

**Spring 2008**  
**Syllabus PHR 924: Principles of Pharmaceutical Sciences**  
**New and Novel Dosage Forms & Drug Delivery Systems**

**I. Course Description**

This is the second course in the Pharmaceutics sequence. The course is designed to build upon those principles learned in PHR 914. This course will provide the knowledge base upon which the pharmacist will depend to make rational decisions about drug product therapy for patients as well as to design appropriate patient counseling.

PHR 924 deals with the science of delivery of drugs to the body via complex, specialized and novel dosage forms. A strong emphasis in the principles of physical diffusion through synthetic and biological barriers is made throughout the course. Delivery systems for a variety of important routes of administration including oral, parenteral, pulmonary, ophthalmic, topical, nasal, buccal, transdermal, rectal, and vaginal administration will be addressed. Material will also be covered pertaining to novel lipid and polymer-based drug delivery systems, needle-free injection devices, and drug targeting and gene and oligonucleotide delivery. The drug development process will also be addressed.

A typical lecture describes the anatomy and physiology of a particular route, delivery system concepts, and finally clinical and market products that utilize the delivery concepts.

**II. Faculty**

Course Coordinator

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## **Textbooks Required**

- ❖ *Remington: The Science and Practice of Pharmacy, 21<sup>st</sup> edition, Lippincott, Williams, & Wilkins (2005).*

Note: Required reading in Remington will be assigned by Faculty throughout the semester.

## **III. Grading**

There are three scheduled examinations and one cumulative final examination. The following table contains the point value of each examination.

Examination I	100 points
Examination II	100 points
Examination III	100 points
Final Examination	175 points
Quizzes	10 points each

**Total Points**                      **475-505 points**

In some instances, more than one professor will be providing material for an examination. The point value for such material on the examination will be split according to the number of lectures by each professor. No extra credit questions will be provided for the examinations.

Quizzes can be administered unannounced throughout the semester and will be given at any time. Each quiz will be worth 10 points. The one lowest quiz score for each student will be dropped. There will be no make-up quizzes administered. Students should come prepared to each lecture with clean 8 ½ x 11 paper for the quiz. Quizzes can cover any and all material presented since the previous quiz, including material covered during the same day of the quiz.

The final grade in the course will be calculated based on the number of points earned in examinations, homework and quizzes. Grades will be awarded on the following scale

A=	89.5% and above
B =	79.5% to 89.4%
C=	69.5% to 79.4%
D=	59.5% to 69.4%
F =	below 59.5%

#### IV. Course Rules and Regulations

Students are directed to the general policies for the College of Pharmacy in the Student Handbook, available online at <http://www.mc.uky.edu/pharmacy/acaffairs/handbook.pdf>

1. Contacting Instructors and Office Hours: Throughout the semester, students may have general questions, medical issues, or may wish to schedule a meeting with the Instructors. The best way to contact Instructors is via e-mail or by telephone.

The Instructors will communicate to the students via listserv to make general course announcements, assign required reading, and to send out class averages on quizzes and examinations. Please be certain that the College has your current email address at all times so that you will receive timely e-mail notification throughout the semester.

2. Attendance Policy: The Instructors firmly believe that regular class attendance is critical to success in the course. The faculty also believe that students are professionals who are empowered to make their own decisions. Consequently, class attendance will not be monitored.
3. Professional behavior is expected at all times. Professionalism is defined as treating the instructors, teaching assistants, and your fellow students in a respectful and courteous manner; completing small group activities accurately and efficiently; and leaving the classroom or work area in a clean and orderly manner. As part of treating others with respect, students and faculty alike are required to place cell telephones, iPods, pager devices or other electronic equipment in the non-audio mode so that students and faculty will not be disturbed during class. In no case will a student or faculty member speak on a cell telephone while in the classroom or during an examination. Video recording of classes is expressly prohibited.
4. Format of Lectures: A copy of the lecture material (usually Powerpoint slides) will be placed in your mailbox before each lecture. Assigned readings from Remington will be given prior to the start of a new lecture topic either during lecture or via listserv. Students should begin to read the assigned readings before the new lecture topic begins and plan to complete the readings in parallel to the lecture topic. Students may be quizzed or tested on the assigned reading material. *The handouts of the lecture material should guide the students as to what is to be emphasized in the assigned readings.* Learning "Objectives" for each lecture are clearly shown in each handout. These Objectives should also guide the students as to what information is to be emphasized for studying for quizzes and examinations.

Handouts of lecture materials have been designed for ease of presentation. Some important information that students must know may be omitted from the handout. Students should make sure that they attend the lectures to fill in the omitted material in their notes.

5. The instructors welcome and highly encourage questions from students anytime during the lecture. The instructor may call upon the students or a student at any time. In addition, the instructors may ask for a student or group of students to go up to the blackboard to assist in answering questions.
6. Cheating and Plagiarism: Except in those instances where students are explicitly instructed to submit work done as a group, students are expected to work and submit materials individually. Cheating and plagiarism will not be tolerated and will be prosecuted to the fullest extent possible. The student is directed to the "College of Pharmacy Honor Code" for further explanation. All examinations are taken in accordance with the Honor Code. It is a College of Pharmacy policy that it is up to each student to ensure that their own behavior during an examination is such that no doubt could possibly exist about their honesty and integrity.
7. Block Examinations: The block examination system does involve some hardships on students, most notably those with religious considerations, and every effort will be made to accommodate those

individuals. Please contact Dr. Bummer early in the semester if a re-scheduling of an examination is necessary for religious considerations.

Emergency medical situations also arise, making attendance at an examination impossible. In those situations, students are urged to notify Dr. Mumper (telephone 218-6522, leave a message) or Dr. Lubawy's office whenever practical. Early examination, oral examinations, and term papers may be required for examinations missed during excused absences. The right to request appropriate verification is reserved. Examinations missed without notification of Dr. Bummer (or Dr. Lubawy's office) will be graded as a zero.

Errors do occur in grading and students do have the right to have any error corrected promptly. The student has 7 days after return of materials to submit an examination for reconsideration, after which time, all grades become final. In the event that a student wishes to have an examination re-graded or to correct some putative error in the grade assignment, the full examination paper and a written request are to be submitted to Dr. Bummer. *The written request is to identify the area of concern and to state reasons why the student believes there is an error.* The more clearly this request is written out, the more rapidly the faculty member will be able to return the examination to the student. The right to re-grade the entire examination upon resubmission is hereby reserved by the faculty. Because a number of faculty members may be involved in the re-grading, the process may take a seemingly long period of time. Patience is appreciated.

8. **Severe Weather Policy:** The College of Pharmacy will operate according to University guidelines for classes, labs and exams in the event of severe weather. Official University announcements about closings are made on local radio and television stations. If the University is closed, then PHR 924 will be postponed during that period. As soon as possible the faculty in charge of a course, or the Academic Affairs Office, will send out a note on the class listserv describing the details for making up missed time. If no note is sent assume the activity previously scheduled for the day classes resume will be held that day, regardless of what was missed. You will be expected to check your e-mail regularly, **especially during inclement weather**. Notices about changes in schedules for a particular day's activities, especially activities the following morning, will ordinarily be sent before 9:00 PM the previous evening.

Missed regular class material will generally be made up during the course of the semester either with special sessions or through the regularly scheduled class times remaining during the semester. Students should be prepared however, for possible additional course meetings the day classes resume.

Missed examinations will generally be rescheduled whenever rooms are available. Students should be prepared to take a missed examination on the day classes resume and as soon as a room can be rescheduled. A note will be sent out on the class listserv as far in advance as possible. On occasion a note sent on the class listserv the morning classes resume may announce an exam time and place for that afternoon or early evening.

Saturday examinations are a particular challenge because the University does not ordinarily operate over the weekend. If inclement weather develops on the Saturday an examination is scheduled, and the instructor post pones the exam, they will send a message on the class listserv. If no message is posted, assume the examination is taking place as regularly scheduled.

9. **On-line Course Evaluation:** Regular course and instructor evaluations are required by state, university and college regulations. These evaluations are essential for improving student learning by providing feedback to faculty about their classroom presentations. Based on student feedback, important decisions are made about courses and how they are taught.

Individual responses are completely anonymous. However, the College of Pharmacy Office of Education track those who have completed each evaluation and send reminder notices. College of

Pharmacy requires that an incomplete grade (“I”) for the semester will be posted for those not completing the course evaluation. Upon completion of the course evaluation, the incomplete grade will be changed to the grade earned in the course.

10. Final course grades will NOT be made available to students before they are sent out by the Registrar’s Office. Faculty will not discuss the assignment of letter grades with students before they are released by the registrar. If a student believes he/she has received an inappropriate grade, the student must present his/her arguments in writing to Dr. Bummer, within one month following the end of the Spring Semester.

## **V. Class Schedule**

Monday and Wednesday 3:00-4:15 p.m. College of Nursing Room 201 (see class schedule on Syllabus)

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**PHR 924 Principles of Pharmaceutical Sciences II:**  
**New & Novel Dosage Forms & Drug Delivery System**  
**Monday and Wednesday; College of Nursing Room 201; 3:00 pm – 4:15 pm**

<b>Date</b>	<b>Day</b>	<b>Topic</b>	<b>Lecturer</b>	<b>Lecture #</b>
2-Jan	Wed	Drug Product Development	Wermeling	1
7-Jan	Mon	Drug Product Development	Wermeling	2
9-Jan	Wed	Oral Modified/Sustained Release	Anderson	3
14-Jan	Mon	Oral Modified/Sustained Release	Anderson	4
16-Jan	Wed	Oral Modified/Sustained Release	Anderson	5
21-Jan	Mon	MLK Holiday No Classes		
23-Jan	Wed	Topical/Transdermal Delivery	Stinchcomb	6
<b>26-Jan</b>	<b>Sat</b>	<b>BLOCK EXAM #1 (lectures 1-6): 100 points</b> <b>Room COP Rm 220/223 1:00 pm – 3:00 pm</b>		
30-Jan	Wed	Topical/Transdermal Delivery	Stinchcomb	7
4-Feb	Mon	Rectal/Vaginal Delivery	Stinchcomb	8
6-Feb	Wed	Rectal/Vaginal Delivery	Stinchcomb	9
11-Feb	Mon	Ophthalmic Delivery	Bummer	10
13-Feb	Wed	Ophthalmic Delivery	Bummer	11
18-Feb	Mon	Ophthalmic Delivery	Bummer	12
20-Feb	Wed	Pulmonary Delivery	Bummer	13
<b>22-Feb</b>	<b>Fri</b>	<b>BLOCK EXAM #2 (lectures 7-12): 100 points</b> <b>Rooms COP 220/223; 4:00 pm to 6:00 pm</b>		
27-Feb	Wed	Pulmonary Delivery	Bummer	14
3-Mar	Mon	Pulmonary Delivery	Bummer	15
5-Mar	Wed	Pulmonary Delivery	Bummer	16
10-Mar	Mon	SPRING BREAK No Classes		
12-Mar	Wed	SPRING BREAK No Classes		
17-Mar	Mon	Nasal Delivery	Bummer	17
19-Mar	Wed	Nasal Delivery	Bummer	18
24-Mar	Mon	Buccal/Sublingual Delivery	Bummer	19
26-Mar	Wed	Buccal/Sublingual Delivery	Bummer	20
<b>28-Mar</b>	<b>Fri</b>	<b>BLOCK EXAM #3 (lectures 13-18): 100 points</b> <b>Rooms COP 220/223; 4:00 pm to 6:00 pm</b>		
2-Apr	Wed	Parenteral Delivery	Bummer	21
7-Apr	Mon	Parenteral Delivery	Bummer	22
9-Apr	Wed	Parenteral Delivery	Bummer	23
14-Apr	Mon	Parenteral Delivery	Bummer	24
16-Apr	Wed	Parenteral Delivery	Bummer	25
<b>25-Apr</b>	<b>Fri</b>	<b>CUMULATIVE FINAL EXAM: 175 points</b> <b>75 points on lectures 1-18; 100 points on lectures 19-25</b> <b>Room COP 220/223 12 noon to 3 pm.</b>		