SYLLABUS
BCIS 5140.001: Artificial Intelligence in Business
Fall 2022

Lectures: BLB 055, Monday, 6:30-9:20 PM
Instructor: Dr. Anna Sidorova, Office: BLB 208A
Email: anna.sidorova@unt.edu, Phone: (940)565-3042
Office Hours: Mon. 5-6 PM, Wed 1-2 PM in office, or by appointment.

COURSE DESCRIPTION
The course offers an integrated perspective on the opportunities and challenges associated with the introduction of artificial intelligence (AI) and machine learning capabilities into business computer information systems. Topics include technical foundation of AI, survey of current AI capabilities, AI applications in business, implications of AI for business and society and AI governance. Prerequisite(s): none.

Course Learning Objectives
Upon successful completion of this course, you are expected to be able to:
  CLO 1: Evaluate and articulate the potential of AI technologies for value delivery in different business contexts;
  CLO 2: Understand key Machine Learning (ML) concepts and techniques, and build of simple ML models using static data sets;
  CLO 3: Describe commonly used ML algorithms and perform ML algorithm selection to address business problems;
  CLO 4: Compare and contrast key data management and application integration architectures, technologies and practices used in the context of AI-driven transformation, and evaluate their feasibility for organizational and AI application contexts;
  CLO 5: Identify and articulate key AI management and governance practices, and apply them to organizational and AI application contexts;
  CLO 6: Develop deep expertise in a selected competence area related to AI via the hands-on term project.

PREREQUISITES
There are no prerequisites for this course, but students are expected to have working knowledge of Python programming (especially Python libraries for data science), and basic understanding or IT management and cloud computing concepts. LinkedIn Learning (available free of charge to UNT students) offers a variety of courses that can help build necessary background knowledge. It is also recommended that the students refresh their understanding of basic calculus and matrix algebra concepts.

TEXTS, SOFTWARE
Text required:

Text recommended:
Other readings:
Industry reports and publications as indicated in course modules. All assigned reports will be available online and via UNT library

Software:
Python, Tensorflow, Keras (you need to have a laptop or a PC on which you can download these programs), access to cloud resources – you will be asked to create trial or student accounts with one or more of the following cloud service providers: AWS, Google (GCP) and Microsoft (Azure).

Online learning:
- As a UNT student, you are expected to have access to LinkedIn learning (Links to an external site.) which will be extensively utilized in this course. Students will also be asked to create an account with one or more of the following cloud service providers: AWS, Google (GCP) and Microsoft (Azure).
- Students will be expected to make heavy use of Geron’s Github site (Links to an external site.). In fact, several assignments will be based directly on the content of this site.

Course Canvas Site:
Course announcements and additional course materials will be posted on Canvas.

General technology needs:
Students are expected to have a personal laptop which they will need to bring to class of specified days. In addition, in the event we need to move an occasional class meeting online, students need to have a location with Internet access, from which they will be able to attend a class remotely.

COURSE ASSIGNMENTS AND EVALUATION

Your performance will be evaluated as follows:

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Points</th>
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<tbody>
<tr>
<td>Individual Quizzes/In class assignments (10 at 20 points each)</td>
<td>200</td>
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<tr>
<td>Individual Homework assignments (5 best count towards grade at 20 points each)</td>
<td>100</td>
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<tr>
<td>Team Project Proposal</td>
<td>100</td>
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<tr>
<td>Team Final Project Report</td>
<td>200</td>
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<tr>
<td>Team Final Project Presentation</td>
<td>100</td>
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<tr>
<td>Individual Midterm exam (in class)</td>
<td>150</td>
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<tr>
<td>Individual Final exam (in class)</td>
<td>150</td>
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<tr>
<td><strong>TOTAL</strong>*</td>
<td><strong>1000</strong></td>
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</tbody>
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*Extra-credit assignment may be announced in class. The total extra credit opportunities will not be in excess of 20 points (2% of the grade).

Grades will be assigned as following
A = 90%-100%; B = 80%-89%; C = 70%-79%; D = 60%-69%; less than 60% = F

Homework assignments
There will be 7-10 homework assignments at 20 points each, with best 5 grades counting towards your HW grade. Most assignments will be of technical nature and include installation and configuration of SW, programming, and the use of cloud computing tools. Some assignments will address the business/managerial side of AI and may include cost calculations, and on-line discussions on AI management practices. Some of the homework assignments will need to be submitted using Turnitin and will be checked for proper attribution and citations of source materials.

**Quizzes**
There will be 10 quizzes or in-class assignments designed to check students' understanding of the module material and to promote student engagement. Quizzes will be timed, contain a variety of closed and open-ended questions, and reflect the content of assigned module readings and end-of-module assignments. Quiz questions will generally be easier than exam questions. Unless clearly instructed otherwise, quizzes need to be answered individually without help from other students. In-class assignments may be individual or group assignments, with students forming ad hoc groups for each assignment. In-class assignments will be submitted by the group during the class, usually in a paper format.

**Term Project**
As a part of the class, you will work on a term project in a three- or four-person team. The goal of the term project is to identify a business problem that can be addressed using AI technology, a design of an AI-based solution, and develop a proof of concept prototype of the proposed solution. Each team will submit a project proposal identifying the business problem and outlining an AI-based approach to addressing it, a final report describing solution design and how such solution would address the business problem. The final report will also include solution prototype and feasibility assessment of the solution for a given organizational context, and implementation considerations. Each team will also deliver a 10-15 min presentation to the class highlighting the proposed AI solution. Students may need to sign a non-disclosure agreement to obtain access to external partners’ data as a part of this project. Project final report will be submitted using Turnitin software and checked for plagiarism. Similarity levels above 10% will result in a grade reduction on the assignment, above 20% will result in a failing grade in on the assignments, above 30% will result in an F in the class for the entire team and an academic integrity report filed for all team members.

**Managing teamwork.** Students will be randomly assigned to teams at the beginning of the class. All team members are expected to contribute equitably to the project. It is up to the team to determine equitable distribution of responsibilities for the project. If a team member is not actively contributing to the project, the team is allowed to fire a team member at any time **before the date indicated in the schedule.** In order to fire a team member, the team should first issue a warning to the non-contributing team member which clearly states the expectations of contributions, followed (no less than one week later) by a firing notice signed by all remaining team members sent to the team member and the instructor. A team member fired from a team will not receive credit for any assignments submitted by the team after the date of “firing”. Similarly, a team member can elect to quit a team following a similar process. A team member fired by a team or voluntarily leaving the team may team up with other “unemployed” student, or submit remaining assignments individually. Individual submissions will be evaluated using the same criteria as group submissions. At the end of the semester, each team (except for those dismissed from the team) will submit a peer evaluation document signed by all team members reflecting individual contributions to the project. Below average contribution of a team member as reflected in team evaluation may result in downward adjustment of individual project grades.
Exams
There will be a mid-term exam and a comprehensive final exam. Both exams will be administered in class. An exam may require the use of a laptop with a Respondus lockdown browser. If laptop use is indicated in the instructions for the exam, students would need to bring their own laptop to the exam. Laptops are available for check out a laptop from UNT libraries. No make-up exams will be given with the exception of cases of documented medical or family emergency.

COURSE POLICIES

Late Submission Policy
All assignments are due at the time indicated in the schedule. For some assignments, late submissions may be accepted for 50% credit if submitted within 2 weeks of the due date (requires consent of the instructor, individual assignments only).

Student email information
Enabling students' access to certain cloud computing resources used in this class requires releasing student UNT email information to cloud providers and affiliated parties. It is your responsibility to notify the instructor within 5 days from the beginning of the semester if you DO NOT want your email information to be released. In such case, you assume the responsibility for procuring access to the necessary cloud resources.

Professional Communication
Students will communicate with the instructor verbally and in writing using professional language. All written communication will be composed using proper grammar and spelling. All electronic communication will be conducted over email (not on canvas). All student emails to the instructor will be sent from the student’s official UNT email with a subject line starting with: BCIS 5140: <Type of concern>. Emails sent in violation of these guidelines will be ignored. All grade related questions and concerns need to be communicated in writing over email (not on canvas) with the subject line: BCIS 5140: Grade Concern. Any grade-related emails should only contain information relevant to the grade in question. Any references to your grades in other courses, or the impact of the grade on your overall academic standing are irrelevant and will result in the grade concern being dismissed.

Class attendance and participation
In-person class attendance is expected. No standard accommodations for non-attending students will be provided. Come on time and stay for the duration of each class. It is critical that you not only attend class meetings, but are fully engaged and participating in such meetings. Excessive absences and failure to participate will impact your grade. Specifically, more than 3 absences without a documented medical reason may reduce your overall points by ½ a letter (50 points) and more than 6 absences may reduce your grade by 1 letter (100 points). Coming to class late (defined by the instructor as 6:35 pm or after) more than 3 times may reduce your overall points by (25 points) and more than 6 times may reduce your overall points by ½ a letter (50 points). In addition, if you must miss a class, you remain fully responsible for all material, changes in the schedule, and other information given during class.

Student conduct
Students are expected to behave in a respectful and professional manner when in class and when interacting with the instructor and other students. Talking in class during the lecture is very disruptive even when done at a low voice. If you want to contribute or ask a question,
please raise your hand. Students engaging in disruptive behavior, including talking during the
lecture without an explicit permission, will be asked to leave the classroom resulting in an
absence and a corresponding grade penalty as described in the section on attendance.
Disruptive students, including those talking in class without permission of the instructor, who
refuse to leave the class will incur grade penalties up to a failing grade in the course, will be
reported to the Dean of Students, and may be forcefully removed from the classroom by the
UNT police.

Health-related absences
Students are expected to attend class meetings regularly and to abide by the attendance policy
established for the course. If you cannot attend a specific class section due to a health-related
reasons, it is important that you communicate with the me prior to being absent so that we can
discuss and mitigate the impact of the absence on your attainment of course learning goals. If
you experience a medical emergency that may result in more than one absence or inability to
submit assignments on time, please notify the Dean of Students and the instructor as soon as
possible to minimize the impact on academic standing.

Class Recordings & Student Likenesses
I may record class lectures and presentations, and may provide access to recordings to
students who miss a class due to a medical or health reason. Class recordings are the
intellectual property of the university or instructor and are reserved for use only by students
in this class and only for educational purposes. Students may not post or otherwise share
the recordings outside the class, or outside the Canvas Learning Management System, in
any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct
and could lead to disciplinary action.

Penalty for academic integrity violations
Students found to be in violation of academic integrity standards will incur penalties ranging
from a failing grade of a specific assignment to a failing grade in the course. Cheating on an
exam or assisting others in cheating, misrepresenting others' work as your own, and severe
plagiarism (over 30% similarity on the project) will result in a grade of F in the course. All
academic integrity violations will be reported to the Academic Integrity Office.

COLLEGE OF BUSINESS AND UNIVERSITY POLICIES AND PROCEDURES

Academic Integrity Standards and Consequences
According to UNT Policy 06.003, Student Academic Integrity (available at
https://vpaa.unt.edu/fs/resources/academic/integrity), academic dishonesty occurs when
students engage in behaviors including, but not limited to: cheating, fabrication, facilitating
academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty
may result in a range of academic penalties or sanctions ranging from admonition to
expulsion from the University.
Additional information regarding RCOB and ITDS academic integrity policies and practices
will be posted on the Canvas site. All students are expected to sigh and submit a copy of
ETHICAL BEHAVIOR IN ITDS CLASSES form.

Acceptable Student Behavior
Student behavior that interferes with an instructor's ability to conduct a class or other
students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any
instructional forum at UNT. Students engaging in unacceptable behavior will be directed to
leave the classroom and the instructor may refer the student to the Dean of Students to
consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at https://deanofstudents.unt.edu/conduct.

**ADA Accommodation**
UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one’s specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at http://disability.unt.edu

**Student Evaluation Administration Dates.**
Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13, 14 and 15 of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the SPOT website at www.spot.unt.edu or email spot@unt.edu.

**Emergency Notification & Procedures.**
UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Blackboard for contingency plans for covering course materials.

**Emergency Evacuation Procedures for Business Leadership Building**

**Severe Weather.** In the event of severe weather, all building occupants should immediately seek shelter in the designated shelter-in-place area in the building. If unable to safely move to the designated shelter-in-place area, seek shelter in a windowless interior room or hallway on the lowest floor of the building. All building occupants should take shelter in rooms 055, 077, 090, and the restrooms on the basement level. In rooms 170, 155, and the restrooms on the first floor.

**Bomb Threat/Fire.** In the event of a bomb threat or fire in the building, all building occupants should immediately evacuate the building using the nearest exit. Once outside, proceed to the designated assembly area. If unable to safely move to the designated assembly area, contact one or more members of your department or unit to let them know you are safe and inform them of your whereabouts. Persons with mobility impairments who are unable to safely exit the building should move to a designated area of refuge and await assistance from emergency responders. All building occupants should immediately evacuate the building and proceed to the south side of Crumley Hall in the grassy area, west of parking lot 24.
**TENTATIVE COURSE SCHEDULE**

The topics and dates as outlined in the course schedule are subject to change. All necessary changes will be announced and discussed in class in advance. You are responsible for making sure you are aware of any such changes.

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<thead>
<tr>
<th>Date</th>
<th>Subjects covered</th>
<th>Deliverables</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>29-Aug</td>
<td>Course introductions, AI competencies</td>
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<td>Course agreement and permissions quiz</td>
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<td>Week 2</td>
<td>5-Sept</td>
<td>Labor Day, no class</td>
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<td>HW 0 (non-graded): Python setup, cloud access set-up</td>
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<td>Week 3</td>
<td>12-Sept</td>
<td>AI use cases and the role of ML.</td>
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<td>ML process and concepts.</td>
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<td>Project teams finalized</td>
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<td>Week 4</td>
<td>19-Sept</td>
<td>Working with data, feature engineering</td>
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<td>HW 0 (non-graded): Python setup, cloud access set-up</td>
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<td>Week 5</td>
<td>26-Sept</td>
<td>Traditional ML algorithms</td>
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<td>HW 1: Data preparation</td>
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<td>Week 6</td>
<td>3-Oct</td>
<td>Deep learning</td>
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<td>HW 2: Linear regression</td>
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<td>Week 7</td>
<td>10-Oct</td>
<td>Model tuning, evaluation and selection</td>
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<td>HW 3: ANN and DL Team project Proposal due</td>
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<td>Week 8</td>
<td>17-Oct</td>
<td>MIDTERM EXAM</td>
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<td>Intelligent agent model and hyper automation</td>
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<td>HW 4: Model evaluation</td>
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<td>Week 9</td>
<td>24-Oct</td>
<td>Data pipelines and AI architectures</td>
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<td>HW 5: AI in the Cloud I – GCP or AWS Lab</td>
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<td>Week 10</td>
<td>31-Oct</td>
<td>Deploying ML models and AI services</td>
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<td>HW 6: AI in the Cloud II – GCP or AWS Labs</td>
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<td>Week 11</td>
<td>7-Nov</td>
<td>Planning for AI</td>
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<td>HW 7: AI in the Cloud III – Pricing</td>
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<tr>
<td>Week 12</td>
<td>14-Nov</td>
<td>Managing AI in organizations</td>
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<td>HW 8: TBD</td>
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<td>Week 13</td>
<td>21-Nov</td>
<td>Responsible AI</td>
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<td>Week 14</td>
<td>28-Nov</td>
<td>Project presentations</td>
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<td>Week 15</td>
<td>5-Dec</td>
<td>Project presentations</td>
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<td>Final reports due</td>
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<td>Week 16</td>
<td>12-Dec</td>
<td>FINAL EXAM</td>
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<td></td>
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<td>No rescheduling due to travel plans, no online option</td>
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