

TITLE: NUR 8903 – Advanced Pharmacology
CREDITS: 3 (3 hours/week theory including online synchronous/asynchronous sessions)
DATE/TIME: Monday's 5-8 PM
PREREQUISITES: NUR 8901 (or permission of instructor)
INSTRUCTORS: Dr. Jerrod Hunter
Office G054, Mendel Science Center
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Office Hours: please by appointment; Zoom sessions are easy to schedule.

OVERVIEW: This course provides an intensive study of the principles of pharmacodynamics, pharmacokinetics, and pharmacotoxicology. Emphasis will be placed on the mechanisms of drug actions with a focus on how these effects results in the therapeutic and adverse effects of a drug. Determination of appropriate drug regimens for use in the treatment of disease states, as seen in special populations across the life span, will be reviewed. Consideration will also be given to specific problems in prescribing medications for special populations as well as the problems of multiple drug therapy. Cost, indication for use, action, dosage, common side effects, toxicity, and food/drug interaction will be reviewed for each drug category reviewed in this course. A reserved copy of this textbook can be found in Falvey Library. Both in-person and recorded (Mediasite) lectures will be used in this course. Please see scheduling details below. If public health conditions change, lecture material may be shifted to a distance learning modality. Students, faculty, and staff are required to follow the "Caritas Commitment" that has been developed by the University:
<https://www1.villanova.edu/university/return-to-campus/commitment.html>

OBJECTIVES:

1. Explain the principles of pharmacodynamics, pharmacokinetics, and pharmacotoxicology. Understand principles of pharmacogenomics.
2. Explain the action, common side effects, toxicity and significant food/drug interactions for the major categories of drugs.
3. Determine appropriate drug regimens for use in the treatment of various disease states across the life span seen in primary care.
4. Analyze specific considerations needed when prescribing drugs for special populations.
5. Provide appropriate education about pharmacologic agents to clients across the life span.

INTRODUCTION:

This course is designed to provide you with an in depth review of the principles in advanced pharmacology. Major concepts related to the pharmacokinetics, pharmacodynamics, and pharmacotoxicology will be reviewed. Questions about drugs that will be addressed include: "What are the physiological mechanisms by which drugs produce their therapeutic and toxic side-effects?"; "How does the general state of health, the route of administration, the age or emotional state of an individual influence drug responses?"; and "What are the causes/mechanisms of drug interactions?". The primary objective of this course is to develop an

in depth understanding of the biochemical and molecular mechanisms by which prototype drugs produce their effects. Understanding the actions of prototype drugs will provide the conceptual framework for understanding trade names drugs that belong to a specific class of medications. If you can use established principles in pharmacology to formulate proper strategies (arguments) for drug treatment, you will optimize the therapeutic benefits of drugs while at the same time minimizing their toxic potentials.

TEXTBOOK AND REFERENCE RESOURCES:

Lehne's Pharmacology for Nursing Care by Burchum and Rosenthal, Elsevier/Sanders, 10th edition, 2019 (ISBN 978-0-323-51227-5). I have adopted this textbook because it represents a comprehensive, yet focused survey of the principles of pharmacology. This book provides information about how and when a drug should be administered, their therapeutic uses, their side-effects, and drug interactions. It also reviews important information about patient-teaching guidelines. I like the clarity of writing and the emphasis on mechanisms of drug actions and nursing applications. Let me know what you think!

Drug Information Resources:

www.fda.gov: complete listing of all prescription drugs; recall and safety alerts; new drug approvals

www.pdr.net: Physician Desk Reference; contains full FDA-approved product labeling information; drug and disease information; patient education

<http://druginfo.nlm.nih.gov/drugportal/drugportal.jsp>: National Library of Medicine, National Institute of Health drug reference portal; extensive resource for specialized and patient-oriented information about all prescription medications; image display of pills; links to medline plus drugs; etc.

www.medicalletter.org: unbiased, critical evaluation of new drugs compared to older medications; reviews costs and alternative treatments; evaluates claims made by manufactures

www.nccam.nih.gov: National Center for Complementary and Alternative Medicine; site

contains information on herbal and dietary supplements

www.rxlist.com : contains lists of the most commonly used drugs; contains basic information found in commonly used drug reference resources; highly commercialized

www.clinicaltrials.gov : contains information about clinical trial study sites for new drug development; www.centerwatch.com has similar information plus medical alert services

Attendance

Attendance in lectures and discussions is required. Lectures will typically be given synchronously *in person*; video/camera on is required in class and during exams. In addition, exams will be given using Blackboard and will require Zoom. Thus a computer and reliable internet connection is essential for the course. Based on past experience, attending the lectures is crucial for the successful completion of this course. At the very least, regular attendance will ensure that you have been exposed to the material on the exams. But it is so much more! Evidence exists that success in courses is strongly linked to good attendance (a great example of "Evidence-Based Practice"!). An article on this strong link can be found at

<http://sites.arbor.edu/studentsuccess/files/2011/11/Class-attendance-article1.pdf>.

An excerpt from the concluding section:

- ❖ Research indicates that attendance is statistically significant in explaining class grade and overall performance of students.
- ❖ Students who miss class frequently significantly increase their odds of a poor grade in a given course.
- ❖ A case can be made that requiring attendance can be a successful means of improving the value added of any course.

Along the lines of the last bullet point, your attendance and participation in class discussions will enhance the value of the course for all involved, including me! The success of this course is in part dependent upon participation by all of us. Everyone has something to offer. In discussions, I am less concerned with your always having the "correct" answer (indeed if there even is one!) than with your willingness to explore the topic. For the discussions to go well, please read the assigned materials and look over any discussion questions distributed earlier in advance of class time.

Attendance at exams is especially crucial. **In order to be excused for a missed exam, inform me BEFORE the session or as soon as possible** (I may require a written explanation for the absence and, if requested, supportive evidence will be needed). Given the size of this course, it is difficult to schedule make-ups. Note that if the absence is not excused, you will receive a 0 on the exam.

The format of the make-up exams may be different from that of the regularly scheduled exams (e.g., entirely or partially essay questions and/or given orally).

Many students find it useful to print 2, 3, or 4 slides per page before lecture and then use these to take notes during lecture.

SPECIAL NOTE: Travel plans are not an acceptable excuse unless it is for a university-supported event (e.g., athletic competition). In such cases, a supporting letter will be required. Please consult the course schedule before making your travel plans for all breaks.

Additional services/policies

Office of Disabilities (ODS) and Learning Support Services (LSS)

It is the policy of Villanova to make reasonable academic accommodations for qualified individuals with disabilities. Students with disabilities who require reasonable academic accommodations should schedule an appointment to discuss specifics with me. Go to the Learning Support Services website (<http://learningsupportservices.villanova.edu>) for registration guidelines and instructions. For physical access or temporarily disabling conditions, please contact the Office of Disability Services at 610-519-4095 or email Stephen.McWilliams@villanova.edu. Registration is needed in order to receive accommodations.

Academic integrity statement with link

All students are expected to uphold Villanova's Academic Integrity Policy and Code. Any incident of academic dishonesty will be reported to the Dean of the College of Liberal Arts and Sciences for disciplinary action. For the College's statement on Academic Integrity, consult the [The CLAS Academic Handbook](#). You may view the university's Academic Integrity Policy and Code, as well as other useful information related to writing papers, at the Academic Integrity Gateway web site:

<https://library.villanova.edu/research/subject-guides/academicintegrity>

Absences for Religious Holidays

Villanova University makes every reasonable effort to allow members of the community to observe their religious holidays, consistent with the University's obligations, responsibilities, and policies. Students who expect to miss a class or assignment due to the observance of a religious holiday should discuss the matter with their professors as soon as possible, normally at least two weeks in advance. Absence from classes or examinations for religious reasons does not relieve students from responsibility for any part of the course work required during the absence.

<https://www1.villanova.edu/villanova/provost/resources/student/policies/religiousholidays.html>

Computers and Cell Phones in Class

As an online course, computers will of course serve a central role. I trust, however, that **you will use them responsibly!** Although I know it is tempting, please refrain from using them for on-line shopping/surfing, Facebook, Twitter, checking email, etc. Don't deceive yourself- such use can be very distracting to you! **Abundant research has proven that our capability to multitask effectively is a myth in most situations.** Moreover, **inappropriate use can be very distracting to your neighbors** and occasionally to me.

Cell phones should only be used for polls if at all.

Even though I recognize that each of you is responsible for your own learning, it becomes my concern if your behavior is distracting to or a negative influence on the learning environment for other students in any way. Thank you for paying attention to this.

COURSE SCHEDULE (APPROXIMATE!; See BlackBoard for actual recordings with dates):

Date Lecture Topic Reading Assignment*

Week 1	An introduction to the science of pharmacology	Chpt. 1-3
Week 2	Principles of Pharmacokinetics	Chpt. 4
Week 3	Pharmacodynamics; changes in the elderly and young; pharmacogenomics	Chpt. 8-11
Week 4	Pharmacodynamics, toxicology; antineoplastic drugs.	Chpt. 5-7 Chpt. 101-103
Week 5	EXAM I	
Week 5	Autonomic and neuromuscular pharmacology (readings)	Chpt. 12-13, 20
Week 6	Cholinergic and adrenergic pharmacology	Chpt. 14-16; 17-19
Week 7	Cardiovascular pharmacology; anti-hypertensives; diuretics; dysrhythmics	Chpt. 43, 47, 41, 44-45, 49
Week 8	Cardiovascular pharmacology; treatment of angina; myocardial infarctions, antihyperlipidemics	Chpt. 50-53
Week 9	EXAM 2	
Week 9	Respiratory and G-I pharmacology (readings)	Chpt. 76, 78
Week 10	Immunopharmacology and anti-inflammatory pharmacology; NSAIDs, antihistamines, and glucocorticoids	Chpt. 67, 70-72
Week 11	Immunosuppressants and modulators; vaccines	Chpt. 68-69
Week 12	Opioid and non-opioid analgesics anesthetics; and anti-migraine medications	Chpt. 26-30
Week 13	EXAM III	
Week 13	Antimicrobials: antibiotics, antiviral, antifungal drugs	Chpt. 83-89; 93-92
Week 14	Psychopharmacology; sedative-hypnotics, antidepressants, and anxiolytics	Chpt. 32-35
Week 15	Endocrine pharmacology; anti-diabetic drugs; osteoporosis; online material possible	Chpt. 57, 75
Week 16	Endocrine pharmacology; fertility and contraceptive pharmacology	Chpt. 61-63
Week 17	FINAL EXAM	

Specific pages from chapter assignments may be referenced to in PPT lectures. Selected reading assignments from internet sites or the primary literature will be announced in class.

