SYLLABUS
BCIS 5140.001: Artificial Intelligence in Business
Fall 2020

Lectures: Zoom (see Canvas site for link), Thursday, 6:30-9:20 PM
Instructor: Dr. Anna Sidorova, Office: BLB 358B
Email: anna.sidorova@unt.edu, Phone: (940)565-3109
Office Hours: Wed 12-2 PM, Thu. 5-6 PM, same Zoom meeting room as the class.

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 (weeks 1, 7, 10-15);
CLO 2: Understand key Machine Learning (ML) concepts and techniques, and build of simple ML models using static data sets (weeks 2-6);
CLO 3: Describe commonly used ML algorithms and perform ML algorithm selection to address business problems (weeks 4-5);
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 (weeks 7-9).
CLO 5: Identify and articulate key AI management and governance practices, and apply them to organizational and AI application contexts (weeks 10, 11, 15).
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.

General technology requirements:
This is a remote course, so all students are expected to have:
• Computer with internet access
• Microsoft Office Suite
• Microphone
• Webcam

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

**COURSE ASSIGNMENTS AND EVALUATION**

Your performance will be evaluated as follows:

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Individual Mini-lecture presentations</td>
<td>100</td>
</tr>
<tr>
<td>Individual End-of-module quizzes</td>
<td>200</td>
</tr>
<tr>
<td>Individual End-of-module assignments</td>
<td>200</td>
</tr>
<tr>
<td>Individual Class participation</td>
<td>100</td>
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<tr>
<td>Team Final Team Project Report</td>
<td>100</td>
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<tr>
<td>Individual Final Project Individual Contribution and Reflection</td>
<td>100</td>
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<tr>
<td>Team Final Project Presentation</td>
<td>100</td>
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<tr>
<td>Individual Final exam</td>
<td>100</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1000</strong></td>
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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

Mini-lecture presentation
Each student will be responsible to prepare a mini-lecture on an assigned topic and present it in class using Zoom. Such presentations will be scheduled starting with the 2nd week of classes. Each presentation should last 10 min, cover the specified content, and provide a well-organized, correct sufficiently in-depth and easy to follow explanations of the material. Specific content requirements and suggested or required sources for each presentation topic are outlined in the corresponding course modules. The students will be required to use a standard PPT presentation template for their presentation, but are encouraged to supplement their PPT with live demos using relevant tools and software. The students are required to submit their presentation PPT presentations files on Canvas before the beginning of the class on which they are presenting.

During the presentation, the student will assume the role of an instructor, so it is expected that a student will learn the topic they are presenting much-more in-depth than what is being presented. The student will be expected to provide thoughtful, and correct answers regarding the topic they are presenting to their fellow students.

Students are randomly assigned to topics by the instructor, and are expected to present on the day for which the topic is scheduled. The list of assignments will be posted here. A student may request to be reassigned to one of the limited number (4-5) of advanced topics on a first-come-first-serve basis. A students can also trade their presentation topic/spot with another student on a voluntary basis. Such trade should be agreed upon by both students and approved by the instructor.

End-of-module assignments
There will be 10 end-of module assignments at 15-25 points each, with some assignments carrying potential for extra credit for advanced independent technical work. Any extra-credit opportunities will be specified in the assignment description. No additional extra credit will be offered. Some assignments will be of technical nature and include installation and configuration of SW, programming, and the use of cloud computing tools. Other assignments will address the business/managerial side of AI and may include cost calculations, and on-line discussions on AI management practices.

End-of-module quizzes
There will be 10 end-of-module quizzes designed to test students’ understanding of the module material. 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. Multiple attempts may be allowed for some of the quizzes.

Team Project
As a part of the class, you will work on a term project in a three or four person team. Individual project work may be allowed by the instructor on an exception basis. You can select from two options: a technical and a managerial. You will need to submit a final report and make a 10 min in-class presentation.
Technical option (recommended) is designed for students who are interested in developing expertise related to a specific technical environment. As a part of the project, you will need to develop a prototype of an application that relies on a custom-built ML model or incorporates AI capabilities from one of the third party platforms discussed in class. You will also need to create a report discussing the business or consumer need addressed by the application, application functionality and the AI capabilities incorporated, and include technical documentation of the application (SW and HW specification, source code with comments, etc.).

Managerial option is designed for students who are interested in gaining a deeper understanding of managerial and societal implications of AI. As a part of the project, the students will be asked to write a white paper on a specific set of challenges or opportunities related to AI. The paper should be sufficiently focused to allow for in-depth analysis of the problem and the development of concrete solution options. For example, instead of writing about opportunism or challenges afforded by of self-driving cars in general, one may address a specific issue of ownership of data collected by such cars, or a comparative review of current regulations regarding self-driving cars and their implications for the adoption of such cars.

Team project deliverables will include a team zoom presentation (10 minutes per team), a team project report which will document the overall contribution of the team, and an individual reflection and contribution survey which will be prepared and submitted by individual team members. All team members will receive the same grade on the team presentation and final report, but grading of the individual reflection and contribution survey will reflect individual contributions of the team member.

Class participation
The grade for class participation will be assessed based on students' participation in Zoom sessions (via chat), including actively engaging with guest speakers. The grade will be assigned in a holistic manner and will take into account quality and frequency of participation. The course agreement and permissions quiz will count towards course participation. Class participation grade also includes Course Agreement and Permissions quiz and the submission of Ethical Behavior in ITDS classes form.

Final Exam
There will be a comprehensive timed on-line final exam which will take place during the regular class time during the finals week. The exam will be administered using Respondus Lock-Down browser. You are not allowed to provide or accept any help on exam (in-class or take-home from other individuals. Doing so would constitute a violation of academic integrity policy. No make-up exams will be given with the exception of cases of documented medical or family emergency.

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).

COURSE POLICIES
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.

**Class attendance and participation**

Attendance during scheduled synchronous Zoom sessions is expected. Join on time and stay for the duration of each class. If you must miss a class, you remain fully responsible for all material, changes in the schedule, and other information given during class. I will do my best to record Zoom sessions and post them after the class, but you are not to take those for granted. If you miss a class on the day on which you are scheduled to make the mini-lecture presentation you will receive a zero grade for such presentation. If you know in advance that you cannot make it to class when you are scheduled to present, please contact the instructor in advance.

**COVID-19 impact on attendance**

While attendance is expected as outlined above, it is important for all of us to be mindful of the health and safety of everyone in our community, especially given concerns about COVID-19. Please contact me if you are unable to attend class because you are ill, or unable to attend class due to a related issue regarding COVID-19. It is important that you communicate with me prior to being absent as to what may be preventing you from coming to class so I may make a decision about accommodating your request to be excused from class.

If you are experiencing cough, shortness of breath or difficulty breathing, fever, or any of the other possible symptoms of COVID-19 (https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or askSHWC@unt.edu) or your health care provider. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.

**Class Recordings & Student Likenesses**

Synchronous (live) sessions, including student mini-lecture presentations, in this course will be recorded for students enrolled in this class section to refer to throughout the semester. 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.

**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.

**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. Due data for end of module quizzes are indicated in Canvas, but you should generally assume that they are due by Sat of the week in which the material is covered in class.

<table>
<thead>
<tr>
<th>Date</th>
<th>Subjects covered</th>
<th>Deliverables</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>27-Aug Course introductions, AI competencies</td>
<td>Course agreement and permissions quiz</td>
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<tr>
<td>Week 2</td>
<td>3-Sept ML process and concepts</td>
<td>EOMA 1: Python setup</td>
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<td>Week 3</td>
<td>10-Sept Data preparation and feature engineering</td>
<td>EOMA 2: Data preparation</td>
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<td>Week 4</td>
<td>17-Sept Traditional ML algorithms</td>
<td>EOMA 3: Linear regression</td>
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<td>Week 5</td>
<td>24-Sept Deep learning</td>
<td>EOMA 4: ANN and DL HW</td>
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<td>Week 6</td>
<td>1-Oct Model tuning, evaluation and selection</td>
<td>EOMA 5: Model evaluation</td>
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<tr>
<td>Week 7</td>
<td>8-Oct Intelligent agent model and hyper automation</td>
<td>Team project ID due (non-graded)</td>
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<td>Week 8</td>
<td>15-Oct Data sources and AI architectures</td>
<td>EOMA 6: AI in the Cloud I – GCP or AWS Lab</td>
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<td>Week 9</td>
<td>22-Oct Deploying ML models and AI services</td>
<td>EOMA 7: AI in the Cloud II – GCP or AWS Labs</td>
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<td>Week 10</td>
<td>29-Oct Planning for AI</td>
<td>EOMA 8: AI in the Cloud III – Pricing</td>
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<td>Week 11</td>
<td>5-Nov Managing AI in organizations</td>
<td>EOMA 9: AI management discussion</td>
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<td>Week 12</td>
<td>12-Nov Project presentations</td>
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<tr>
<td>Week 13</td>
<td>19-Nov Project presentations</td>
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<tr>
<td>Week 14</td>
<td>26-Nov THANKSGIVING, NO CLASS</td>
<td>Final reports and individual reflections are due by Nov 29</td>
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<tr>
<td>Week 15</td>
<td>3-Dec Responsible AI</td>
<td>EOMA 10: Responsible AI discussion</td>
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<tr>
<td>Week 16</td>
<td>10-Dec FINAL EXAM ONLINE</td>
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