The University of Texas at Dallas
Applied AI
Fall 2026
BUAN 6343

Course Information

Course Number/Section	BUAN 6343.501
Course Title	Applied AI
Day & Time	Monday, 7:00 p.m. - 9:45 p.m.
Classroom	SOM 2.801

Instructor Contact Information

Professor	Harpreet Singh
Office Phone	972-883-4770
Email Address	harpreet@utdallas.edu
Office Location	JSOM 3.430
Office Hours	By Appointment
TA name	Ritik Sharma
TA Office Hours	*TBD*

Course pre-requisites
None

Course Description
Practical development and evaluation of applied AI systems for business. Topics include machine learning, neural networks, language models, attention, Transformers, prompting, structured outputs, retrieval-augmented generation, tool-using agents, evaluation, and end-to-end application development. Students will design, build, test, and communicate AI solutions that support business processes and decision-making.

Course Learning Objectives
1. Explain the foundations of machine learning, neural networks, language models, attention, Transformers, and modern AI assistants.
2. Design effective prompts and validated structured outputs for business applications.
3. Build retrieval-augmented generation systems that produce grounded answers with appropriate source citations.
4. Design bounded AI agents that use tools, retrieval, state, and short-term memory.
5. Create evaluation datasets and use them to assess retrieval, answer quality, tool use, reliability, latency, and cost.
6. Build and evaluate an end-to-end applied AI application.

Course Access and Navigation
The course can be accessed using your UT Dallas NetID through Canvas. Course materials, announcements, assignments, and grades will be available in the course Canvas site.

Communication
We will use regular email (harpreet@utdallas.edu) and a web conferencing tool (Teams) during the semester. Please copy TA on all communications. **Student emails and messages will be answered within 3 working days under normal circumstances**.

Textbook
There is no required Textbook for the course.

Recommended Textbooks:

- Chip Huyen, AI Engineering: Building Applications with Foundation Models
- Jay Alammar & Maarten Grootendorst, Hands-On Large Language Models: Language Understanding and Generation

Tools and Languages Used

- Language: Python
- Deep Learning: PyTorch and Hugging Face
- Applied AI Development: Pydantic, LangChain, LangGraph, and LangSmith
- Application Development: FastAPI and Streamlit

Class Format
This course is taught in person. Class meetings combine concise explanations, guided demonstrations, hands-on activities, and review of system behavior and outputs. Supporting videos or reference materials may also be posted in Canvas.

Class Materials
The Instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course; however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student Access Ability accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Homework Assignments:
Homework assignments require individual work unless an assignment states otherwise. Submit each assignment in the required format through Canvas; instructions and due dates will be posted there.

Generative AI Use
Generative AI tools may be used only as permitted in each assignment. When use is permitted, students must follow the assignment-specific directions; disclose and document AI assistance as requested; verify generated content, analysis, and code; protect confidential, proprietary, and personal data; and be able to explain and defend every part of the submission. Generative AI may not be used on exams or quizzes unless explicitly authorized. Undisclosed or unauthorized use is academic misconduct. See https://policy.utdallas.edu/utdsp5017.

Exams:
There are two exams for this course.
Both exams will be proctored at the UT Dallas Testing Center. Students must reserve a seat no later than 48 hours before the exam. Review current reservation instructions and Student Guidelines at https://ets.utdallas.edu/testing-center/.

Grading Policy
Your grade in the course will be based on the following items:

Class Participation	5
Homework Assignments / In-Class Quizzes	35
Exam 1	25
Exam 2	35
Total	100

These are the only scores used to determine the course grade. No extra-credit work or repeat exams will be offered, and late work will not be accepted unless otherwise stated in an assignment or required by University policy. Semester averages will be rounded to the nearest whole percentage point before the grading rules below are applied.

Grading Scale:
Final letter grades are based on overall performance relative to classmates. Students must earn a passing grade on each exam and major applied assignment to be eligible for a final course grade of C or higher. The relative grade bands below are subject to the minimum percentage requirement.

Your course grade will depend on your overall score relative to your peers.
1) Students at or above the 80th percentile will earn an A.
2) Students at or above the 60th percentile and below the 80th percentile will earn an A-.
3) Students at or above the 40th percentile and below the 60th percentile will earn a B+.
4) Students at or above the 20th percentile and below the 40th percentile will earn a B.
5) Students at or above the 10th percentile and below the 20th percentile will earn a B-.
6) The instructor will determine letter grades for students below the 10th percentile.
7) An overall course score below 60% earns an F, regardless of percentile.

Tentative Class Schedule
These descriptions and timelines are subject to change at the discretion of the instructor.

Additional notes, instructions and useful links will be posted on Canvas/Teams, so please make sure to stay current on materials and announcements posted between meetings. ***You are responsible for keeping up with all posted material and announcements, so make sure you check Canvas/Teams on a daily basis.***

Date	Topics Covered
Aug. 24	Machine-Learning Foundations
Aug. 31	Neural Networks, Tokenization, and Embeddings
Sept. 7	Labor Day
Sept. 14	Language Models, RNNs, and Attention
Sept. 21	Transformer Architecture and Pretraining
Sept. 28	From Base Models to Modern AI Assistants
Oct. 5	Prompting, Context, and Structured Outputs
Oct. 12	AI-Assisted Workflow Automation
Oct. 19 (Monday) -22 (Thursday)	Exam 1
Oct. 26	Two-Step RAG and LangSmith Tracing
Nov. 2	Implementing Reflection-Based Agents with LangGraph
Nov. 9	Agentic Tool Use: ReAct, RAG as a Tool, and Short-Term Memory
Nov. 16	Evaluation-Driven Improvement
Nov. 23	Fall Break
Nov. 30	Backend Engineering with FastAPI
Dec. 1 (Tuesday)-4 (Friday)	Exam 2
Dec. 7	End-to-End AI Application with Streamlit

Make-Up Policy

Students are expected to complete assignments and assessments on the scheduled dates. If an emergency, documented illness, religious observance, military obligation, disability-related accommodation, or other University-recognized circumstance prevents timely completion, notify the instructor as soon as reasonably possible, preferably before the deadline, and provide documentation when appropriate. Approved make-up work will be scheduled consistent with University policy. Routine conflicts or late notice without a qualifying circumstance generally do not warrant a make-up. Assignment-specific late policies will be stated in Canvas.

Academic Integrity

Students must comply with the UT Dallas Student Code of Conduct and University academic-integrity policies. Unauthorized assistance, plagiarism, cheating, fabrication, or collusion on any submitted work is prohibited. Suspected violations will be referred to the Office of Community Standards and Conduct and handled through the University process. Course-specific expectations for generative AI use are stated above, and assignment-specific directions govern. See https://go.utdallas.edu/syllabus-policies for current policies and procedures.

UT Dallas Syllabus Policies and Procedures

The information at https://go.utdallas.edu/syllabus-policies constitutes the University policies and procedures segment of this syllabus.