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School of Pharmacy

SYLLABUS

Integrated Laboratory 2

PHAR 611

(Fall, 2014)

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

The School of Pharmacy reserves the right to change the course syllabus. *The School should notify the students through the course notification system or by an email preferably through the Blackboard system.*

Materials used in this class may be copyrighted and should not be shared with individuals not enrolled in this course.

Course meeting days and time	Wednesday (section 1) or Thursday (section 2) 8-10:30 AM
Location	Student laboratory
Team Leader / Instructor	Drs. John Schloss / Brian Train
Office	CEB 211A
Phone	304-696-3094
Email	schloss@marshall.edu
Office hours	By appointment

Faculty	Email	Office	Phone Number	Office Hours / Appointments accepted?
Dr. John Schloss	schloss@marshall.edu	211A	304-696-3094	By appointment/in lab
Dr. Brian Train	trainb@marshall.edu	211/211A	304-696-7343	By appointment/in lab

Student: If the instructor accepts appointments, then please email the instructor for availability. The student can expect the instructor to respond to E-mails and phone messages within 72 hours.

Course Description: Practical hands-on experience in modern scientific methods used in biochemistry, pharmaceuticals, pharmacology, pharmacometrics; and analytical methods employed to detect, characterize, and quantitate naturally occurring substances and drug molecules.

Prerequisites: P2 standing

Text Books:

Required: None, handouts will be provided

Course Objectives:

Number	Objective	Linkage to MUSOP Abilities (list ability numbers)	How Assessed
1	Demonstrate competence in basic measurements fundamental to biomedical and pharmaceutical sciences	1, 10, 24, 35	Laboratory write-up Quiz Final Examination
2	Demonstrate competence in measuring metabolomics-based pathway dynamics	1, 10, 24, 35	Laboratory write-up Quiz Final Examination
3	Demonstrate competence in determining drug pharmacokinetics	1, 10, 24, 35	Laboratory write-up Quiz Final Examination
4	Demonstrate ability to perform all relevant calculations required for these demonstrations	1, 10, 24, 35	Laboratory write-up Quiz Final Examination

Schedule of Activities:

Date	Meeting Format	Meeting Topic	Course Student Learning Outcomes	Instructor
Aug 27/28	Laboratory	Weights and Volumes	Master use of micropipettes and balance calibration validation	Train/Schloss
Sept 3/4	Laboratory	pH and buffers	Apply the principles of acid-base theory to pH control and buffer preparation (1,10)	Train/Schloss
Sept 10/11	Laboratory	Protein assay	Apply the biuret method for selectively measuring protein concentration (1,10); critically evaluate different methods for measuring protein concentration in crude biological samples (1,10,24,35)	Train/Schloss
Sept 17/18	Laboratory	Carbohydrate assay	Apply the aniline and H ₂ SO ₄ -phenol methods for selectively measuring carbohydrate concentrations (1,10); critically evaluate different methods for measuring carbohydrate concentration in crude biological samples (1,10,24,35)	Train/Schloss
Sept 24/25	Laboratory	Triglyceride assay- Part 1	Apply titrimetric methods to determine triglyceride ester content(1,10); apply the Hantzsch reaction to selectively measure triglyceride concentration(1,10);	Train/Schloss

			apply saponification methods to prepare soap(1,10); evaluate the properties of an oil composed of triglycerides (1,10,24,35)	
Oct 1/2	Laboratory	Triglyceride assay- Part 2	Apply titrimetric methods to determine triglyceride ester content(1,10); apply the Hantzsch reaction to selectively measure triglyceride concentration(1,10); apply saponification methods to prepare soap(1,10); evaluate the properties of an oil composed of triglycerides (1,10,24,35)	Train/Schloss
Oct 8/9	Laboratory	Drug hydrolysis	Apply basic principles of physical chemistry to define aspirin solution stability(1,10); determine the activation energy for hydrolysis(1,10)	Train/Schloss
Oct 15/16	Laboratory	Drug solubility	Apply basic principles of pharmaceuticals to define solubility parameters for sodium benzoate, salicylic acid, and procaine hydrochloride (1,10)	Train/Schloss
Oct 22/23	Laboratory	Drug partitioning	Apply basic principles of pharmaceuticals to determine the octanol-water partition coefficient for chromophoric substances (1,10)	Train/Schloss
Oct 29/30	Laboratory	Enzymes – Endpoint Analyses	Demonstrate the ability to use an enzyme-based assay (1,10)	Train/Schloss
Nov 5/6	Laboratory	Inorganic analysis - Phosphate	Demonstrate competence in measuring the concentration of an inorganic substance by a colorimetric assay (1,10)	Train/Schloss
Nov 12/13	Laboratory	Enzymes – Kinetics and Inhibition	Demonstrate competence in measuring the kinetic parameters for an enzyme-catalyzed reaction and its inhibition (1,10)	Train/Schloss
Nov 19/20	Laboratory	Metabolomics	Demonstrate competence in conducting a model metabolic transformation, then following this reaction by LC-MS/MS (1,10,24,35)	Train/Schloss
Nov 26/27	Holiday	Thanksgiving		
Dec 3/4	Laboratory	Pharmacokinetics	Demonstrate competence in fitting equations to model data for pharmacokinetics (1,10,24,35)	Train/Schloss

Course Evaluation (assessment):

Student Evaluation:

Survey: each student will have the opportunity to evaluate the instructor as well as course content via an anonymous assessment at the end of the course.

Course Evaluation (grading):

There will be weekly practical exams to assess the techniques learned in the course. In addition to the laboratory exercises, there will be short (15 minute) presentations covering the theory and associated material with laboratory exercises. Weekly quizzes will be used to assess comprehension of the didactic portion associated with the laboratory. There will also be a comprehensive final covering all laboratories. To obtain an 'A' in the course, a composite score of 89.50% on laboratory write-ups and quizzes, together with a score of 89.50% or higher on the final examination will be required. The final examination will not jeopardize the grade of any student entitled to a B or C, based on the letter grade distribution, as defined below. If the average of the percentage for laboratory write-ups and quizzes, together with the percentage on the final exam, results in a higher score, the student will be entitled to the higher grade appropriate for the average.

Point or Percentage Distribution:

Laboratory write-ups	50%
Quizzes	50%
Total (L+Q)	100%

Final Exam (FE)	100%
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Letter grades distribution:	A = 89.50 to 100% = A	both (L+Q) and FE
	B = 79.50 to less than 89.50%	(L+Q) or $[(L+Q)+FE]/2$
	C = 69.50 to less than 79.50%	(L+Q) or $[(L+Q)+FE]/2$
	F = Less than 69.50%	(L+Q) or $[(L+Q)+FE]/2$

Assignment and examination grades will be posted in Blackboard within 7 days unless otherwise stated.

Attendance policy: *Instructor added – example: Each student is required to attend class. Attendance is mandatory at graded events. Only excused absences accepted – see university and school policies.*

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 expectations for academic, ethical, and professional conduct are defined within the school's [Ethical and Professional Conduct Policy](#) and the university's [Academic Dishonesty Policy](#).

Second Chance and Remediation Policy

Second chance and remediation are mechanisms designed to assist students who have struggled within the classroom environment in demonstrating achievement of classroom and curricular learning outcomes. These processes are described in sections 200.001.003 (Second Chance) and 200.001.004 (Remediation) of the [Academic Standards for Grading, Progressions, Dismissal, and Re-admission Policy](#).

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 quiz/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 quizzes/exams are to be retained by the faculty.
- G. Faculty have the right to place further restrictions on test review as deemed necessary.