

**Biopharmaceutics I
SYLLABUS
PHAR 531
Fall 2012**

This syllabus is not to be construed as a contract with the student and may be subject to change.*

***The faculty reserves the right to change the course syllabus, effective upon the student receiving written notification (e-mail) and verbal notification during regular class hours.**

<u>Instructor</u>	<u>Office</u>	<u>Telephone</u>	<u>Email address</u>	<u>Office Hours</u>
Hasan Koc (Team leader)	117A	304-696-7368	kocha@marshall.edu	W 5:50-6:30**
Nicole Rockich Winston	104A	304-696-7369	winstonnn@marshall.edu	T 3:30-4:30**

****Instructors also available by appointment**

Course Description :

Topics covered include the physicochemical principles of pharmacy, such as acid-base theory, solubility, physical states of drugs, thermodynamics, drug stability, excipients, surfactants, dispersions, polymers, drug delivery, chemical compatibility and interactions of drugs in various dosage forms.

Prerequisites: P1 standing

Textbooks:

Handouts will be provided for the course. The majority of test and quiz questions (80%) will be derived from the handouts. For additional background and more complete understanding of the lectures topics, relevant sections from *A Practical Guide to Contemporary Pharmacy Practice* and *Physicochemical Principles of Pharmacy* will be suggested.

Required:

A Practical Guide to Contemporary Pharmacy Practice, Third Edition
Authors: Judith E. Thompson and Lawrence W. Davidow
Lippincott Williams & Wilkins
ISBN 978-0781-7839-65

Physicochemical Principles of Pharmacy, Fifth Edition
Authors: Alexander T. Florence; David Attwood
Pharmaceutical Press, Royal Pharmaceutical Society, London, UK
ISBN 978-0853-6998-42

The clicker from Turning Technologies (Model : ResponseCard RF LCD)

Recommended:

Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, Ninth Edition
Authors: Loyd V Allen, Jr., Nicholas G. Popovich; Howard C Ansel

Wolters Kluwer and Lippincott, Williams & Wilkins, Baltimore, Maryland
ISBN 978-0781-7793-40

Course Objectives:

Number	Objective	Ability Number	How assessed	NAPLEX Competencies
1	Describe, interpret and apply the physical-chemical principles of drugs and dosage forms	1	Student presentations, exams	1.2.5
2	Identify and predict the biological principles of dosage forms	1,25	In-class quizzes, exams	1.2.4, 1.2.5, 1.2.7
3	Recognize and explain the principles of drug delivery via dosage forms (e.g., liquid, solid, semi-solid, controlled release, patches)	10,25	Student presentations, exams	1.2.7, 2.2.3
4	Recognize and explain considerations in drug preformulation, excipients and packaging	25	Quizzes, exams	2.3.2
5	Define and classify the principles of dosage form stability and drug degradation in dosage forms	25	Quizzes, exams	2.3.3
6	Recall, summarize and illustrate the purpose and function of the following items: surfactants, emulsifying agents, solvents, preservatives, antioxidants, colors, flavors, sweeteners, scents, ointment bases, and suppository bases	1, 10, 25	Quizzes and exams	2.3.1, 2.3.2

Tentative Schedule of activities:

Date	Meeting format	Meeting topic	Instructor
Sept 24	Lecture (L), in-class activity	Introduction: course structure, grading, the drug development process	Dr. Winston
Sept 26	L, in-class activity, Quiz 1	Physical/bulk characteristics of solids	Dr. Koc
Oct 1	Student presentations (SP), L, Quiz 2	Physical/bulk characteristics of solids continued	Dr. Koc
Oct 3	SP, L, in-class activity	Dissolution applications	Dr. Koc
Oct 4	Exam 1		
Oct 8	SP, L, in-class activity	Tablets	Dr. Winston
Oct 10	SP, L	Solutions (osmotic properties, ionization)	Dr. Koc
Oct 11	Exam 2		
Oct 15	SP, L	Solutions (pH, buffers)	Dr. Koc
Oct 17	SP, L, Quiz 3	Drug stability (types of decomposition, kinetics)	Dr. Koc
Oct 22	SP, L, in-class activity	Drug stability (dosage form/shelf life); rheology	Dr. Winston
Oct 24	SP, L	Solubility	Dr. Winston
Oct 25	Exam 3		
Oct 29	SP, L, Quiz 4	Surfactants and emulsifying agents	Dr. Winston
Oct 31	SP, L	Surfactants continued	Dr. Winston
Nov 1	Exam 4		
Nov 5	SP, L	Disperse systems	Dr. Koc
Nov 7	SP, L, Quiz 5	Polymers and macromolecules	Dr. Koc
Nov 8	Exam 5		
Nov 12	SP, L, in-class activity	Pharmaceutical solvents	Dr. Winston
Nov 14	SP, L	Preservatives and antioxidants	Dr. Winston
Nov 15	Exam 6		
Nov 19		Thanksgiving – no classes	
Nov 21		Thanksgiving – no classes	
Nov 26	SP, L	Colors, flavors, sweeteners and scents	Dr. Winston
Nov 28	SP, L, Quiz 6	Ointment bases	Dr. Winston
Nov 29	Exam 7		
Dec 3	SP, L	Suppository bases	Dr. Winston
Dec 5	In-class activities	Review/recap	Dr. Koc

Point distribution and assessment:

<u>Assessment</u>	<u>Course Grade</u>
Quizzes	15%
Exams	40%
Comprehensive Final	15%
Active Learning Activities	5%
Presentations	25%
Total	100%

Letter grade distribution:

89.5-100%	A
79.5-89.49%	B
69.5-79.49%	C
≤ 69.49%	F

Course delivery, student evaluations and grading:

Course delivery methods will include lectures and student presentations with group discussion.

Quizzes or exams will be given on a weekly basis. Quizzes will cover the material discussed in the previous material and assigned readings. Exams will be administered weekly; consist of 20 multiple choice questions and/or short answer questions; and cover the material presented since the last exam. To pass the course, all students must receive a score of at least 69.5%. For any exam that a student does not receive a score of 69.5% or higher, they will have two additional chances to demonstrate their mastery of the material and improve their score to 70%. The cumulative score for the quizzes will account for 15% of the course grade. The cumulative scores for the exams will account for 40% of the course grade. There will be a comprehensive final at the end of the course that will account for 15% of the course grade.

Student groups will be presented with materials during the class period ranging from application questions to hands-on activities. Some activities may require group presentation to the class. Students will be evaluated throughout the semester on quality of participation. Active learning activities will account for 5% of the course grade.

Starting the second week, there will be short presentations by students that will be followed by discussion. The topic of these assigned presentations will be on relevant physicochemical properties associated with drug therapy. These presentations will be subjected to peer evaluation and credit will be given for student questions and critique during the discussion period following each presentation. The student presentations will consist of several PowerPoint slides and a write-up of up to 1 page. These presentations and write-ups will account for 25% of the course grade.

At least 80% of the questions on examinations and quizzes will come from course handouts. The remaining 20% of the questions will come from material covered in lectures and the student presentations.

Attendance policy:

Make up exams or quizzes will be given only in cases of extraordinary circumstances due to documented illness (a note from your doctor) or death of a family member. Work schedules, car problems and day care issues are not considered a valid excuse for missing exams.

UNIVERSITY POLICIES

University policies regarding **Academic Dishonesty, Students with Disabilities, University Computing Services' Acceptable Use, Affirmative Action, and Sexual Harassment** can be found at <http://www.marshall.edu/wpmu/academic-affairs/policies/>.

School of Pharmacy Policies**SOCIAL JUSTICE POLICY STATEMENT**

Marshall University is committed to bringing about mutual understanding and respect among all individuals and groups at the University. As part of Marshall University, School of Pharmacy has made a commitment to social justice. Therefore, no one will be discriminated against on the basis of race, gender, ethnicity, age, sexual orientation, religion, social class, or differing viewpoints. Each student will be viewed as a valuable member of this class and as the faculty for the course, I will strive to facilitate an atmosphere/learning environment where mutual understanding and respect are actualized.

ACADEMIC, ETHICAL, AND PROFESSIONAL CONDUCT

Student expections for academic, ethical, and professional conduct are defined within the school's *Ethical and Professional Conduct Policy*

(http://www.marshall.edu/wpmu/pharmacy/faculty_staff/faculty-and-staff-policies/200-006-ethical-and-professional-conduct/) and the university's *Academic Dishonesty Policy* (<http://www.marshall.edu/wpmu/academic-affairs/policies/>).

Test Security Policy

In order to ensure the security of all examinations, the School of Pharmacy has adopted the following policies:

1. Test Administration**A. Non-electronic testing**

- a. Students may not access any electronic equipment during the exam that has not been provided by the faculty, including but not limited to calculators, cell phones, laptops and PDAs.

B. Electronic testing

- a. Only those resources (electronic or otherwise) approved by the instructor may be used or accessed during the testing session.

- b. Students enrolled within courses using electronic testing must download and install the Respondus Lockdown Browser. The installation will require an installation code that must be acquired from Computing Services.

2. Test Review

- A. Students will not be allowed to view any exam without direct supervision of course faculty or site facilitator
- B. Students must review tests within time specified by the course faculty.
- C. Limited numbers of students may be allowed to view the exam at one time depending on office size, space, and faculty preference.
- D. Students will be allowed to review the exam only one time, and time limits may be placed on review as specified by course faculty.
- E. NO notes can be taken by the student while reviewing the test, and students are not allowed to access any electronics while reviewing the tests. NO copies electronic or written!
- F. Individual student printouts for exams are to be retained by the faculty.
- G. Faculty have the right to place further restrictions on test review as deemed necessary.