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CS4442/9542 Course Outline

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1. Course Information

Course Information

Artificial Intelligence II (4442), Winter 2022, the lectures will be held online and synchronous via Zoom until January 31, 2022, Mondays 9:30 – 11:30 AM, Wednesdays 9:30 -10:30 AM.

We hope to return to the in-person teaching after January 31, but it is possible that we will need to extend the delivery of classes virtually beyond January 31.

List of Prerequisites

Mathematics 1600A/B or Applied Mathematics 1411A/B, and Computer Science 3307A/B/Y or Software Engineering 3350A/B.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Dr. Boyu Wang, bwang@csd.uwo.ca

Dr. Brent Davis, bdavis56@uwo.ca

Prof. Boyu Wang Office Hours: Wednesdays at 10:30 to 11:30 PM (right after the lecture) or by appointment on Zoom

Zoom link to office hours: <https://westernuniversity.zoom.us/j/91355671070> (no passcode)

Prof. Brent Davis Office Hours: Tuesday 1:00 to 3:00 PM on Zoom

Zoom link to office hours: <https://westernuniversity.zoom.us/j/97204713542> (Passcode: 145482)

Students must use their Western (@uwo.ca) email addresses when contacting their instructors. The students should include the course number in the subject line of the email and what the email is related to. For example: CS4442 – assignment 1.

3. Course Syllabus, Schedule, Delivery Mode

This course is a continuation of CS3346, Artificial Intelligence I. A broad range of areas falls into the field of Artificial Intelligence. In this course we give a brief introduction to two very active areas of Artificial Intelligence: machine learning and deep learning with applications in computer vision and/or natural language processing. The programming assignments will be done in Matlab/Python. During this course we will study both algorithmic perspectives of artificial intelligence and their practical applications.

Artificial Intelligence II (4442), Winter 2022, the lectures will be held online and synchronous via Zoom, Mondays 9:30 – 11:30 AM, Wednesdays 9:30 -10:30 AM.

Zoom link for class lectures: <https://westernuniversity.zoom.us/j/91355671070> (no passcode)

Classes begin: January 10

Reading Week: February 19 - 27

Classes end: April 8

Contingency plan for an in-person class pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructors.

4. Course Materials

There is no required textbook. However, there are several good machine learning and computer vision textbooks describing parts of the material that we will cover.

- Mitchel, "Machine Learning", McGraw-Hill, 1997
- Forsyth and Ponce, "Computer Vision: A Modern Approach", Prentice Hall, 2002
- Goodfellow, Bengio, Courville, "Deep Learning", MIT Press, 2016
- Bishop, "Pattern Recognition and Machine Learning", Springer, 2006.
- Murphy, "Machine Learning: a Probabilistic Perspective", MIT Press, 2012.

Individual papers or web resources may be assigned to supplement lecture material.

Students should check OWL (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

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All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Technical Requirements

The students need to have access to stable internet connection, computer with working microphone and/or webcam.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Undergrad students:

Assignments (4) 60%

Final Project 40%

Graduate students:

Assignments (4) 40%

Project Presentation 10%

Final Project 50%

Undergraduate students will write submit the report of their final project. Graduate students will present their final project and submit a report of their final project.

Tentative Timetable:

Assignment 1: Release: Jan 26 Due: Feb 6

Assignment 2: Feb 7, Due: Feb 17

Assignment 3: March 11th, Due: March 25th

Assignment 4: March 28, Due: April 8th

Final Project:

The project is to be completed in groups of two-three graduate students or two-four undergrad students. Students who are working for their research on problems that are amenable to machine learning solutions are strongly encouraged to formulate a project related to their work. Students who do not have such problems should contact Boyu and/or Brent to discuss possible projects.

Undergraduate students will be required to write a project report.

Graduate students will be required to write a project report, and to do a final project presentation (10 minutes per team). The presentations will be scheduled in the last week of class, during of the class time.

For undergrad students, final project will be due on April 8th.

For graduate students, final project report will be due on May 8th.

In order to do pass the course,

- Undergraduate students must obtain at least 50% score in this course. They must do the final project and they must at least obtain half of the assignments score.
- Graduate students must obtain at least 60% score in this course. They must present their final project and write the final report, and they must obtain at least half of the assignments score.

Accommodated Evaluations

10% of each assignment will be taken off each day for late submissions; after 5 days being late, no points are given anymore.

6. Student Absences

Academic Consideration for Student Absences

Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- (i) Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:
 - an absence must be no more than 48 hours
 - the assessments must be worth no more than 30% of the student's final grade
 - no more than two SRAs may be submitted during the Fall/Winter term

- (ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.
- (iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

and for the Student Medical Certificate (SMC), see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

6. Accommodation and Accessibility

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on

Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf,

7. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Completion of this course will require you to have a reliable internet connection and a device that meets the system requirements for Zoom. Information about the system requirements are available at the following link:

<https://support.zoom.us/hc/en-us>

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at (519) 661-2147 if you have any questions regarding accommodations.

Students who are in emotional/mental distress should refer to Mental Health@Western (<http://www.health.uwo.ca/mentalhealth>) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.