ICOS-325/PHAR-588: Drugs, the Brain and Behavior - Fall 2018 -Tuesday & Thursday: 5:00-6:15pm, Med-Dent Building, NE403

Directors:

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Assistant Director:

Nahdia Jones

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Office Hours: By Appointment

I. Rationale

This course is designed for students with an interest in brain function and dys- (or altered) function, as well as brain pharmacology.

II. Course Aims and Objectives

Aims

To familiarize students with the science of the diseases and disorders that affect brain function and behavior, as well as the relevant pharmacology.

Specific Learning Objectives

By the end of this course, students will be able to:

- explain normal brain function, from the neural to the systems level, as it relates to specific diseases/disorders
- describe the mechanism of action of treatments for nervous system disorders
- describe the clinical presentations of nervous system diseases
- explain currently available neuroscientific research methods and their utility for answering a given scientific question
- discuss the value of pharmacology as both a tool to explore and a therapy to treat brain dysfunction
- offer a measured, knowledgeable critique of a scientific paper

III. Format and Procedures

This course meets twice a week. Classes will consist of lectures in which new material will be presented, sometimes followed by paper discussions in which students will lead a critical discussion of a paper.

As this is a survey-style course that covers a wide variety of topics and diseases from the perspectives of neuroscience and pharmacology, there is no required textbook. However, the following textbooks are recommended for students needing a more substantial background on the fundamentals of neuroscience, neurobiology, and neuropharmacology:

- <u>Physiology of Behavior (Carlson and Birkett)</u>
- Neurobiology: A Functional Approach (Striedter)
- <u>Neuroscience (Purves)</u>
- Molecular Neuropharmacology: A foundation for clinical neuroscience (Nestler, Hyman & Malenka)

IV. Course Requirements

1. Class attendance and participation policy: Attendance is <u>required</u> for exams and for your scheduled journal club presentation date. Although journal club presentations will occur after a lecture, students who are presenting are required to arrive to class before the start of the lecture. Failure to show up on time will result in a 50% reduction to your journal club presentation grade.

Performance on short daily quizzes (multiple choice format on Canvas) will account for 20% of your final grade. We will drop your four lowest quiz grades, including quizzes due to absences, with no questions asked. There is no make-up policy for quizzes, regardless of whether you were in attendance. Content covered in the previous lecture and material from the current day's journal club paper are all fair game for these closed-note quizzes.

2. Journal Clubs: To expose you to relevant scientific research and skills necessary to critically evaluate primary literature, journal club discussions will take place throughout the semester. For each discussion, a paper will be chosen by 1-2 students and must be related to a topic covered in class. Articles must also be from within the past five years and have 4-6 figures, not including tables. These students will be considered the "Journal Club Presenters" for that class. Presenters are expected to attend class on time and to be prepared to present during the second half of the class. Non-presenting class members are required to read the paper, answer questions about the paper on the quiz, and participate by explaining figures to the rest of the class. The journal club grade is determined by your presentation (100 pts possible; see rubric below), and performance on quiz questions related to the journal club paper will contribute to the daily quiz grade.

Expectations of Journal Club Presenters (100 pts possible):

- Send 3 primary journal articles to the DBB email <u>at least 2 weeks before your selected presentation date</u> to get one article approved
- Send your PowerPoint slides to the DBB email by 5pm on the day of your scheduled Journal Club
- Present the article context and background (rationale for studies and previous research)
- Describe key methods, particularly any new methods
- Have the results (i.e., the paper's figures) in your slides for the rest of the class to present
- Summarize main article conclusions
- Facilitate critical discussion of strengths, weaknesses, and future directions

Expectations of non-presenting students:

- Read and take notes on the paper ahead of time; attend journal club
- Present figures to the class and participate in discussion. We will call on students at random to present figures if needed.

3. Lecture Exams: Exams (midterms and final) may be short answer/essay format and all except for the final are administered during class periods. Content will focus on new material, but may also be cumulative, requiring integration of material presented on previous exams. Students needing additional time/resources should directly contact instructors and the Academic Resource Center.

4. Primary Literature Exams: These are take home exams that will test your comprehension of primary literature using excerpts from the main components of journal articles including abstract, introduction, methods, figures, results, and discussion sections. The skills for these exams will be acquired through preparation for and participation during journal club. Late primary literature exams will be accepted, with a 10% deduction for each day late. (i.e. exam earning 89% will be reduced to 79% for one day late, 69% for two days, etc.).

5. Final Paper: (Graduate Students Only: Paper = 100 pts, Outline = 15 pts). Students will write an openended <u>descriptive essay</u>, related to any dysfunction or disease discussed in class or a recent innovation or discovery (within the last 10 years) that has changed understanding and/or treatment of a dysfunction or disease. In this paper, students must take a strong stance on their topic and come to a specific conclusion based on thorough literature review (see rubric below). At least 10 primary sources are to be used that were not covered in class. This does not include review articles. As part of your grade, you must submit a preliminary outline for approval by 11:59pm on **November 15th**, including a thesis statement, and 1-page annotated outline of content that incorporates at least 3 primary sources. You are encouraged to discuss potential paper topics with your instructors prior to writing the paper outline and to submit your outline early. The full-length final paper is due by 11:59pm on **December 6th**. Late papers will be accepted, with a 10% deduction for each day late. (i.e. paper earning 89% will be reduced to 79% for one day late, 69% for two days, etc.).

Requirements: 8-10 pages, 1" margins, double-spaced, Arial or Times New Roman 12 pt font. In-text citations and bibliography should be formatted in either Journal of Neuroscience or American Psychological Association (APA) format. The bibliography is not included in the page limit. Grades will be determined based on the rubrics below. Papers must be submitted as a <u>Word document</u> via Canvas and will receive a Turnitin report. Reports that raise concern will result in a referral to the <u>Georgetown University Honor Council</u>.

Resources for Citing Articles:

- How to Cite Articles: <u>http://www.citationmachine.net/the-journal-of-neuroscience/cite-a-journal</u>
- Alternative: http://www.citethisforme.com/guides/the-journal-of-neuroscience/how-to-cite-a-journal

Georgetown Writing Center: We encourage you to take advantage of the resources offered by the Writing Center. Resources include general writing and editing help as well as specific resources for second language writers (<u>http://writingcenter.georgetown.edu/</u>).

****NOTE:** Make-up exams and rescheduling journal clubs are only available under extreme circumstances and with sufficient evidence (e.g. doctor's note). For JC, you are able to swap dates with a classmate, but you must notify the Directors and all deadlines will remain the same (i.e. sending article 2 weeks in advance).

V. Grading Procedures:

Un	dergrad Students (ICOS 325)		Grad Stud (PHARM 5	ents 88)
	15%	Midterm 1	10%	
	15%	Midterm 2	10%	
	20%	Final Examination	10%	
	20%	Journal Club	20%	
	10%	Primary Literature Exams	10%	
		Term Paper (+ outline)	20%	
	20%	Daily Quizzes	20%	
Grading Scale				
A = 94-100	B+ = 87-89	C+ = 77-79	D = 60-69	F = 59 and below
A- = 90-93	B = 84-86	C = 74-78		

****NOTE:** Undergraduates have the option to choose between the two grading schemes. By default, undergraduates will be graded based upon scheme A. However, if an undergraduate would prefer to follow scheme B, they must notify the DBB instructors and make this change known by **October 30th.** Also, please note that C+/C- distinctions do not exist for graduate students.

C- = 70-73

B- = 80-83

VI. Academic Integrity

Each student in this course is expected to abide by the Georgetown University Honor Pledge. Any work submitted by a student in this course for academic credit will be the student's own work. Any violation of the Honor Pledge will result in no credit for the given assignment and automatic reporting of the violation to the Honor Council.

VII. Instructional Continuity

In the event of inclement weather or university closure, this course will operate under the following instructional continuity plan:

- Lecture capture video(s) will be posted to the course Canvas page. Students will be responsible for viewing these videos, as their content will be eligible for inclusion in subsequent quizzes and exams. Students will also be responsible for posting any questions they have about these lectures to the Cavas discussion boards prior to the start of the next in-person lecture.
- A quiz will not be posted to Canvas during the regularly-scheduled class period, and this will not count towards a student's dropped quiz count.
- If university closure occurs during a class period containing a journal club presentation, the DBB instructors will contact the presenter to arrange an alternate date for the presentation. However, journal club slides will still be due by 5pm on the assigned date.
- All assignments due during a university closure will not receive an extension. This applies to primary literature exams, final paper and final paper outline submissions, and submitting papers/questions/responses for the journal clubs. Students are encouraged to plan ahead so that their submissions are complete and submitted on time, regardless of inclement weather.

VIII. Journal Club Presentation Grading Rubric

Background	Presents previous research on this topic (citing and explaining specific previous experiments) to explain experimental rationale.	
General Aims and Hypotheses	Explains the authors' general goals and provides directional hypotheses based on previous research.	/15
Methods	Explains any previously un-discussed methods clearly and demonstrates basic understanding of how they work.	/15
Interpretation &	Briefly discusses at least 2 strengths and 2 weaknesses with the methods, experimental design, etc.	/15
Conclusions	Explains the overall conclusions of the paper (beyond restating the results) and " big picture " importance.	
Future Directions &	Outlines three or more experiments that logically follow from this paper, or experiments that could fill in the gaps in this paper.	/10
Alternate Title	Include an alternate title (in your own words) that summarizes the main significance/impact of this paper. This title should be suitable for a lay audience.	
Knowledge	Demonstrates fluency and competence of the paper through answering questions and making educated guesses.	/5
Presentation Style	Presentation is clear and well-organized. Speaks loudly and confidently. Includes key figures in presentation. Facilitates and monitors discussion to stay focused and timely (25 min total).	/10
Handed in on Time	Turns in chosen article and two Canvas questions to instructors 1 week before the journal club.	/10
	Total	/100

IX. Term Paper Rubric

Category	Unacceptable	Acceptable	Good	Excellent	SCORE
	(Below	(Meets	(Occasionally	(Exceeds	
	Standards)	Standards)	Exceeds	Standards)	
			Standards)		
Introduction	Does not adequately	Conveys topic, but	Conveys topic and	Strong introduction of	/15
	subtopic(s) covered in	subtopic(s) covered	Clearly delineates	and terms. Clearly	
	the rest of the paper.	in the paper. General	subtopic(s) covered	delineates	
	Lacks clear or	thesis statement.	in the paper. General	subtopic(s) covered	
	statement.		thesis statement.	thesis statement.	
Focus &	Little or no logical	Some organization of	All material clearly	All material clearly	/25
Sequencing	organization of	material, which all relate to the topic and	related to topic and	related to topic and	
	and suptopics. Many	subtopic(s). Attempts	logically organized.	organization and	
	transitions are unclear	to provide a variety of	Clear and varied	integration between	
	or non-existent.	transitions.	transitions	subtopics. Strong	
			lineugneut	throughout.	
Support	Few sources	Sources generally	Sources well selected	Strong peer-reviewed	/20
	Supporting thesis.	peer-reviewed or	some research in	of thesis.	
	or unsubstantiated.	evidence-based.	support of thesis.		
Conclusion	Does not summarize	Review of key	Strong review of key	Strong review of key	/15
	to thesis statement.	integration with thesis	integration with thesis	integration with thesis	
	Does not discuss the	statement. Discusses	statement. Discusses	statement. Insightful	
	impact of researched	impact of research	impact of researched	discussion and	
	material on topic.	material on topic.	material on topic.	impact of researched	
				material on topic.	
Grammar &	Grammatical errors or	Very few grammatical	Grammatical errors or	The paper is free	/10
Mechanics	punctuation mistakes	punctuation mistakes	punctuation mistakes	errors and spelling	
	that substantially	that interfere with the	are rare and do not	and punctuation	
	detract from paper.	readability of the	detract from the	mistakes.	
Style &	Errors in APA style	Errors in APA style	Rare errors in APA	No errors in APA	/5
Communication	detract substantially	are noticeable.	style that do not	style. Use of	/0
	of informal	informal tone/word	paper. Use of	Writing is flowing and	
	tone/wording. Writing	choice. Writing has a	scholarly tone/style.	easy to follow.	
	is choppy with many	few awkward	Writing has minimal		
	unclear passages.	phrasings of unclear passages.	unclear passages.		
Citations and	Has < 3 primary	Has 3-5 primary	Has 6-9 primary	Has at least 10	/10
References	sources. Reference	sources. Two	sources. One	primary sources. All	
	detract significantly	citations are missing	is missing or	citations are correctly	
	from paper. Not in	or incorrectly written.	incorrectly written.	written and present.	
	APA format.	Several errors in APA	Mostly correct APA	APA format is correct	
		ionnat.	ionnat.	Total	/100
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X. Class Schedule

Date	Торіс	Lecturer
Thu Aug. 30 th	Introduction to the Nervous System	Cameron McKay
Tues Sept. 4th	Introduction to Pharmacology & Neurobiology	Evan Wicker
•		Cameron McKay & Breana
	How to read (and understand) a research paper	Downey
Thu Sept. 6 th	Journal Club 101: How to present a paper	Kevin Čook
Tues Sept. 11 th	Cognitive Development	Gabrielle-Ann Torre
Thu Sept. 13 th	Executive Function	Breana Downey
Tues Sept. 18th	Autism Spectrum Disorder	Cameron McKay
•	Intellectual and Developmental Disabilities	
Thu Sept. 20 th	Journal Club #1	Cameron McKay
Tues Sept. 25th	Comparative Neuroscience & Validity	Breana Downey & Evan Wicker
Thu Sept. 27 th	Homeostasis	Nahdia Jones & Evan Wicker
Tues Oct. 2 nd	EXAM 1	
Thu Oct. 4 th	Anxiety Disorders	Evan Wicker
	1st Primary Literature Exam Posted	
Tues Oct. 9 th	Major Depressive Disorder	Kevin Cook
	Journal Club #2	
Thu Oct. 11 ^m	Sleep Disorders	Safwan Hyder
	Journal Club #3	
Tues Ost 10th	1st Primary Literature Exam Due by 8pm	Andrew Creidell
Tues Oct. 16"	Drugs of Abuse and Addiction	Andrew Speidell
Thu Oct. 18"	Schizophrenia	
Tues Oct. 23 rd	Psychopathy	
Thu Oct. 25"	Social Benavior & Stress	Cat Elorette
Tuos Oct. 20th	2nd Phimary Literature Exam Posted	Srikanth Damora
Tues Oci. 30	Iournal Club #4	Shkahin Damera
	Undergrad: Last day to choose grading scheme	
Thu Nov 1 st	Nutrition & Obesity	Lava Rajan
	Journal Club #5	
	2nd Primary Literature Exam Due by 8pm	
Tues Nov. 6 th	Journal Club #6	
	Journal Club #7	
Thu Nov. 8 th	EXAM 2	
Tues Nov. 13 th	Writing and Peer Editing Workshop	DBB Instructors
	Journal Club #8	
Thu Nov. 15 th	Aging & Dementia	Hannah Waguespack
	Final Paper Outline Due by 11:59pm	
Tues Nov. 20 th	Glia & Gliomas	George Melchor
Thu Nov. 22 nd	Thanksgiving Break – NO CLASS	
Tues Nov. 27 th	Anatomy Lab	DBB Instructors
	3rd Primary Literature Exam Posted	
Thu Nov. 29 th	Prion Diseases	Nahdia Jones
	Journal Club #9	
Tues Dec. 4 th	HIV-Associated Neurocognitive Disorder	Erin Wenzel

	Journal Club #10 3rd Primary Literature Exam Due by 8pm	
Thu Dec. 6 th	Neuroethics Journal Club #11 Final Paper Due by 11:59pm	Cameron McKay
Fri Dec. 14 th 7:00pm – 9:00pm	EXAM 3	