

Last name of instructor (Semester Year)

California State University, Sacramento

PHARMACOLOGY AND OTOTOXICITY

CSAD673 - 1 unit

Fall 2021 (AUD-3)

COURSE FACULTY

Course Instructor:

Folsom Hall office #:

Office Phone:

Office Hours:

E-mail address:

REQUIRED CLASS MEETINGS TIMES

No required meeting times. Class offered online.

REQUIRED TEXTS

Campbell, K.C. (2006). *Pharmacology and ototoxicity for audiologists*. Delmar Cengage Learning.

OPTIONAL TEXTS

COURSE WEBSITE

<https://sacct.csus.edu>

SacCT will be used as the learning management site for dissemination of course readings, handouts, slides, assignments, announcements, and quizzes. The course faculty will have materials posted to SacCT at least 48 hours before class.

Instructor Communication and Response Time

Faculty strive to have open communication with students both within and outside of the classroom. Students are encouraged to contact faculty to discuss questions about the course. Responses to telephone or e-mail messages will usually be transmitted within 48 hours during regular working hours. If you do not have a response within this time period, please check your contact methods and resend the message. Faculty will generally respond to student questions received during evenings and weekends once they are back in the office during regular business hours.

***Please be aware that all content for this course is the property of the course faculty who have created it and can only be used for this course. Those wishing to use the materials outside of this course must receive written permission from the author/creator.**

GENERAL COURSE INFORMATION

PRE-REQUISITES

Admission to Doctor of Audiology program; CSAD611, CSAD612, CSAD613, CSAD614, CSAD621, CSAD622, CSAD622L, CSAD623, CSAD624, CSAD631, CSAD632, CSAD641, CSAD641L, CSAD642, CSAD643, CSAD651, CSAD652, CSAD653, CSAD661, CSAD662

COURSE DESCRIPTION

Overview

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This web-based course introduces students to the fundamentals of pharmacology, pharmacokinetics, and pharmacodynamics. Students will learn about the mechanisms of various cochleotoxic and vestibulotoxic drugs, their effects on the auditory system, and the subsequent management of ototoxicity.

Approved Course Description (from CSUS Course Catalog)

Introduction to the basic concepts of pharmacology, including pharmacokinetics, polypharmacy, and ototoxicity (cochleotoxicity, vestibulotoxicity, and neurotoxicity), for audiologists. Overview of drug classifications, interactions, and regulations.

WHY IS THIS COURSE IMPORTANT?

This course is important because it introduces students to the mechanisms and effects of various drugs and medications that can cause hearing loss, tinnitus, and/or imbalance. Students should be aware of these drugs in order to identify patients who may experience changes to their hearing and to manage the resulting hearing loss in patients taking these medications in order to improve their quality of life.

UNIVERSITY LEARNING GOALS

	1 Disciplinary knowledge	2 Communication	3 Critical thinking/analysis	4 Information literacy	5 Professionalism	6 Intercultural/global perspectives	7 Research
Addressed by this course	X	X	X	X	X		X

GRADUATE LEARNER OUTCOMES

Mastery of each student-learning outcome listed below is indicated by a grade of B or better on each component of the corresponding measures listed in the table. Students are required to track their progress towards meeting each learning outcome and must make an appointment with the instructor for any grade equal to or less than a B. The instructor will suggest strategies to help you establish competence and knowledge in these areas.

Students should track their progress towards meeting each learning outcome by listing their grades on the table below over the course of the semester.

Upon completion of this course, students will be able to:

1. Define ototoxicity
2. Define pharmacodynamics and pharmacokinetics
3. Describe mechanisms of ototoxicity
4. State the definition, purpose, mechanism, characteristics, and potential ototoxic (cochleotoxic or vestibulotoxic) effects of various drug classes on the auditory and/or vestibular system
5. Describe the process for monitoring hearing thresholds in patients taking medications that are ototoxic

Graduate Learner Outcome	Component Indicating Competency	Grade(s) Received
1-5	Quiz (100%)	
4,5	Project (100%)	

COURSE/CLASS POLICIES

Course Format

Lecture

Class Assignments

The course grade will be based on completed quiz scores and the final project.

Project

Students will be assigned one class or subclass of drugs to design and develop an informational brochure about for clinical use and reference. The brochure should include the following sections: the name of the drug class, generic and manufacturer names, use of the drug, therapeutic use, common side effects, ototoxic and/or vesitbulotoxic effects, management of the ototoxic effects, and recommendations for monitoring.

Commitment to Integrity

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this class and also integrity in your behavior in and out of the classroom.

Sac State's Academic Honesty Policy & Procedures

"The principles of truth and honesty are recognized as fundamental to a community of scholars and teachers. California State University, Sacramento expects that both faculty and students will honor these principles, and in so doing, will protect the integrity of academic work and student grades." Read more about Sac State's Academic Honesty Policy & Procedures at the following website: <http://www.csus.edu/umannual/AcademicHonestyPolicyandProcedures.htm>

Definitions: At Sac State, "cheating is the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means."

"Plagiarism is a form of cheating. At Sac State, "plagiarism is the use of distinctive ideas or works belonging to another person without providing adequate acknowledgement of that person's contribution." *Source:* Sacramento State University Library

Note: Any form of academic dishonesty, including cheating and plagiarism, shall be reported to the office of student affairs.

Understand When You May Drop This Course

It is the student's responsibility to understand when he/she need to consider disenrolling from a course. Refer to the Sac State Course Schedule for dates and deadlines for registration. After this period, a serious and compelling reason is required to drop from the course. Serious and compelling reasons include: (a) documented and significant change in work hours, leaving student unable to attend class, or (b) documented and severe physical/mental illness/injury to the student or student's family. Under emergency/special circumstances, students may petition for an incomplete grade. An incomplete will only be assigned if there is a compelling extenuating circumstance. All incomplete course assignments must be completed in accordance with the department's policy.

Accommodations

Inform your instructor of any accommodations needed. If you have a documented disability and verification from the Office of Services to Students with Disabilities (SSWD), and wish to discuss academic accommodations, please contact your instructor as soon as possible. It is the student's responsibility to provide documentation of disability to SSWD and meet with a SSWD counselor to request special accommodation before classes start. SSWD is located in Lassen Hall 1008 and can be contacted by phone at [\(916\) 278-6955](tel:9162786955) (Voice) or [\(916\) 278-7239](tel:9162787239) (TDD only) or via email at sswd@csus.edu

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Course Requirement Grading

<u>Activity</u>	<u>Points Available</u>
Module quizzes (50 points each x 5)	250
Project	300
<u>TOTAL COURSE POINTS AVAILABLE</u>	550

Overall Percentage Needed

Note: A grade of "B" or higher is required to count toward the minimum number of units needed to advance to candidacy.

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

COURSE SCHEDULE OF LECTURE TOPICS AND EXAMS

<u>Date</u>	<u>Module Topic</u>	<u>Reading</u>	<u>End of Module Quiz</u>
	MODULE 1		
	What is ototoxicity?	Chapter 1	
	The FDA	Chapter 3	
	Pharmacology	Chapter 4	
	Pharmacokinetics	Chapter 2	
	Pharmacodynamics	Chapter 2	
	Review of anatomy and physiology	Chapter 7 Chapter 8	
Due by 9/10	Mechanisms of ototoxicity	Chapter 7	
	MODULE 2: Ototoxicity and hearing loss		Module 1 due
	Drugs commonly used in otologic care	Chapter 4	
	Classes and subclasses of drugs	Chapter 4	
	NSAIDs, aspirin Quinine	Chapter 13	
	Chemotherapeutics	Chapter 10	
	Antibiotics	Chapter 11	
	Antivirals, antifungals,	Christensen, L. A.,	

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	antituberculous	Morehouse, C. R., Powell, T. W., Alchediak, T., & Silio, M. (1998). Antiviral therapy in a child with pediatric human immunodeficiency virus (HIV): case study of audiologic findings. <i>Journal of the American Academy of Audiology</i> , 9, 292-298.	
	Diuretics	Chapter 12	
	Beta blockers	Al-Ghamdi, B. S., Rohra, D. K., Abuharb, G. A. I., Alkofide, H. A., AlRuwalli, N. S., Shoukri, M. M., & Cahusac, P. M. (2017). Use of beta blockers is associated with hearing loss. <i>International Journal of Audiology</i> , 1-8.	
	ACE inhibitors, anticonvulsants, anti-Parkinson's	Bisht, M., & Bist, S. S. (2011). Ototoxicity: the hidden menace. <i>Indian Journal of Otolaryngology and Head & Neck Surgery</i> , 63(3), 255-259.	
Due by 10/10	Immunosuppressants, antirheumatoid, anesthetics		
	Industrial chemicals and solvents	Chapter 14	
	Herbal supplements	Chapter 6 Huang, X., Whitworth, C. A., & Rybak, L. P. (2007). Ginkgo biloba extract (EGb 761) protects against cisplatin-induced ototoxicity in rats. <i>Otology & Neurotology</i> , 28(6), 828-833.	
	MODULE 3: Ototoxicity and tinnitus		Module 2 due
	Anti-depressants	Langguth, B., Landgrebe, M., Wittmann, M., Kleinjung, T., & Hajak, G. (2010). Persistent tinnitus induced by tricyclic antidepressants. <i>Journal of Psychopharmacology</i> , 24(8), 1273-1275.	

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	Antimigraine		
	Hypnotics		
	Antihistamines		
	Anti-arrhythmics		
	Calcium channel blockers		
Due by 11/10	MODULE 4: Vestibulotoxicity	Chapter 17 Chapter 18	Module 3 due
	Non-steroidals		
	Opioids	Shaw, K. A., Babu, K. M., & Hack, J. B. (2011). Methadone, another cause of opioid-associated hearing loss: a case report. <i>The Journal of emergency medicine</i> , 41(6), 635-639.	
	Dementia drugs, myorelaxants		
Due by 11/30	Antiemetics		
	MODULE 5: AUDIOLOGIC MONITORING		Module 4 due
	Case history	Chapter 16	
	High-frequency audiometry OAEs	Garinis, A. C., Keefe, D. H., Hunter, L. L., Fitzpatrick, D. F., Putterman, D. B., McMillan, G. P., ... & Feeney, M. P. (2017). Chirp-Evoked Otoacoustic Emissions and Middle Ear Absorbance for Monitoring Ototoxicity in Cystic Fibrosis Patients. <i>Ear and hearing</i> .	
	Noise exposure and ototoxicity		
	Otoprotective agents	Chapter 15 Spankovich, C., Lobarinas, E., Ding, D., Salvi, R., & Le Prell, C. G. (2016). Assessment of thermal treatment via irrigation of external ear to reduce cisplatin-induced hearing loss. <i>Hearing research</i> , 332, 55-60.	
	Adult/geriatric testing		
	Pediatric testing		
Due by 12/10	Monitoring programs	Brooks, B., & Knight, K. (2017). Ototoxicity monitoring in children treated with platinum	

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		chemotherapy. <i>International journal of audiology</i> , 1-7. Garinis, A. C., Kempf, A., Tharpe, A. M., Weitkamp, J. H., McEvoy, C., & Steyger, P. S. (2017). Monitoring neonates for ototoxicity. <i>International Journal of Audiology</i> , 1-8.	
	Future research	Chapter 21 Chapter 22	Module 5 due

Please note that dates, topics, and assignments are subject to change. In the event of a change, you will be given ample notification of the change.

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