

UNIVERSITY OF FLORIDA COLLEGE OF MEDICINE
DEPARTMENT OF NEUROSCIENCE
GMS 6757 INTRODUCTION TO ALZHEIMER'S DISEASE AND RELATED DEMENTIAS: CLINICAL AND
MECHANISTIC PRINCIPLES (2 credit hours)

Semester: FALL 2024

MBI 1st Floor Conference Room L1-101: TUESDAYS AND WEDNESDAYS 3 - 4 PM

Course Directors:

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Office Hours: Virtual by email or scheduled zoom

Preferred Course Communications: Email and Canvas

Prerequisites: Students are expected to be familiar with basic neuroscience knowledge, including Alzheimer's disease. For a refresher in basic concepts of Alzheimer's disease, there are several free online resources, such as:

<https://nba.uth.tmc.edu/neuroscience/m/s4/chapter10.html>

https://www.alz.org/national/documents/brochure_basicsofalz_low.pdf

<https://alz-journals.onlinelibrary.wiley.com/doi/10.1002/alz.13859>

<https://alz-journals.onlinelibrary.wiley.com/doi/10.1002/trc2.12465>

<https://www.nia.nih.gov/health/alzheimers-and-dementia>

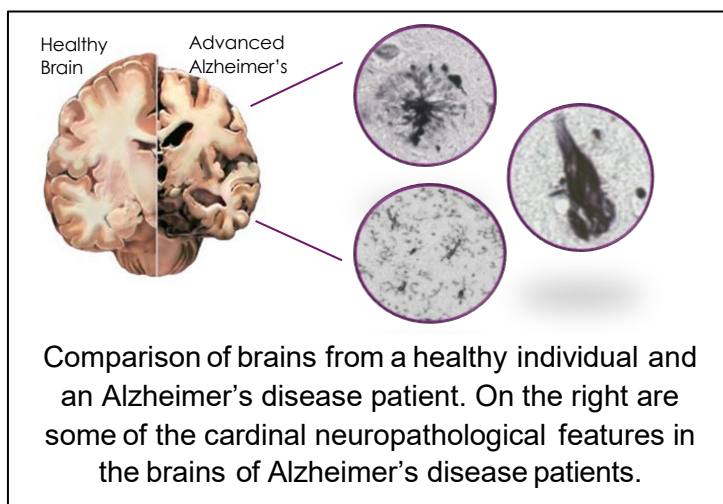
<https://adknowledgeportal.synapse.org/>

Course Overview: Alzheimer's disease (AD) is now the third leading cause of death among older adults in the United States, with current estimates exceeding 5 million affected individuals in the United States alone. Along with other related dementias (referred to as AD related dementias or ADRD), this group of diseases has an immense toll on the general health and well-being of our nation's aging population. Despite intensive preclinical research and multiple currently active clinical trials assessing potential treatments for ADRD, there are still no disease modifying therapies. The overarching theme of this class is to provide a comprehensive knowledge base to our next generation of trainee scientists in order to enable them to tackle the clinical and translational complexities presented by ADRD. This class, divided into two modules, incorporates a mix of didactic curriculum and discussion-based learning for graduate and professional students interested in a comprehensive overview of ADRD. The class covers specific themes that are designed to provide a comprehensive introduction to the topics most relevant to the study of ADRD. In addition to lectures, problem-based discussion and learning sessions are distributed throughout to offer deep analysis of key issues. These problem-based discussion sessions are specifically designed to promote broad discussion and maximize

interaction between student trainees and faculty experts on these topics. The classes will be taught using the chapters from two textbooks as cited below, as well as other relevant reading materials. These reading materials will be selected from the current primary literature relevant to the lecture theme. These articles will be assigned and distributed prior to the relevant lecture.

Course Objectives and/or Goals:

- 1) Develop an overview of clinical symptoms, disease symptoms, and diagnostic criteria including biomarkers for ADRD patients
- 2) Critically assess the implications of “Big Data” and obtain insights into Alzheimer’s risk genes, neurogenetics and gene-environment interactions as they relate to functional impairment in ADRD
- 3) Review the basic principles of drug design as it applies to ADRD preclinical research and clinical trials
- 4) Recognize and integrate the neuropathology of ADRD with basic neuroanatomical knowledge
- 5) Identify the various rodent and invertebrate models of ADRD and recognize the advantages and disadvantages of selecting experimental models
- 6) Identify basic concepts of cognitive dysfunction in aging and ADRD and appraise the characteristics in rodent models of ADRD
- 7) Participate in discussion-based learning to inculcate rigor, reproducibility transparency in experimental design in ADRD



Instructional Methods:

Instructional methods will include classroom teaching using powerpoints, classroom discussions, homework, active collaborative projects and a capstone project. Every topic will be disseminated by the instructors (Course Directors or Guest Lecturers) via didactic teaching methods. This will be followed by assignments, such as homework, group debates, group collaborative activities, research paper presentations and preparing a 1-page capstone project outline. A midterm exam will be used to set up benchmark goals.

Description of Course Content: Fall 2024 Course Schedule

Date	Topic	Lecturer
27-Aug	Clinical Features of ADRD	Breton Asken, PhD
28-Aug	Neuropsychology of ADRD and diagnostic guidelines	Dawn Bowers, PhD
3-Sep	Interactive thematic discussion learning session	Drs. Bowers, Breton, Abisambra, Chakrabarty
4-Sep	Multimodal biomarkers of ADRD	Breton Asken, PhD
10-Sep	Imaging biomarkers in ADRD	Marcelo Febo, PhD
11-Sep	Interactive thematic discussion learning session	Drs. Abisambra, Chakrabarty
17-Sep	Data science and systems biology in ADRD, Part I (DNA, RNA, Protein)	Paola Giusti-Rodriguez, PhD
18-Sep	Data science in systems biology in ADRD, Part II, (Database)	Sruti Rayaprolu, PhD
24-Sep	Interactive thematic discussion learning session	Drs. Giusti-Rodriguez, Rayaprolu, Abisambra, Chakrabarty
25-Sep	General principles of drug design	Jane Aldrich, PhD
1-Oct	Clinical trials in ADRD	Steven Dekosky, MD
2-Oct	Interactive thematic discussion learning session	Drs. Abisambra, Chakrabarty
8-9-Oct	SfN Conference	
15-Oct	Dissection of AD brain	Stefan Prokop, MD, Ben Giasson, PhD
16-Oct	Spectrum of neuropathology in ADRD	Drs. Prokop, Giasson
22-Oct	Interactive thematic discussion learning session	Drs. Prokop, Giasson
23-Oct	Break	
29-Oct	Midterm Exam	
30-Oct	Basic concepts of gene-environment interaction in ADRD, Part I	Joe Abisambra, PhD
5-Nov	Basic concepts of gene-environment interaction in ADRD, Part II	Joe Abisambra, PhD
6-Nov	Interactive thematic discussion learning session	Drs. Abisambra, Chakrabarty
12-Nov	Rodent and cellular models of ADRD	Paramita Chakrabarty, PhD
13-Nov	Non-rodent models of ADRD (e.g. drosophila)	Diego Rincon-Limas, PhD
19-Nov	Cognitive and behavioral aspects of ADRD models	Gemma Casadesus, PhD
20-Nov	Practical approaches to selecting experimental models	Paramita Chakrabarty, PhD
26-Nov	Discussion Learning session	Drs. Rincon, Abisambra, Chakrabarty
27-Nov	Thanksgiving	
3-Dec	Rigor, reproducibility, transparency, and power analysis	Ron Mandel, PHD
4-Dec	Final presentations (Group 1)	
10-Dec	Final presentations (Group 2)	

OPTIONAL Course Materials and Technology:

- 1) Background Information on Alzheimer's disease and related dementias:
 - **Primer: Alzheimer disease** <https://www.nature.com/articles/s41572-021-00269-y>
 - **CME Webcast and Webinars:**

<https://www.alz.org/professionals/health-systems-clinicians/cme-activities>

<https://www.alzforum.org/webinars>

- **2022 Alzheimer's Disease Fact and Figures**

<https://www.alz.org/media/documents/alzheimers-facts-and-figures.pdf>

- **Article:** The neuropathological diagnosis of Alzheimer's disease:

<https://molecularneurodegeneration.biomedcentral.com/articles/10.1186/s13024-019-0333-5>

- **Article:** Alzheimer's disease:

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)32205-4/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32205-4/fulltext)

- **Website resources:**

<https://www.alzheimers.gov/alzheimers-dementias>

<https://www.cdc.gov/aging/publications/features/alzheimers-disease-dementia.html>

2) Materials unique to some lectures will be distributed based on the most recent articles in the scientific literature.

For technical support for this class, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- [UF eLearning](#)

Academic Requirements and Grading: Assignments will be broadly divided into:

- 1) Homework
- 2) Assigned critical reading of research publications and in class presentation
- 3) 1-page capstone project presentation

Grading:

Requirement	Due date	Points or % of final grade (% must sum to 100%)
Midterm Exam	10/29/2024	20 points (20%)
Capstone Project	12/1/2024	25 points (25%)
Class participation*	N/A	50 points (50%)
Class Attendance	N/A	5 points (5%)

*Class participation	50 marks total
Homework (2):	20
Class discussion (individual discussion of selected research, group discussion):	20
Ask questions, interact with faculty presenters regularly:	10

Grading Scale:

(A) ≥ 93%; (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%; (E) ≤ 59%

More information on UF grading policy may be found at: <http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

Exam Policy:

There will be one written exam (open book) and a final project presentation. The written exam will consist of multiple-choice questions and short answer questions.

Policy Related to Make up Exams or Other Work

Students are fully responsible for any content missed due to unexcused absences. Students should meet with the instructors as soon as possible regarding University-excused absences so that accommodations can be made on a case-by-case basis. UF attendance policies are detailed in the following link: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

Policy Related to Required Class Attendance:

Class attendance is mandatory and will be part of the grade evaluation. The student must obtain prior permission for excused absences. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Excused absences must be consistent with university policies in the Graduate Catalog (<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance>). Additional information can be found here: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Student Expectations, Roles, and Opportunities for Input:

Class attendance will be assessed from active participation in all of these sessions, as well as class preparedness. Students are encouraged to ask questions in class and via email.

Expectations Regarding Course Behavior:

Students are expected to be active and respectful of the instructors and fellow student students in class. Examples of expectations include muting or turning off cell phones, sound effects originating from laptops or tablets, or other behaviors that might be disruptive to the flow of the classroom. These instances preclude proper learning.

Communication Guidelines:

Communication guidelines are expected to follow the Netiquette guidelines, which can be found in <http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

Academic Integrity:

Students are expected to act in accordance with the University of Florida policy on academic integrity. As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge:

“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.”

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied:

“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For additional information regarding Academic Integrity, please see Student Conduct and Honor Code or the Graduate Student Website for additional details:

<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

<http://gradschool.ufl.edu/students/introduction.html>

Please remember cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

Online Faculty Course Evaluation Process:

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>.

Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Policy Related to Guests Attending Class:

Only registered students are permitted to attend class. Unregistered attendees will not be allowed to attend these classes.

Support Services:

Accommodations for Students with Disabilities:

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. The College is committed to providing reasonable accommodations to assist students in their coursework.

Counseling and Student Health:

Students sometimes experience stress from academic expectations and/or personal and interpersonal issues that may interfere with their academic performance. If you find yourself facing issues that have the potential to or are already negatively affecting your coursework, you are encouraged to talk with an instructor and/or seek help through University resources available to you.

- The Counseling and Wellness Center 352-392-1575 offers a variety of support services such as psychological assessment and intervention and assistance for math and test anxiety. Visit their web site for more information: <http://www.counseling.ufl.edu>. On line and in person assistance is available.

- You Matter We Care website: <http://www.umatter.ufl.edu/>. If you are feeling overwhelmed or stressed, you can reach out for help through the You Matter We Care website, which is staffed by Dean of Students and Counseling Center personnel.
- The Student Health Care Center at UF Health is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at UF Health offers a variety of clinical services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: <https://shcc.ufl.edu/>
- UF Health Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32698, ufhealth.org/emergency-room-trauma-center.
- University Police Department: Visit police.ufl.edu/ or call 352-392-1111 (or 9-1-1 for emergencies).
- Crisis intervention is always available 24/7 from:

Alachua County Crisis Center:

(352) 264-6789

<http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.aspx>

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services career.ufl.edu/.

Library Support: cms.uflib.ufl.edu/ ask various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall 352-392-2010 or to make an appointment 352 392-6420. General study skills and tutoring. teachingcenter.ufl.edu/

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers. writing.ufl.edu/writing-studio/

Student Complaints On-Campus: sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/

On-Line Students Complaints: distance.ufl.edu/student-complaint-process