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Syllabus

# AI 620 Emerging Topics in Artificial Intelligence

# School of Technology & Computing

3 Credits, Graduate Course

Grading Type: Decimal

*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 can be found under Content à Syllabus, Schedule, and Course Team à Meet Your Instructor in the online course menu.

# **Contact Information**

Contact information for instructors can be found in the online course menu. Additional contact information regarding the Student Worker for the course, the Program Manager, Program Director and Dean is also shared in the same location. Hyperlinks on the contact page direct students to the responsible party's weekly office hours.

# **Course Description**

As AI innovations continue to bring new solutions, students need to understand the speed of AI adaptation. This course provides students opportunities to explore AI trends and solutions in depth, building on the concepts learned. Topics such as implementing computer vision solutions, NLP solutions, knowledge mining, conversational AI, robotics, ethical AI frameworks, and security configuration for various AI services in a virtual network will be covered.  Candidates will research innovative strategies to plan for future workforce and implement a project focusing on a specific problem and solution.

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 Desires 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.

A $5.00 instructional course material fee is added to the course. Complete instructions will be provided in the course shell.

# **Course Outcomes**

At the end of this course, students:

1. Explain current AI research topics and their future applications.
2. Examine current uses of AI technologies and their advances.
3. Apply use cases from research findings and identify AI solutions and potential problems in technological and social context.
4. Analyze technological needs, methods, and tools for future AI applications.
5. Evaluate the state of AI in ‘4IR’ (fourth industry revolution) / ‘Industry 4.0’ in medicine, entertainment, transportation, cybersecurity, and home market/vital tasks.
6. Design industry solution to address 4IR 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.

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| **OVERVIEW OF REQUIRED ASSIGNMENTS** | **% OF FINAL GRADE** | **POINTS** |
| ***Instructor Determined Assignments*** | ***20%*** |  |
| The Muddiest Point (MP) | 5% | 50 = 5 points \* 10 modules |
| Concept Debate (CD) | 5% | 50  = 5 points \* 10 modules |
| Knowledge Check (KC) | 10% | 100 = 10 points \* 10 modules |
| **M*ajor Assignments*** | ***80%*** |  |
| Hands-On Skills (HOS) | 20% | 200 = 20 points \* 10 modules |
| Programming Exercise (PE) | 40% | 300 = 40 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) & Concept Debate (CD)**

All classes are required to use the Discussion Board to participate in MP and CD. Participation is an integral part of this course. It is defined as active engagement in discussing the MP and CD.

A student posts an answer to a weekly discussion topic on 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 your discussion postings on both content and response. References for your answers are strongly recommended. But APA styles are required for references and citations.

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

**MP:** Before class, students are required to submit the Muddiest Point (MP) activity. The purpose of this activity is to stimulate student engagement. 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 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.

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| ***Criteria*** | ***% of Grade*** |
| Participation | 80% |
| Writing | 20% |
| **TOTAL** | **100%** |

**CD:**The instructor poses a problem based on the key concepts of a lecture. After reflecting on the problem, students submit their first answer with justification identifying why the answer is correct. Then, students discuss their responses with their classmates. Students discuss their thought processes and solutions with peers. Students then commit to an answer and re-submit their responses. The instructor reviews responses and thought processes with the correct answer through Weekly Announcements.

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

Please note that copying a segment of code from the Internet and submitting it as your work is considered plagiarism.

**Hands-On Skills (HOS)**

The instructor assigns Hands-on Skill exercises to practice writing programs and using software tools currently used in industry AI. These exercises prepare students for the Programming Exercises and the Team Project. Students can work in pairs or individually online.

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| ***HOS Criteria*** | ***% of Grade*** |
| Practice Exercise | 90% |
| Correctness | 10% |
| **TOTAL** | **100%** |

**Programming Exercise (PE)**

The students must individually perform the programming exercise. Programs must be executable and robust. Non-executable programs will not receive any credits. 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 an assigned period. Students should write programs that are easy for other people to read.

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

Please note that copying a segment of code from the Internet and submitting it as your work is considered plagiarism.

**Knowledge Check (KC)**

Students demonstrate their understanding of how AI can solve current and future industry and business problems. These weekly quizzes focus on the underlying principles and concepts rather than memorization to solve the quizzes.

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

**Team Project (TP)** – **Implementing Artificial Intelligence Algorithm to Cloud Platform**

First find an applicable area where an AI algorithm can be applied and iterated on AWS platform. Once the goal of the project has been set, the models need to be developed and tested on different datasets on cloud platform. There are various publicly available datasets, find one that has data that suits your project. Finding publicly available data that can be used for the project is a very important step in getting the project done appropriately. I encourage you to take a look at [Kaggle](https://www.kaggle.com/datasets) to see available datasets that can give you some ideas in selecting the team project topic. Please have one team member send the instructor information on the team project topic for confirmation to get started on the project and the project proposal.

A team proposed 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 elements to their project 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 can use their own format, though all components included in the template, outlined in the agenda need to be covered. Students improve their writing iteratively and incrementally every week based on the feedback received from the instructor, adding new required sections to the existing paper with every deliverable.

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 encountered in organizations.

**TP01 & TP02**

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| ***TP01 & TP02 Criteria*** | ***% of Grade*** |
| Structure | 20% |
| Content | 25% |
| Writing | 20% |
| Reference | 10% |
| Collaboration | 25% |
| **TOTAL** | 100% |

**TP03**

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| ***TP03 Criteria*** | ***% of Grade*** |
| Structure | 20% |
| Emerging Topics in Artificial Intelligence | 20% |
| Writing | 20% |
| Reference | 15% |
| Collaboration | 25% |
| **TOTAL** | 100% |

**TP Presentation**

The Team reports research outcomes, development, or other project efforts to an academically appropriate committee in a public forum. The nature of the presentation content determines the specific makeup of the audience. The Team chooses the format of the presentation in consultation with the advisor. The layout and design must be appropriate and adequate to represent the outcome 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 a presentation and 5 minutes for questions and answers.  Each presenter must keep the total presentation time limit strictly.

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

COURSE POLICIES

Course policies on topics such as 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.

In the School of Technology and Computing, this policy underscores the importance of responsible use of learning language models, like ChatGPT or Bard, in academic pursuits. While these models can be valuable for grammar and proofreading, they must not replace the fundamental processes of learning, researching, critical thinking, and problem-solving. Students are encouraged to utilize these tools only for grammar and proofreading, with accurate references.

UNIVERSITY POLICIES

Students 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](http://www.cityu.edu/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 Interim Provost or to the Vice President of Student Affairs, Dr. 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://www.cityu.edu/about-cityu/student-right-to-know/](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.cityu.edu%2Fabout-cityu%2Fstudent-right-to-know%2F&data=05%7C01%7Cmaengjooyol%40cityu.edu%7C057e03ca276a44e450cd08db1526fc5b%7Cb3fa96d9f5154662add763d854e39e63%7C1%7C0%7C638127029438164497%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=78Z2BR8v%2Fh8iq2Klj6K%2FlI0NWFYGwsQQgrBWVQK7M8E%3D&reserved=0) 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 always be supportive and respectful of the dignity and self-esteem of individuals. Discrimination, harassment and bullying conduct, whether through person to person behaviors 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/](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.cityu.edu%2Fdiscover-cityu%2Fabout-cityu%2F&data=04%7C01%7Ckhamesipourali%40cityu.edu%7C741ea0bde0d547ab50e008d90c379e4f%7Cb3fa96d9f5154662add763d854e39e63%7C1%7C0%7C637554255311950002%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=Vn%2FpStd1%2FY%2Fm1qmuPrAzLwlWNrhM4m9%2Bfo6WUhHeHFs%3D&reserved=0)  under the Policies section or at [https://www.cityuniversity.ca/about/](https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.cityuniversity.ca%2Fabout%2F&data=04%7C01%7Ckhamesipourali%40cityu.edu%7C741ea0bde0d547ab50e008d90c379e4f%7Cb3fa96d9f5154662add763d854e39e63%7C1%7C0%7C637554255311950002%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=38Xgn6Hz8hLjq2SAEqihnpAzx5VQSAKnoCO70lDSKdQ%3D&reserved=0).

**Title IX Statement**

City University of Seattle and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If students have encountered any form of sexual misconduct (e.g., sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage them to report this to the University. If a student speaks with a faculty member about an incident of misconduct, that faculty member must notify CityU’s Title IX coordinator and share the basic fact of the experience. The Title IX coordinator will then be available to assist students in understanding all the options and in connecting students with all possible resources on and off campus.

To view CityU’s sexual misconduct policy and for resources, please visit the [Title IX](https://www.cityu.edu/about-cityu/student-right-to-know/) and [Campus Safety](https://www.cityu.edu/about-cityu/student-right-to-know/) pages in the my.cityu.edu portal.

**Religious Accommodations**

Washington state law requires that City University of Seattle develop 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. Accommodations must be requested within the first two weeks of this 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](http://www.cityu.edu/catalog/) under *Student Rights and Responsibilities* on the page titled *Academic Integrity Policy.*

**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 in the [University Catalog](http://www.cityu.edu/catalog/) under *Student Rights and Responsibilities* on the page titled *Attendance.*

**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 Statement**

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*](mailto:disability@cityu.edu) or 206.239.4752 or visit the [Disability Support Services](https://my.cityu.edu/pages/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 Librarianservice](https://cityu-seattle.libanswers.com/), or access [library resources and services online](http://library.cityu.edu/), 24 hours a day, seven days a week.

**Online Tutoring**

CityU students have access to free online tutoring offered through Brainfuse, including writing support, from certified tutors 24 hours a day, seven days a week. Visit the [Brainfuse](https://my.cityu.edu/pages/tutoring-resources) page on the my.cityu.edu portal for more information.