. Serotonin and norepinephrine 10. Dopamine and acetylcholine 11. Peptide neurotransmitters 12. Pain and Sensation	McLaughlin	
<b>July 26</b>	Exam 2: Module 3 (Endocrine)		
Lectures 3 & 4	<ul style="list-style-type: none"> <li>Neuro. System lectures, cont.</li> </ul>	McLaughlin	
Lectures 5 & 6		McLaughlin	
Lecture 7		McLaughlin	
	13. Movement regulation and disorders 14. Stroke –Types and disease mechanisms	Liu	10
<b>Aug 4</b>	Exam 3: Cumulative		

## Appendix C. Required Textbooks by Content Area

### Content Area: Pharmaceutics

- Allen LV, Ansel HC. *Pharmaceutical Dosage Forms and Delivery Systems, 10<sup>th</sup> Ed.*, Lippincott Williams and Wilkins.
- Washington N, Washington C, Wilson C. *Physiological Pharmaceutics: Barriers to Drug Absorption, 2<sup>nd</sup> Ed*, Taylor & Francis, 2001. An E-book available on-line at UF library.
- Amiji MM, Cook TJ, Mobley W. eds. *Applied Physical Pharmacy 2e*. New York, NY: McGraw-Hill; 2013. **Available via the HSC Library via Online - Access Pharmacy.**
- Thompson, JE. *A Practical Guide to Contemporary Pharmacy Practice, 3rd Edition*. Lippincott Williams and Wilkins.

### Additional Resources

- Micromedex – Online and available through the UF library
- DrugBank – Online database available through the UF Library

### Content Area: Medicinal Chemistry & Pharmacology

- Foye WO, Lemke T, Williams DA. Foye's Principles of Medicinal Chemistry, Wolters Kluwer Health/Lippincott Williams & Wilkins, Philadelphia, PA, 7<sup>th</sup> Edition, 2013. ISBN-13:978-1609133450; ISBN-10:1609133455

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2. Brunton L. Goodman and Gilman's The Pharmacological Basis of Therapeutics, McGraw-Hill Professional, New York, NY, 12<sup>th</sup> Edition, 2011. ISBN-13:978-0071624428; ISBN-10:0071624422  
***Available via the HSC Library via Online - Access Pharmacy***

**Content Area: Pathophysiology and Patient Assessment – Part 1 and Part 2**

1. Chapters and other readings from online HSC Library ebooks (***Available via the HSC Library via Online - Access Pharmacy and AccessMedicine***).
2. Nemire R, Kier K, Assa-Eley MT. Pharmacy Student Survival Guide. 3<sup>rd</sup> Edition. McGraw-Hill, (Chapter 11 – Interpretation of Clinical Laboratory Data).