IDH3931 - Artificial Intelligence Applications for Psychiatry

Tuesdays, 10:40 a.m. EST - 11:30 a.m. EST (Period 4) Remote

CREDIT: 1 Semester Hour

Instructor:

Dr. Mihael Cudic, D.Phil.
Honors Dunlevie Professor
Office: Remote
Office Hours: Please email to schedule a meeting as needed
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Course Description:

Psychiatry grapples with complex challenges that arise from the intricacies of the human mind, requiring innovative computational analysis techniques to better understand and address these issues. This course will focus on ways in which AI can be used to understand the etiology of psychiatric conditions and predict their onset.

Throughout the course, students will be introduced to a wide array of machine learning methods, tailored for analyzing medical data. This will include an exploration of both traditional machine learning techniques, advanced deep learning models, and generative AI technologies.

In addition, a foundational understanding of neurobiology and clinical psychiatry will be offered to contextualize the computational techniques. Topics such as neural circuitry, neurotransmitter systems, and the psychological theories underpinning various psychiatric conditions will be covered, thereby bridging the gap between theoretical knowledge and practical AI applications in psychiatry.

While a background in math or engineering is not obligatory, a comprehension of calculus and linear algebra will be useful.

Assessment and Evaluation Criteria:

I. Attendance and Active Participation: 15 points

- Completion of assigned readings is mandatory before each class session when assigned.
- Regular attendance is crucial. Attendance will be recorded every class. While one absence is permitted without penalty, any subsequent unexcused absences will result in a 5 point deduction from your total grade (out of 100 points).

- Excused absences are consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation 24 hours in advance.
- Active engagement in class discussions is expected and recorded. 1 point will be reward for each class that the student responds to an online poll or survey.

II. Written Assignments: 85 points

1. Short Paper (30 points of total grade):
   o Length: 2 pages max (double spaced)
   o Content: This paper should be a synthesis of your personal reflections, understanding, and insights gained from the course readings and discussions.
2. Comprehensive Paper (55 points of total grade):
   o Length: 4 pages max (double spaced)
   o Content: This longer paper requires a more in-depth analysis, integrating course materials and class discussions.
   o The first proposal will be worth 10 points out of the total 55 points and the final paper will be worth 45 points out of the total 55 points.

- Submission Guidelines:
   o Papers must be submitted as Microsoft Word or PDF documents through the Canvas course platform.
   o Submissions received after the deadline will be subject to a deduction of 10% of the total points allocated to the assignment for each 24-hour period beyond the due date.
   o Rubrics will be provided before the papers are assigned.

Required Materials

There are no required materials for this course.

UF Class Attendance Policies:

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

Students with Disabilities:

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Grading Policy

A numerical grade will be given at the end of the course and will be scored as follows:

Percent Points	Grade	Grade Points
≥93.4	A	4
≥90.0	A-	3.67
≥86.7	B+	3.33
≥83.4	B	3
≥80.0	B-	2.67
≥76.7	C+	2.33
≥73.4	C	2
≥70.0	C-	1.67
≥66.7	D+	1.33
≥63.4	D	1
≥60.0	D-	0.67
<59.99	E	0

Course Evaluation:

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 gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations via email, in their Canvas course menu under GatorEvals, or via ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

Course Schedule

Jan 9 (class 1) – Course Introduction; Challenges with Multi-disciplinary Work

Jan 16 (class 2) – An Overview of Psychiatric Conditions

Jan 23 (class 3) – An Overview of the History and Challenges of Psychiatry

Jan 30 (class 4) – Psychiatry Case Study: Open Discussion with Guest Speaker (TBD)

Paper 1 DUE Feb 1st at 11:59pm

Feb 6 (class 5) – Foundations of Neuroscience

Feb 13 (class 6) – Neuroscience Case Study: Open Discussion

Feb 20 (class 7) – Machine Learning for Psychiatry

Feb 27 (class 8) – Deep Learning for Psychiatry

Mar 5 (class 9) – Machine Learning Case Study: Open Discussion

Mar 19 (class 10) – Generative AI for Psychiatry

Mar 26 (class 11) – Generative AI Case Study: Open Discussion with Guest Speaker (TBD)

Paper 2 Proposal DUE March 28th at 11:59pm

Apr 2 (class 12) – Datasets and Limitations

Apr 9 (class 13) – Ethical Considerations in AI for Psychiatry

Apr 16 (class 14) – Future Applications

Apr 23 (class 15) – Course Review and Final Discussions; Looking Ahead

Paper 2 DUE Apr 25th at 11:59pm

Syllabus is subject to change based on the needs of the course.