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Syllabus

AI 500 - Artificial Intelligence Overview

School of Technology & Computing

3 Credits, Graduate Course
Grading Type: Decimal
Fall 2022

Access to the Internet is required.
All written assignments must be in Microsoft-Word-compatible formats.
See the library's APA Style Guide tutorial for a list of resources that can help you use APA style.

Faculty Information

Professional experience information for instructors is found under *Faculty Information* in the online course menu.

Contact Information

Contact information for instructors is found under *Faculty Information* in the online course menu.

Email: [first name] [last name]
Phone: [xxx-xxx-xxxx]
Office Hours and Response Time: [I am available through MS Teams <day> and <day> between <xx>-<xx> pm PTS. I will respond within 24 hours. I will grade within 3 business days after the due date.]
Bio: (keep images under 300px wide)

Course Description

This course examines the basic principles and core building blocks of Artificial Intelligences (AI). Topics include knowledge representation, reasoning, and learning and how these principles are applied in natural language processing (NLP), perception, and robotics. Candidates apply the knowledge to explore how AI is currently used and identify its impact and problems.

Course Resources

Required and recommended resources to complete coursework and assignments are found on the course Reading List. The reading list can be found under Course Information in Blackboard as well as from the library homepage.

Note: Required resources that must be purchased by the student are tagged “Purchase from a vendor of your choosing.” Required resources with a direct link, “Available through CityU Library”, are available at no cost to students.

Students in Canada will see required resources they need to purchase tagged “Purchase from the Canadian Bookstore.” Students outside the U.S. and Canada should contact their advisor or textbook coordinator for additional information.

Course Outcomes

At the end of this course, students:

1. Understand the history of AI, guiding principles of AI in various industries.

2. Identify how AI solves problems in industry and enterprise computing.
3. Explain AI in terms of machine learning, deep learning and expert systems.
4. Apply the knowledge to identify how AI is used today and in near future.
5. Evaluate AI project on the Cloud, its impact, and potential benefits and problems.
6. Design a common AI workload for prediction/forecasting, anomaly detection, natural language processing, or conversational AI.

Grading Scale

The grades earned for the course will be calculated using City University of Seattle's decimal grading system, found in the current University Catalog (https://www.cityu.edu/catalog/).

Grading rubrics with details on how each assignment will be graded are located under *Assignments* and/or in *My Grades* in the online course menu. Students should review each assignment's rubric before completing their work to understand how it will be assessed.

OVERVIEW OF REQUIRED ASSIGNMENTS	% OF FINAL GRADE	POINTS
Instructor Determined Assignments	***30%***	
The Muddiest Point (MP)	5%	50 = 5 points * 10 modules
Concept Test (CT)	5%	50 = 5 points * 10 modules
Discussion Board (DB)	10%	100 = 10 points * 10 modules
Knowledge Check (KC)	10%	100 = 10 points * 10 modules
M*ajor Assignments*	***70%***	
Hands-On Skills (HOS)	20%	200 = 20 points * 10 modules
Virtual Lab (VL)	30%	300 = 30 points * 10 modules
Team Project (TP)	20%	Proposal: 30 points Progress: 70 points Final Report: 70 points Final PPT: 30 points Subtotal: 200 points
TOTAL	**100%**	**1,000 points**

Course Assignments and Grading

The instructor will provide grading rubrics that will explain how this assignment will be graded.

The Muddiest Point (MP)

Before class, students are required to submit the Muddiest Point (MP) activity. The purpose of this activity is to ensure students are engaged in the course and understand the guiding principles of AI in various industries and how AI solves problems in industry and enterprise

computing. The instructor uses the MP to assess how students understood the required readings. The instructor also uses the MP to customize the lecture scope to implement Just-in-Time Teaching (JiTT). The MP consists of writing a brief reflective essay (<= 50 words) identifying the most confusing part (i.e., the MP) of the content covered in the upcoming module. If a student understood all concepts, the student needs to explain the most exciting aspect. There is one multiple-choice question from the required reading to demonstrate that the student understood the required readings.

Criteria	***% of Grade***
Participation	80%
Correctness	20%
TOTAL	**100%**

Concept Test (CT)

The concepts tests will reinforce what is learned in lectures and readings by asking students to reflect on specific aspects of AI, in terms of machine learning, deep learning/neural networks, and expert system. The instructor will present problems; after reflecting on the problem, students submit their responses, and the instructor reviews them without providing a correct answer. Students discuss their thought process and solution with a peer. Students then commit to an answer and re-submits their responses. Instructor reviews responses and thought processes with the correct answer.

Criteria	***% of Grade***
Engagement	100%
TOTAL	**100%**

Discussion Board (DB)

Each week the instructor will post a topic related to AI in industry and AI innovations. Students will engage in the discussion demonstrating their knowledge of the concepts covered each week and how they are applied and integrated in developing back-end applications.

All classes are required to use the Discussion Board. Participation through DB is an integral part of this course. It is defined as active engagement in a discussion or other activity. Instructors will determine the type of activities and their due dates; moreover, different DB activities will have different substance and length guidelines. The instructor will provide specific instructions to students.

A student posts an answer to a weekly discussion topic in Discussion Board. The student also posts a response to two other students' posts by the end of each module. Comments and questions should be clear and thoughtful, with correct grammar, spelling, and punctuation. The instructor will grade the quality of the discussion postings on both content and response.

Questions or comments specifically for the instructor should be emailed directly to the instructor or posted in the Question and Answer Forum. Students who want to talk with other students about issues unrelated to the discussion forums should use the Coffee Talk Forum.

Although the DB postings' tone can be informal, the instructor will expect the content to be on a professional level. Student comments and questions for discussion should be clear and thoughtful, with correct grammar, spelling, and punctuation. As with written assignments, the discussion postings' quality will be graded on both content and presentation.

Criteria	***% of Grade***
Participation	50%
Writing	50%
TOTAL	**100%**

Hands-on Skills (HOS)

The instructor will assign Hands-on Skill exercises to solve various problems. Students will install tools such as PyTorch and complete exercises using the tools. Students can work in pairs in class, or individually online. For example, students will use current applications used in industry to complete the programming exercises and complete the team project.

Criteria	**% of Grade**
Practice Exercise	80%
Engagement	20%
TOTAL	**100%**

Virtual Lab (VL)

Students will complete a set of Virtual Labs using environments such as Azure AI workloads or Google Colab. Knowledge of the applications and how they are used to solve industry problems will help students with design and development of their team project. The labs must be individually performed. Programs must be executable and robust.

Programs should deliver correct answers on all valid input and produce comprehensible error messages on invalid input. Programs also run correctly on all test data given within a reasonable amount of time. Students should write programs that are easy for other people to read.

Criteria	***% of Grade***
Program Execution	40%
User Requirement	40%
Program Documentation	20%
TOTAL	***100%***

Knowledge Check (KC)

Students will demonstrate their understanding, how AI is used to solve common problems such a prediction/forecasting, anomaly detection, and conversational applications, through weekly quizzes. These weekly quizzes focus on the underlying principles and concepts rather than memorization to solve the quizzes.

Criteria	***% of Grade***
Correctness	100%
TOTAL	**100%**

Team Project (TP) – Using one of the tools introduced in the HOPs and VLs, students will investigate various problems that AI algorithms are solving today and implement a solution by designing a common AI workload to solve the problem. For example, students can look at conversational AI, or anomaly detection. Students will be expected to identify issues that have been experienced using the technology and apply guiding principle for best practice. Final project report needs to include background to the AI solution, current practices and use cases, future application, ethical implications.

Students can work on a specific project, but it must be approved by the instructor and be relevant to the course. Each project consists of four elements: a proposal, a progress report, a final report of 6-7 pages, and a final presentation with slides. Templates will be provided for each element by the instructor. Students will add to their project elements weekly, incorporating feedback from their instructor.

Students are expected to use evidence to support the contentions they have drawn from their findings and critically analyze their cited resources. Resources should include assigned course materials and additional sources students have investigated and researched not assigned by the professor. Students will use industry technical style of reporting and are expected to employ APA formatting for citations and references.

The instructor will provide specific team project requirements in the course shell.

TP Report

The student will provide a report formatted based on a template provided by the instructor. Students are required to improve the writing iteratively and incrementally every week. The revision will always happen during a quarter. Students will add new required sections to the existing paper every week.

The final report is the culmination of applied research and activities conducted throughout the quarter. The final report/paper provides a detailed problem and its solution likely to be encountered by a company or organization described in a case study supplied by the student.

Rubric for TP01 and TP02

Criteria	*% of Grade*
Structure	20%
Content	30%
Writing	30%
Reference	10%
Collaboration	10%
TOTAL	100%

Rubric for TP03

	Criteria	*Outcome*	*% of Grade*
Artificial Intelligence Overview (20%)			
1	Artificial Intelligence Overview	Apply the knowledge to identify how AI is used today and in near future.	20%
Critical Thinking (60%)			
2	Issue	Issue is stated and described thoroughly so that it is understood fully.	20%
3	Evidence	Information is taken from source(s) appropriate to the scope with enough interpretation and evaluation to develop a comprehensive analysis or synthesis, and expert opinions are thoroughly scrutinized.	10%
4	Context and Awareness	Thoroughly analyzes assumptions and biases, carefully evaluating contextual relevance when presenting a position.	20%
5	Conclusions	Conclusions are logical and reflect an informed evaluation of evidence and perspectives in priority order.	10%
Collaboration (20%)			
6	Teamwork	Works effectively on diverse, global and/or distributed teams.	10%
7	Knowledge of Cultural Frameworks	Demonstrates sophisticated understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy, or beliefs and practices.	5%
8	Openness to Cultural Differences	Demonstrates sophisticated understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy, or beliefs and practices.	5%
	TOTAL		100%

TP Presentation
The student will report the research outcomes, development, or other project efforts to an academically appropriate committee in a public forum. The nature of the presentation content will determine the specific makeup of the audience. The student will choose the format of the presentation in consultation with the advisor. The layout and design must be appropriate and adequate to represent the outcomes of the effort. While students must make some form of a visual presentation, the presentation of the results may include publishing in a refereed publication, publication in a trade or popular magazine or journal, broadcast in an appropriate medium, or, in exceptional cases, limited dissemination within a closed community.

Each presenter will have 15 minutes for presentation and 5 minutes for questions and answers. Each presenter must keep the total presentation time limit strictly.

Criteria	***% of Grade***
Structure	20%
Visual Presentation	30%
Verbal Quality & Engagement	30%
Collaboration	20%
TOTAL	100%

Course Policies

Course policies on Late Assignments, Participation, and Professional Writing are found under Course Information in the online course menu. Students are responsible for reviewing and applying these policies while enrolled in this course.

University Policies

You are responsible for understanding and adhering to all of City University of Seattle's academic policies. The most current versions of these policies can be found in the University Catalog that is linked from the CityU Web site.

Antidiscrimination
City University of Seattle and its staff and faculty are committed to supporting our students. We value equity, diversity, and inclusion as a way of life as well as the educational opportunities it provides. City U will not tolerate any form of discrimination based on race, color, ethnicity, sexual orientation, gender identification, socioeconomic status, or religious values. If you have experienced any discrimination based on any of the above, we encourage you to report this to the University. Please report this to your instructor. If you do not feel safe reporting this to your instructor, please report to Dr. Scott Carnz, Provost or to the Vice President of Student Affairs, Melissa Mecham.

Non-Discrimination & Prohibition of Sexual Misconduct
City University of Seattle adheres to all federal, state, and local civil rights laws prohibiting discrimination in employment and education. The University is committed to ensuring that the education environment is bounded by standards of mutual respect and safety and is free from discriminatory practices.

In the U.S., the University is required by Title IX of the Education Amendments of 1972 to ensure that all of its education programs and activities do not discriminate on the basis of sex/gender. Sex include sex, sex stereotypes, gender identity, gender expression, sexual orientation, and pregnancy or parenting status. Sexual harassment, sexual assault, dating and domestic violence, and stalking are forms of sex discrimination, which are prohibited under Title IX and by City University of Seattle policy. City University of Seattle also prohibits retaliation against any person opposing discrimination or participating in any discrimination investigation or complaint process internal or external to the institution. Questions regarding Title IX, including its application and/or concerns about noncompliance, should be directed to the Title IX Coordinator. For a complete copy of the policy or for more information, visit https://my.cityu.edu/titleix or contact the Title IX Coordinator.

In Canada, in compliance with the British Columbia Human Rights Code, the Alberta Human Rights Act, WorksafeBC, and the Workers' Compensation Board of Alberta, the University believes that its environment should at all times be supportive and respectful of the dignity and self-esteem of individuals. Discrimination, harassment and bullying conduct, whether through person to person behaviour or via electronic communications such as email or social media is not acceptable and will not be tolerated. As an educational institution, it is our responsibility to cultivate an environment of excellence, equity, mutual respect and to recognize the value and potential of every individual. The University will take all necessary steps to meet or exceed the requirements of the law to prevent discrimination, harassment and bullying. The Respectful Workplace Policy for the prevention of discrimination, harassment and bullying policy and procedure can be found at https://www.cityu.edu/discover-cityu/about-cityu/ under the Policies section or at https://www.cityuniversity.ca/about/ .

Religious Accommodations
City University of Seattle has a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The University's policy, including more information about how to request an accommodation, is available in the University Catalog and on the my.cityu.edu student portal. Accommodations must be requested by the 20% mark of this course (e.g. day 14 of a ten-week course, day 7 of a 5-week course) using the Religious Accommodations Request Form found on the student dashboard in the my.cityu.edu student portal.

Academic Integrity
Academic integrity in students requires the pursuit of scholarly activity that is free from fraud, deception and unauthorized collaboration with other individuals. Students are responsible for understanding CityU's policy on academic integrity and adhering to its standards in meeting all course requirements. A complete copy of this policy can be found in the University Catalog in the section titled *Academic Integrity Policy* under *Student Rights & Responsibilities*.

Attendance
Students taking courses in any format at the University are expected to be diligent in their studies and to attend class regularly. Regular class attendance is important in achieving learning outcomes in the course and may be a valid consideration in determining the final grade. For classes where a physical presence is required, a student has attended if they are present at any time during the class session. For online classes, a student has attended if they have posted or submitted an assignment. A complete copy of this policy can be found in the University Catalog in the section titled Attendance under Student Rights & Responsibilities.

Final Assignments Due Date
Final assignments for each class at CityU must be due on or before the final date of the course as indicated in the university's course information system. Due dates that extend beyond the final date of the course may negatively impact tuition funding for students.

Support Services

Disability Services & Accommodations

Students with a documented disability who wish to request academic accommodations are encouraged to contact Disability Support Services to discuss accommodation requests and eligibility requirements. Please contact Disability Support Services at *disability@cityu.edu* or 206.239.4752 or visit the Disability Support Services page in the my.cityu.edu portal. Confidentiality will be observed in all inquiries. Once approved, information about academic accommodations will be shared with course instructors.

Library Services
CityU librarians are available to help students find the resources and information they need to succeed in this course. Contact a CityU librarian through the Ask a Librarian service, or access library resources and services online, 24 hours a day, seven days a week.

Smarthinking Tutoring
CityU students have 24/7 access to free online tutoring offered through Smarthinking, including writing support, from certified tutors. Contact CityU's Student Support Center at mycityusupport@cityu.edu to request a username and password.