The University of Michigan College of Pharmacy

Pharmacy 476
Principles of Research and Problem Solving

Winter 2011

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A. P476 Instructional Staff

Kathleen A. Stringer, PharmD
Associate Professor of Clinical Pharmacy
Course Director

Helen Tamer, PharmD
Clinical Assistant Professor of Pharmacy

Justin Gatwood
Graduate Student Instructor (GSI)

Kefeng Sun
Graduate Student Instructor (GSI)

Dominique Lauten (P4 student, teaching assistant)

B. Course Information

Course Website: https://ctools.umich.edu or you can enter through the College of Pharmacy homepage. P476 course information is provided via CTools. Please do not use the website to communicate with the course director or instructors regarding personal matters, e.g., sickness, absence from exam, etc. In these cases, please call or email the course director/instructor or the Clinical Sciences Department. Do not use the website chat room to communicate with other students.

C. Course Schedule

Pharmacy 476
Winter 2011 Class Schedule

DAY	DATE	TIME	TOPIC	Lecturer	Student Group(s)	Room Number
Thu	1/6/11	1:30-3:00	course overview/ assignments/expectations Reviewing the Literature and Formulating a Research Problem	Stringer & MacEachern	All	1544 CCL
Mon	1/10/11	1:30-3:00				
Thu	1/13/11	1:30-3:00	Faculty & Student Presentations	Stringer, Colleagues and P4 students	All	1544 CCL
Mon	1/17/11		**Martin Luther King Day- no class**			
Thu	1/20/11	1:30-3:00	How to Write an Introduction and Construct a Hypothesis	Stringer	All	1544 CCL
Mon	1/24/11	1:30-3:00	Group Session-Assignment #1	Tamer	A	1509 CCL
Mon	1/24/11	1:30-3:00	Group Session-Assignment #1	Sun	B	1509 CCL
Thu	1/27/11	1:30-3:00	Group Session-Assignment #1	Gatwood	C	1567 CCL
Thu	1/27/11	1:30-3:00	Group Session-Assignment #1	Stringer	D	B022
Mon	1/31/11	1:30-3:00	How to write specific aims	Stringer	All	1544 CCL
Thu	2/3/11	1:30-3:00	Group Session-Assignment #2	Tamer	A	1567 CCL
Thu	2/3/11	1:30-3:00	Group Session-Assignment #2	Sun	B	B022
Mon	2/7/11	1:30-3:00	Group Session-Assignment #2	Gatwood	C	1509 CCL
Mon	2/7/11	1:30-3:00	Group Session-Assignment #2	Stringer	D	1509 CCL
Thu	2/10/11	1:30-3:00	How to select a study design	Stringer	All	1544 CCL
Mon	2/14/11	1:30-3:00	Outcome measures, variables, and data	Stringer	All	1544 CCL

DAY	DATE	TIME	TOPIC	Lecturer	Student Group(s)	Room Number
Thu	2/17/11	1:30-3:00	Group Session- Assignment #3	Sun	B	B022
Mon	2/21/11	1:30-3:00	Group Session- Assignment #3	Gatwood	C	1509 CCL
Mon	2/21/11	1:30-3:00	Group Session- Assignment #3	Stringer	D	1509 CCL
Thu	2/24/11	1:30-3:00	How to develop a statistical plan	TBD	All	1544 CCL
Mon	2/28/11		**SPRING BREAK- no class**			
Thu	3/3/11		**SPRING BREAK- no class**			
Mon	3/7/11	1:30-3:00	Human Subjects	Tamer	All	1544 CCL
Thu	3/10/11	1:30-3:00	Vertebrate Animals	Stringer	All	1544 CCL
Mon	3/14/11	1:30-3:00	Group Session- Assignment #4	Tamer	A	1509 CCL
Mon	3/14/11	1:30-3:00	Group Session- Assignment #4	Gatwood	C	1509 CCL
Thu	3/17/11	1:30-3:00	Group Session- Assignment #4	Sun	B	1567 CCL
Thu	3/17/11	1:30-3:00	Group Session- Assignment #4	Stringer	D	B022
Mon	3/21/11	1:30-3:00	Limitations, Problems, Conclusions and Future Direction	Stringer	All	1544 CCL
Thu	3/24/11	1:30-3:00	How to write a structured abstract	Stringer	All	1544 CCL
Mon	3/28/11	1:30-3:00	How to give a great poster presentation	Sun/Gatwood	All	1544 CCL
Thu	3/31/11	1:30-3:00	Group Session- Assignment #5	Tamer	A	1567 CCL
Thu	3/31/11	1:30-3:00	Group Session- Assignment #5	Sun	B	B022 CCL
Mon	4/4/11	1:30-3:00	Group Session- Assignment #5	Gatwood	C	1509 CCL
Mon	4/4/11	1:30-3:00	Group Session- Assignment #5	Stringer	D	1509 CCL
Thu	4/8/11	1:30-3:00	Group Session- Assignment #6	Tamer	A	1567 CCL
Thu	4/8/11	1:30-3:00	Group Session- Assignment #6	Sun	B	B022

DAY	DATE	TIME	TOPIC	Lecturer	Student Group(s)	Room Number
Mon	4/11/11	1:30-3:00	Group Session- Assignment #6	Gatwood	C	1509 CCL
Mon	4/11/11	1:30-3:00	Group Session- Assignment #6	Stringer	D	1509 CCL
Thu	4/14/11	1:30-3:00	Group Session- Assignment #7	Tamer	A	1567 CCL
Thu	4/14/11	1:30-3:00	Group Session- Assignment #7	Sun	B	B022
Mon	4/18/11	1:30-3:00	Group Session- Assignment #7	Gatwood	C	1509 CCL
Mon	4/18/11	1:30-3:00	Group Session- Assignment #7	Stringer	D	1509 CCL
Thu	4/21/11	4:00-6:00	Poster Session	Tamer/Sun/Gatwood/ Stringer	All	Palmer Commons

D. Course Description and Objectives

This is an introductory course in research methods and proposal writing. The course is desig give students experience in hypothesis and specific aims development and an overview of the the scientific study design for solving health-related problems. The governing principle of the is to provide students with an interactive "how to" learning experience during which they recei regular feedback on their work. The course objectives will be accomplished through didactic l and small group and individual assignments. Ultimately, each student will write a brief researc proposal that follows a similar format to the PharmD Investigation proposal. This will be accor through a series of individual assignments. In addition, students will present a research propo work accomplished through small group assignments to peers and College of Pharmacy facul poster session at the end of the semester.

Course Goals

The objectives of the course are to: (1) introduce the student to the components of a research proposal; (2) improve the student's understanding of a systematic approach to research and p solving; and (3) further develop the student's scientific writing and oral presentation skills in preparation for the PharmD Investigation proposal and PharmD seminar that are required in t and P4 years, respectively.

Course Objectives

At the completion of this course, students should be able to do/understand the following as th pertain to research methodology and proposal development:

1. Formulate a research problem that is relevant to human health.
2. Construct a hypothesis and understand how it relates to the research problem.
3. Write and verbally convey a logical hypothesis.
4. Develop specific aims to address a hypothesis.
5. Develop and explain, in written and verbal form, the needed background information to s the rationale for a hypothesis.
6. Select an appropriate study design (including methods and measurements/outcomes) to address a hypothesis.
7. Appreciate the importance of collaboration and consensus building in research project development and problem solving.
8. Convey and convince, in writing and verbally, the importance and significance of a chos research problem and develop a proposal to address the problem.
9. Understand the purpose for each component of a research proposal.
10. Construct a scientific poster for presentation of a research proposal.
11. Present a research proposal in a concise manner as a poster presentation

E. College of Pharmacy Ability Based Outcomes

This course addresses the University of Michigan's College of Pharmacy ability-based outcom

- 4.1 Systematically gather, analyze, and synthesize information using available metho research tools.
- 4.2 Integrate such information from diverse sources to draw conclusions that lead to th appropriate course of action in a given situation.
- 4.3 Instill an understanding of sound research principles and participate in scientific ef are ethical, evidence-based, logical and honest.

and fulfills components of proposed essential research curriculum content as proposed by the American College of Clinical Pharmacy (ACCP).

F. Class Expectations

Expectations and Responsibilities of Students in P476:

Dr. Stringer is the course director. Drs. Stringer and Tamer teach the course with the assistance of two GSIs. The GSIs will participate in the teaching and oversight of the course including the evaluation of written and oral work. A P4 student serves as a teaching assistant but will not be involved in the evaluation of student work. Students enrolled in the course are expected to attend lectures, remain non-disruptive during the class time and actively participate in discussion/small group sessions. Specific expectations are outlined below:

- Attendance - students are expected to attend class unless there is an illness or an unforeseen event. **Important information about assignments will be disseminated in class.** Interactive, small group discussions and projects are an important component of this course. Group assignments will be made and groups will be required to present updates of their group project during these small group sessions. Attendance will be taken and is also a component of peer assessment (see grading policy and rubrics).

- Academic integrity - students are expected to abide by the **College of Pharmacy Code of Conduct** as it relates to all aspects of academic integrity. Please be particularly mindful of work that is individual and is expected to be independent of that generated by the group.

- Professionalism - students are expected to abide by the **College of Pharmacy Code of Conduct** as it relates to all aspects of professionalism. This includes acting in a professional manner at all times during class, being on time for class, and refraining from talking and other disruptive behaviors during class. Students who demonstrate disruptive behavior may be asked to leave class.

- Cell Phones/Pagers**:** Please turn off your cell phone and/or pager before entering class.

- Headphones: Headphones are not permitted to be worn/used during class.

- Interactive teaching/learning - classes include an interactive component that requires student participation in pre-assigned small groups.

- Audiotaping/video taping/photography policy- students may audiotape lecture if they obtain the verbal permission of the involved faculty member and that they understand that the audiotape(s) are for use by an individual student only. Permission to audiotape must be obtained from the instructor prior to taping. If granted, the student will be permitted to tape all lectures for that specific instructor within this course. Audiotapes are not to be placed on a website, shared with classmates or other students, or distributed in any manner or format. An exception to this will be made when a student is audiotaping for a student who cannot attend class. In this instance, the student who is taping must inform the instructor that he/she is taping for another student. However, videotaping and photography during lecture IS NOT permitted. In addition, audiotaping/videotaping and/or photography of group sessions/ assignments IS NOT permitted.

- Syllabus - students are expected to purchase a copy of the course syllabus and to bring the pertinent portions to class. It will also be available on CTools.

- Homework - students are expected to complete all homework assignments by the assigned deadline as directed by course faculty and GSIs.

- Course website/email - students are expected to utilize the course website on CTools to obtain course-related information. The course website (including the chat room) should NOT be used for any other purpose. Students are expected to routinely view their email as faculty announcements and messages may also be sent in this manner. Email etiquette is expected of all students when communicating with faculty and other students in this course.

- Special needs - students with special needs are required to communicate with the Course Director about special needs before classes begin.

- Questions/concerns - Questions or concerns such as absence, illness, course logistics or other problems that the student may have in the course should be directed to the course director.

Class Participation

P476 is taught in an interactive learning style that combines lecture and small group activities. Students are expected to come to class and to actively participate in the group sessions and assignments.

Required Readings, References, Resources, Computer Requirements

There are no ***required*** readings for the course. However, students are ***required*** to seek and identify reliable information for their individual and group assignments. In some cases, resources will be provided in class and others will be provided through CTools. Students will be expected to use other resources such as PubMed and other reliable sources of information to complete the assignments.

Recommended Text (one copy is on reserve at Taubman):
Research Methodology: A Step-by-Step Guide for Beginners (Paperback, 2nd edition)
by Ranjit Kumar (Author).

Also, on reserve at Taubman: Introduction to Research in the Health Sciences. Stephan Polgar and Shane A. Thomas, 5th Edition

1. Lecture notes/handouts may be provided or will be available on CTools or at Dollar Bill copy services.

2. For group assignments, it will be ideal if one member of the group has a laptop computer. If this presents a problem, please notify Dr. Stringer.

G. Examinations, Assignments and Grading

There are no examinations in this course. However, there are a series of written independent assignments with specific deadlines. **Independent assignments are intended to be completed individually (without collaboration or consultation with your peers, faculty, or co-workers) per the honor code.** Please carefully review the assignments and the respective due dates. There are also small group assignments. This work will be done outside of class but will be presented by group members in class. Please see the "assignments" section and schedule of the syllabus for more detail.

In addition to the assignments described in the syllabus, all students must complete the biomedical and health sciences modules of Program for Education and Evaluation in

Responsible Research and Scholarship (PEERRS) (http://my.research.umich.edu/peerrs/). The modules can be done at any time but need to be completed by the end of the semester. There is a link to the web site via the P476 CTools site.

GRADING POLICY

There are several individual assignments and a group assignment during the semester including a final research proposal and poster presentation. The final product of the individual assignments is a referenced research proposal. The final product of the group assignments is a poster that will be presented by each student from each group at a poster session at the end of the semester. There are no exams. **Rubrics have been developed for grading and also serve as guides for essential elements of each assignment.** The rubrics for the individual assignments are posted on **CTools**.

The final grade for this course will be determined by the following components (total 405 points):

- **Individual Assignments** (80 points; ~20% of the final grade): There are four individual assignments with specific due dates. These assignments should be submitted via CTools.

- **Group assignments** will be completed outside of class and presented in a small group format at the group sessions. You will not be graded on these presentations but your attendance is worth 10 points (70 points; ~17% of the final grade).
- **Poster** (65 points; 16% of the final grade): Each **group** will be responsible for preparing a poster. The poster will be used by each member of the group for the presentation of the group's research idea to other groups in the class and faculty at the end of the semester at a poster session.
    - Content/appearance/organization ~31%
    - Individual student's presentation ~69%
- **Poster session attendance** (30 points; 7.4% of the final grade): You will be required to attend the poster session in order to present your poster and to serve as a student evaluator. Your attendance will be measured by the submission of your evaluations of the posters you are assigned to review.
- **Final paper** (160 points; 39.5% of the final grade): Each **student** will be responsible for submitting a final research proposal. The final paper is due on **April 19th, 2011**.

Percentages will be converted into letter grades according to the following scale*:

93-100%	A	83-86%	B	73-76%	C	63-66%	D
90-92%	A-	80-82%	B-	70-72%	C-	60-62%	D-
87-89%	B+	77-79%	C+	67-69%	D+	<60%	E

*per COP policy, the minimum passing score is 70%.

ASSIGNMENTS

First assignment: organize yourselves into groups of at least three but no more than four. Email your group members names to Dr. Stringer (stringek@umich.edu) by FRIDAY, JANUARY 14th.

INDIVIDUAL ASSIGNMENTS

#	Assignment	Suggested Reading†	Due Date
1	Formulate a research problem statement	Chapter 4 p. 39-53	1/14/11
2	Write an introduction section, a hypothesis, and 2-4 specific aims to test the hypothesis	Chapters 3 & 6 p.29-38; 72-79	2/11/11
3	Develop a study design and statistical plan and address issues related to the use of human subjects or vertebrate animals	Chapters 5, 9, 12, 14 p. 54-71; 117-142; 161-184; 207-216; Chapter 8 p. 92-113; Chapter 13 p. 185-205	3/11/11
4	Conclusion, limitations, and future directions and a structured abstract of your proposal		4/1/11
Final	submission of final proposal including references and key words		4/19/11

*independent assignments are to be submitted to the P476 CTools.
† suggested readings pertain to chapters and page numbers from the recommended text (Research Methodology: A Step-by-Step Guide for Beginners (Paperback, 2nd edition) by Ranjit Kumar.

GROUP ASSIGNMENTS

#	Assignment	Due Date
1	Formulate and present group research problem	1/24-1/27/11
2	Present poster title and introduction	2/3-2/7/11
3	Present hypothesis and specific aims	2/17-2/21/11
4	Present study design & statistical plan	3/14-3/17/11
5	Present conclusions, limitations and future directions	3/31-4/4/11
6	Final poster review & edits; abstract due	4/8-4/11/11
7	Practice poster presentation*	4/14-4/18/11
Poster Session	Final Poster Presentation by each member of each group	4/21/11 4-6pm in Palmer Commons

*posters will be graded for content and appearance (see poster content rubric)

Assignment Specifics

Independent (individual) Assignments: These assignments are to be done on your own and *must* represent your own work (honor code applies). Important information about each assignment will be given in class (so attendance IS important). The instructions and rubric for each assignment is provided on CTools. All independent assignments must be submitted via CTools (using assignments) on the due date. Late work will not be accepted.

The **final paper** has its own rubric (as more detail is required in it than in the independent assignments) and will include a bibliography that you will generate using RefWorks. Be sure to use this rubric for your final paper (CTools). The final proposal will be submitted as a MSWord document via CTools (using assignments).

Group vs. independent work: please be cognizant of the differences in work that constitutes group assignments and that which constitutes individual assignments. Don't hesitate to ask for clarification

Group Assignments: You will complete these assignments by working together in your groups. The final product of this work is a poster that each member of the group will present at a poster session at the end of the semester. To create your poster you will use a Powerpoint template that will be loaded on a jump drive. Bring the jump drive to each group session. The primary purpose of the group session is to get feedback about your work so that you can improve it and prepare for your poster presentation at the end of the semester.

Each assignment needs to be completed in advance of the group session. Each group is expected to come prepared to present their assignment at the group session. Assignments are as follows:

Group Assignment #	
1	**Present group research problem**. It must be drug, pharmacy, or health related and something that interests you. Keep in mind that it has to be a topic that you can concisely present. It has to be unique to the group- it cannot be similar to that of a group member's research problem used for the written proposal assignment.
2	**Present poster title and introduction**.
3	**Present hypothesis and specific aims.** Write 2-4 specific aims that will test your hypothesis.
4	**Present study design and statistical plan**. Write a study design that you will use to accomplish your specific aims and a statistical plan to analyze your data.
5	**Present conclusions, limitations, future directions**. Summarize your expected findings, the limitations of your study and what steps you anticipate taking next. **Your poster should be in its near final form.**
6	**Final poster review and edits; structured abstract.** Each group will present a final overview of their proposed project and poster. This is the last session before the practice session; all final edits should be incorporated by the end of this session. Each group is expected to submit a structured abstract of their poster for inclusion in the poster session program. **This is due by midnight on April 11th, 2011** and should be submitted via CTools**.**

7	**Practice poster presentation.** This is the final rehearsal! Posters should be in their final form and ready for printing. Group leaders will grade poster content (see rubric) and give final poster approval for printing at this session.

Poster presentation at the Poster Session 4/21/11: Each student from each group will give a poster presentation to a group of peer students and faculty (a poster presentation schedule will be forthcoming). Presenting students will be graded individually on their presentation by faculty (see rubric on CTools) and also will receive feedback from fellow students (ungraded). In addition to presenting, students will be expected to attend the poster sessions to serve as a poster evaluator.

Final research proposal: Each student is required to submit a final research proposal that represents the compilation of the independent assignments with the addition of a bibliography. The final proposal should reflect comments and suggestions of the faculty or GSI reviewer over the course of the semester. The bibliography should be generated through RefWorks (see CTools). **The final proposal is due on April 19th, 2011**.

LATE WORK WILL NOT BE ACCEPTED.

H. Handouts

A handout for each lecture is provided as part of the syllabus and will also be posted on CTools. Handouts will not necessarily include all the material that will be covered for each given lecture or precisely follow the lecture format. Final lecture slide sets will be posted on CTools following presentation.