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Syllabus

AI 430: Current Topics in Artificial Intelligence

School of Technology & Computing

5 Credits, Undergraduate Course
Grading Type: Decimal Grade
Pre-requisite, Co-requisite: None
Spring 2023

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 enables students to explore cutting edge AI research, AI trends and solutions, in depth, building on the concepts learned. As AI innovations continue to grow exponentially, topics covered include innovative NLP solutions, robotics, computer vision and ethical AI across industries such as ocean, agriculture, advanced manufacturing, digital technology, and computational genomics. Students research different approaches and create a functional product in an agile team focusing on solving a specific current or future problem.

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 Desire to Learn LMS, 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

This course will prepare students to:

1. Explain current AI research topics and their future applications.
2. Examine cutting edge AI research technologies and trends.
3. Examine the state of AI in verticals such as medicine, entertainment, transportation, cybersecurity, and home market/vital tasks.
4. Apply use cases from research findings and investigate AI solutions.
5. Analyze AI technological innovations and tools for future AI applications.
6. Design industry solution to address future AI applications and implement a prototype application using a cloud AI framework and services.

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
Major Assignments	***70%***	
Hands-On Practice (HOP)	20%	200 = 20 points * 10 modules
Programming Exercise (PE)	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)

This activity ensures students engage in the course and examine and understand new AI technologies and their applications. The instructor uses the MP to assess how students understand 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 understands 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 understands the required readings.

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

Concept Test (CT)

The concepts tests reinforce lectures and readings asking students to reflect on specific aspects of current AI research trend and their future applications used in industry and business. Students discuss their thought process and solution with a peer. Students then commit to an answer and re-submit their responses. Instructor reviews the responses provides feedback.

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

Discussion Board (DB)

Each week, the instructor posts a topic related to use case studies and research findings and AI applications. Students engage in discussion demonstrating their knowledge of the concepts covered each week and how they are applied and integrated AI 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 determine the type of activities and their due dates; moreover, different DB activities have different substance and length guidelines. The instructor provides 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 grades the quality of discussion postings on both content and response.

Questions or comments specifically for the instructor should be emailed directly to the instructor.

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

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

Hands-On Practice (HOP)

The instructor assigns Hands-On Practice exercises using current tools and deep learning algorithms. Students can work in pairs in class, or individually online. For example, students use the following applications required to complete the programming exercises and complete the team project.

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

Programming Exercises (PE)

Students complete a set of programming exercises using specific industry tools such as Scikit-Learn, PyTorch, or Azure AI Workloads to examine programs and solutions used in industry and business to investigate AI algorithm to solve future problems. These exercises help students with design and development of the project. The programming exercise must be individually performed. Programs must be executable and robust.

Programs should deliver correct answers to 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.

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

Knowledge Check (KC)

Students demonstrate their understanding of AI applications used in robotics, computer vision, home help market and NLP, tools and use cases, through weekly quizzes. These weekly quizzes focus on the underlying principles and concepts rather than memorization to solve the quizzes.

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

Team Project (TP) – – **Addressing current / near future industry or business problem by designing a deep learning AI solution.**

Using the knowledge acquired through lectures, practical tools implementation and exercises in HOPs and PEs, students research a current or new problem facing society such as use of robotics, business problems such as crop yields or stock market predictions, or responsible social issues facing education, home help market and HR. Teams are required to design and implement a prototype solution. Students test the prototype, and if feasible, update it or make recommendations for future updates and implementations. Students identify guiding principles for responsible AI including fairness, inclusiveness, transparency, accountability, privacy, and security

Teams need to set up data storage, a development environment, scheduling for training and scoring, cluster management, and predict management costs. Deep learning solutions are not easy to configure, planning is key. The final report accounts for all components listed.

Proposed use cases or a completely different project must be first approved by the instructor. 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 are provided for each element by the instructor. Students add to their project elements weekly, incorporating feedback from their instructor.

Students 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 use technical writing style of reporting using APA formatting for citations and references.

The instructor provides specific team project requirements in the course shell.

TP Report

The students submit a report formatted based on a template provided by the instructor. Students are required to improve writing iteratively and incrementally every week. Students 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.

Grading for TP01 and TP02

TP 01 & 02 Criteria	***% of Grade***
Structure	20%
Content	30%
Writing	30%
Reference	10%
Collaboration	10%
TOTAL	100%

Rubric for TP03

	TP03 Criteria	***Outcome***	***% of Grade***
Natural Language Programming Principles and Practices (20%)			
1	Current Topics in Artificial Intelligence	Apply current topics in AI to solve implement AI solutions.	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,	5%

		politics, communication styles, economy, or beliefs and practices.	
	TOTAL		100%

TP Presentation

The Team report the research outcomes, development, or other project efforts to an academically appropriate committee in a public forum. The nature of the presentation content determine the specific makeup of the audience. The students 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 Team has 15 minutes for presentation and 5 minutes for questions and answers. Each presenter must keep the total presentation time limit strictly.

TP Presentation 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.