

PHARMACOLOGY AND THERAPEUTICS
Tufts University Experimental College
Fall Semester 2018

Course Description

This course will introduce students to the science of pharmacology; the study of the manner in which the human body is affected by chemical agents. More importantly, the course will encourage students to explore the field of pharmacotherapeutics; the use of drugs to prevent and treat disease. This exploration will be student-directed.

By applying the principles of problem-based learning (PBL) students, and the faculty member serving as facilitator, will use carefully constructed patient scenarios to uncover opportunities for acquiring new knowledge. The patient scenarios (the problems) are created to encourage the students and the facilitator to co-construct the instructional agenda. This approach maximizes student-centered education while working toward global learning goals. The faculty member will guide the learning process rather than provide all of the information.

The PBL process will be divided into five steps: (1) encountering the problem; (2) identifying learning needs in an interactive group process; (3) engaging in self-study; (4) applying newly gained knowledge to the problem; and (5) summarizing what was learned. Each week students will receive a new patient scenario. The case will be read aloud and a scribe will organize the group's thoughts on a white board for all to see. Information will be placed into one of four categories on the board (i.e., 'what we know', 'what we want to know', 'hypotheses', and 'learning questions'). Discussion of the case and identification of learning questions will continue until further progress in understanding the problem is impeded by the group's lack of knowledge. Then, a maximum of six students will choose a learning question to study before the next meeting. Before the end of the session, the group will discuss potential resources that may be used during individual research. (Note: every student in the class will research at least 3 topics during the semester). To begin the next meeting, students will share what they learned from their research. Each student will summarize their findings in a 5-8 minute presentation followed by a few minutes for questions and commentary. At the end of the case, and before the next problem is presented, participants will openly reflect on the lessons learned and the effectiveness of the group and the facilitator.

Course Faculty

Frank Massaro, PharmD
Director of Pharmacy
Tufts Medical Center

Assistant Professor of Medicine
Tufts University School of Medicine

Preferred email: fmassaro@tuftsmedicalcenter.org

Voice mail: 676-636-8983

Office Hours: by appointment

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Course Goals and Objectives

The goal of the ExCollege course in pharmacology and therapeutics is to help students to think critically, communicate effectively, and collaborate productively with their peer group while exploring the science of basic and clinical pharmacology.

Learning Objectives

1. The student will demonstrate the ability to direct their own learning by independently identifying creative, focused and manageable pharmacology and therapeutics topics for exploration.
2. The student will demonstrate the ability to research basic science and clinical questions by effectively using a variety of appropriate information resources.
3. The student will demonstrate the ability to present information to a group of peers and to teach effectively.
4. The student will demonstrate the ability to contribute actively and collaboratively as a member of a community of scholars by engaging their peers in ways that facilitate learning.

Course Schedule

Session	Date	Topics for Discussion	Problem for exploration
1		Basic Principles: Pharmacokinetics and Pharmacodynamics	John Gormley, a 19-year old with difficulty breathing
2		To be determined through exploration of a patient case.	Ryan Brown, a 62-year old complaining of chest pressure
3		To be determined through exploration of a patient case.	Maria Hernandez, an 85-year old admitted to the hospital with palpitations and dizziness
4		To be determined through exploration of a patient case. Take-home Problem # 1 response due at or before 4 PM.	David Sasso, a 46-year old man with a cough and fever
5		To be determined through exploration of a patient case.	Margaret Sullivan, a 79-year old female with Parkinson's Disease
6		To be determined through exploration of a patient case.	Melissa Cooper, a 21-year old college student with abdominal cramps and diarrhea
7		To be determined through exploration of a patient case.	John Doe, a 62-year old man with a history of ethanol abuse
8		To be determined through exploration of a patient case.	A middle-aged man with a seizure disorder
9		To be determined through exploration of a patient case.	Charlie Thompson, a six-year old boy with a sore throat
10		To be determined through exploration of a patient case.	Ryan Brown suffers a cardiac arrest

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Course Schedule (continued)

Session	Date	Topics for Discussion	Problem for exploration
11		To be determined through exploration of a patient case.	Alyssa Lee, a 21-year old nursing student just does not want to get out of bed
		No Class	
12		To be determined through exploration of a patient case.	Mickey Shannon, a 72-year old retired fire fighter has trouble walking because his feet are swollen
13		Final presentations	Course summary and evaluation

Expectations

This course is rooted in the principles of problem-based learning. As such, it is necessary that every student participate in creating the instructional agenda. That is, students must identify opportunities for learning, research answers to the questions posed, and teach one another. Attendance and class participation are very important and will be considered in the final grading.

Students are expected to be punctual and attend all classes for the entire class period. Students are expected to behave in a manner that maintains an environment conducive of learning and teaching. Cell phones must be in silent mode during class. Students should expect that the faculty member will always abide by these rules.

Students should expect to make at least three 5-8 minute oral presentations to the class during the course of the semester. Presentations will be evaluated using the rubric found in Appendix A. Students should also expect to receive feedback from classmates and the facilitator during class.

Students should expect to explore one carefully constructed 'problem' outside of class (i.e., one take-home case). Take-home problem responses will be evaluated using the rubric found in Appendix A.

The final course grade will be determined using the scheme found in Appendix B.

All assignments are due on the day and the time listed in the course schedule. Make-up assignments and late assessments will be considered only in special circumstances.

Students should expect to provide oral and written feedback about the course structure and content throughout the semester.

Students with Disabilities

Tufts University values the diversity of our students, staff, and faculty, recognizing the important contribution each student makes to our unique community. Students with disabilities are assured that the Student Accessibility Services office will work with each student individually to ensure access to all

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aspects to student life. Tufts is committed to providing equal access and support to all students through the provision of reasonable accommodations so that each student may access their curricula and achieve their personal and academic potential. If you have a disability that requires reasonable accommodations, please contact the Student Accessibility Services office at 617-627-4539, or through their email at Accessibility@tufts.edu, to make an appointment with the director to determine appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

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Appendix A: Student Evaluation

Pharmacology and Therapeutics

Student: _____

Date: _____

10	8.5	7.5	6.5
<p>Critical Thinking: Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion. https://aacu.org/value/rubrics/critical-thinking. Accessed June 8, 2015</p>			
<input type="checkbox"/> Issue to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding	<input type="checkbox"/> Issue to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions	<input type="checkbox"/> Issue to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown	<input type="checkbox"/> Issue to be considered critically is stated without clarification or description
<input type="checkbox"/> Information is taken from sources with enough interpretation to develop a comprehensive analysis or synthesis	<input type="checkbox"/> Information is taken from sources with enough interpretation to develop a coherent analysis or synthesis	<input type="checkbox"/> Information is taken from sources with some interpretation but not enough to develop a coherent analysis or synthesis	<input type="checkbox"/> Information is taken from sources without any interpretation
<p>Inquiry and Analysis: Inquiry is a systematic process of exploring issues through the collection and analysis of evidence that results in informed conclusions. Analysis is the process of breaking complex topics or issues into parts to gain a better understanding. https://aacu.org/value/rubrics/inquiry-analysis. Accessed June 8, 2015</p>			
<input type="checkbox"/> Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously unexplored aspects of the topic	<input type="checkbox"/> Identifies a focused and manageable topic that appropriately addresses relevant aspects of the topic	<input type="checkbox"/> Identifies a topic that while manageable, is too narrowly focused and leaves out relevant aspects of the topic	<input type="checkbox"/> Identifies a topic that is far too general and wide-ranging as to be manageable
<input type="checkbox"/> Organizes and applies evidence to reveal insightful patterns, differences, or similarities related to focus	<input type="checkbox"/> Organizes evidence to reveal important patterns, differences, or similarities related to focus	<input type="checkbox"/> Organizes evidence, but the organization is not effective in revealing important patterns, differences, or similarities	<input type="checkbox"/> Lists evidence, but is not organized and / or unrelated to focus
<p>Foundations and Skills for Lifelong Learning: Lifelong learning is all purposeful learning activities, undertaken on an ongoing basis with the aim of improving knowledge, skills and competence. https://aacu.org/value/rubrics/lifelong-learning. Accessed June 8, 2015</p>			
<input type="checkbox"/> Explores a topic in depth, yielding a rich awareness and insight of the information that indicates intense interest in the subject	<input type="checkbox"/> Explores a topic in depth, yielding insight of the information that indicates interest in the subject	<input type="checkbox"/> Explores a topic with some evidence of depth, providing occasional insight that indicates mild interest in the subject	<input type="checkbox"/> Explores a topic at a surface level, providing little insight and/or information beyond the very basic facts indicating low interest in the subject
<input type="checkbox"/> Makes explicit reference to previous learning and applies that knowledge and those skills in new and creative ways to demonstrate comprehension and performance in novel situations	<input type="checkbox"/> Makes explicit reference to previous learning and shows evidence of applying that knowledge and those skills to demonstrate comprehension and performance in novel situations	<input type="checkbox"/> Makes reference to previous learning and attempts to apply that knowledge and those skills to demonstrate comprehension and performance in novel situations	<input type="checkbox"/> Makes vague reference to previous learning but does not apply knowledge and skills to demonstrate comprehension and performance in novel situations

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Information Literacy: The ability to know when there is a need for information, to be able to identify, locate, evaluate and responsibly use and share information for the problem at hand. https://aacu.org/value/rubrics/information-literacy. Accessed June 8, 2015			
<input type="checkbox"/> Effectively defines the scope of the research question. Effectively determines key concepts. Types of information (sources) selected directly relate to concepts or answer the research question.	<input type="checkbox"/> Defines the scope of the research question. Can determine key concepts. Type of information (sources) selected relates to concepts or answers research question.	<input type="checkbox"/> Defines the scope of the research question incompletely (parts are missing, remains too broad or too narrow, etc.). Can determine key concepts. The type of information selected partially relates to concepts or answers research question.	<input type="checkbox"/> Has difficulty defining the scope of the research question. Has difficulty determining key concepts. Types of information (sources) selected do not relate to concepts or answer research question.
<input type="checkbox"/> Accesses information using effective, well-designed search strategies and most appropriate information sources.	<input type="checkbox"/> Accesses information using a variety of search strategies and some relevant information sources. Demonstrates ability to refine search.	<input type="checkbox"/> Accesses information using simple search strategies retrieves information from limited and similar sources.	<input type="checkbox"/> Accesses information randomly, retrieves information that lacks relevance and quality.
Oral Communication: The student should be able to prepare a purposeful presentation designed to increase knowledge and to foster understanding in the listeners. https://aacu.org/value/rubrics/oral-communication. Accessed June 8, 2015			
<input type="checkbox"/> Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	<input type="checkbox"/> Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	<input type="checkbox"/> Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	<input type="checkbox"/> Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<input type="checkbox"/> Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	<input type="checkbox"/> Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	<input type="checkbox"/> Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	<input type="checkbox"/> Language is unclear and minimally supports the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<input type="checkbox"/> Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	<input type="checkbox"/> Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting and speaker appears comfortable.	<input type="checkbox"/> Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and the speaker appears tentative.	<input type="checkbox"/> Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speaker appears uncomfortable.
<input type="checkbox"/> A variety of types of supporting materials (examples, illustrations) make appropriate reference to information or analysis that significantly strengthens the presentation.	<input type="checkbox"/> Supporting materials (examples, illustrations) make appropriate reference to information or analysis that generally supports the presentation.	<input type="checkbox"/> Supporting materials (examples, illustrations) make appropriate reference to information or analysis that partially supports the presentation. bolster	<input type="checkbox"/> Insufficient supporting materials (examples, illustrations) make reference to information or analysis that minimally supports the presentation.
Teamwork: Teamwork constitute the behaviors under the control of individual team members (effort they put into team tasks, their manner of interacting with others on team, and the quantity and quality of contributions they make to team discussions. https://aacu.org/value/rubrics/teamwork Accessed June 8, 2015			
<input type="checkbox"/> Engages team members in ways that facilitate their contributions to meetings by both constructively building upon or synthesizing the contributions of others as well as noticing when someone is not participating and inviting	<input type="checkbox"/> Engages team members in ways that facilitate their contributions to meetings by both constructively building upon and synthesizing the contributions of others.	<input type="checkbox"/> Engages team members in ways that facilitate their contributions to meetings by restating the views of other team members and/or asking questions for clarification	<input type="checkbox"/> Engages team members by taking turns and listening to others without interrupting

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them to engage.			
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Appendix B. Grading Scheme

Activity	Rubric Elements Assessed (Maximum score)	Total Maximum Points	Contribution to Final Grade
In-class presentations x 3	<ul style="list-style-type: none"> • Critical Thinking (20 points) • Inquiry and Analysis (20 points) • Lifelong Learning (20 points) • Information Literacy (20 points) • Oral Communication (40 points) 	360	50%
Case Exploration / Class participation	<ul style="list-style-type: none"> • Critical Thinking (20 points) • Lifelong Learning (20 points) • Teamwork (10 points) 	50	35%
Take-home Case	<ul style="list-style-type: none"> • Critical Thinking (20 points) • Inquiry and Analysis (20 points) 	40	15%
		450	100%