School of
Engineering and Computer Science
Te Kura Mātai Pūkaha, Pūrorohiko

Prescription

This course addresses concepts and techniques of artificial intelligence (AI). It provides a brief overview of AI history and search techniques, as well as covering important machine learning topics and algorithms with their applications, including neural networks and evolutionary algorithms. Other topics include probability and Bayesian networks, planning and scheduling. The course will also give a brief overview of a selection of other current topics in AI.

Course learning objectives

Students who pass this course will be able to:

1. Explain fundamental concepts and techniques of artificial intelligence, particularly in areas of advanced search, machine learning, reasoning under uncertainty, planning and scheduling.
2. Apply fundamental concepts and techniques of artificial intelligence to real world problems in regression, classification, clustering and simple planning tasks.
3. Critically evaluate AI techniques described in AI research publications.

Course content

2022: The course is primarily offered in-person, and there are components such as tests, labs, tutorials, and marking sessions which require in-person attendance. There will be remote alternatives for all the components of the course, but these are only available to students studying from outside the Wellington region. The remote option for tests will use a Zoom-based system for online supervision of the tests.

Students taking this course remotely must have access to a computer with camera and microphone and a reliable high speed internet connection that will support real-time video plus audio connections and screen sharing. Students must be able to use Zoom; other communication applications may also be used. A mobile phone connection only is not considered sufficient. The comuputer must be adequate to support the programming required by the course: almost any modern windows, macintosh, or unix laptop or desktop computer will be sufficient, but an Android or IOS tablet will not.
==========

Artificial Intelligence (AI) is intelligence exhibited by machines. Examples include self-driving cars, automatically planning a holiday, generating sensible conversation, learning to predict fog at Wellington Airport, reading a web page to get the answer to a question, recognising handwritten digits, detecting identity by checking fingerprints, detecting network intrusions, controlling robot actuators, processing and recognising images and signals, discovering and detecting the mathematical or logical relationship between output variables and a large number of inputs in economic and engineering tasks, or optimising parameter values in complex engineering problems. AIML 420 is an introduction to the ideas and techniques that computer scientists have developed to address these kinds of tasks.

The lectures cover following main topics: search techniques, machine learning including basic learning concepts and algorithms, neural networks and evolutionary learning, reasoning under uncertainty, planning and scheduling, knowledge based systems and AI Philosophy. The course includes a substantial amount of programming. The course will cover both science and engineering applications.

Withdrawal from Course

Withdrawal dates and process:
https://www.wgtn.ac.nz/students/study/course-additions-withdrawals

Lecturers

Dr Yi Mei (Coordinator)

yi.mei@vuw.ac.nz 04 886 5331

CO 353 Cotton Building (All Blocks), Gate 7, Kelburn Parade, Kelburn

Dr Andrew Lensen

andrew.lensen@vuw.ac.nz 04 886 5336

CO 354 Cotton Building (All Blocks), Gate 7, Kelburn Parade, Kelburn

Fangfang Zhang

fangfang.zhang@vuw.ac.nz

Prof Mengjie Zhang, for some tutorials and guest lectures.

Dr Fangfang Zhang, for some tutorials and guest lectures.

Teaching Format

This course will be offered in-person and online. For students in Wellington, there will be a combination of in-person components andweb/internet based resources. It will also be possible to take the course entirely online for those who cannot attend on campus, with all the components provided in-person also made available online.

Two lectures and one tutorial per week.

Student feedback

Student feedback on University courses may be found at:
www.cad.vuw.ac.nz/feedback/feedback_display.php

Dates (trimester, teaching & break dates)

- Teaching: 28 February 2022 - 03 June 2022
- Break: 11 April 2022 - 24 April 2022
- Study period: 06 June 2022 - 09 June 2022
- Exam period: 10 June 2022 - 25 June 2022

Class Times and Room Numbers

28 February 2022 - 10 April 2022

- **Monday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn
- **Tuesday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn
- **Friday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn

25 April 2022 - 05 June 2022

- **Monday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn
- **Tuesday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn
- **Friday** 13:10 - 14:00 – LT205, Hugh Mackenzie, Kelburn

Other Classes

There will be some scheduled helpdesks.

Set Texts and Recommended Readings

Required

There is not require textbook for COMP307. You can learn all the course content from the lecture notes and slides.

Recommended

A highly recommended reading is the book: Stuart J. Russell and Peter Norvig, *Artificial Intelligence. A Modern Approach*, Prentice-Hall, NJ (Available from Vic Books, or you can seek out alternate options or e-books from any publisher or supplier available to you.) A lof of content of the course is from this book.

We will also provide a reading list via the course website.

- Stuart J. Russell and Peter Norvig, *Artificial Intelligence. A Modern Approach*, Prentice-Hall, NJ, 3rd edition, 2009. Some online materials are available on the course website.

Mandatory Course Requirements

There are no mandatory course requirements for this course.

If you believe that exceptional circumstances may prevent you from meeting the mandatory course requirements, contact the Course Coordinator for advice as soon as possible.

Assessment

This course will be assessed through four assignments, an essay and two tests. The first three assignments will involve a combination of programming and discussion; the final assignment does not have programming work. The marks and feedback will be returned in two weeks after the submission of each assignment.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Assignment 1 (3~4 weeks)	Week 5	CLO: 1,2	15%
Assignment 2 (3 weeks)	Week 7	CLO: 1,2	12%
Assignment 3 (2~3 weeks)	Week 10	CLO: 1,2	10%
Assignment 4 (2 weeks)	Week 12	CLO: 1,2	8%
Research literature review essay (1,000-2,000 words)	Assessment week	CLO: 3	10%
Test 1	Week 8	CLO: 1,2	10%
Test 2	Assessment week	CLO: 1,2	35%

Penalties

The penalty for assignments that are handed in late without prior arrangement is one grade reduction per day. Assignments that are more than one week late will not be marked.

There are three late days for the assignments. Students can allocate these three days among the assignments freely.

Extensions

Individual extensions will only be granted in exceptional personal circumstances, and should be negotiated with the course coordinator before the deadline whenever possible. Documentation (eg, medical certificate) may be required.

Submission & Return

All work should be submitted through the ECS submission system, accessible through the course web pages. Marks and comments will be returned through the ECS marking system, also available through the course web pages.

Workload

Students are expected to work 10 hours on this course per week, including 3 hours lectures and tutorials.

Teaching Plan

See https://ecs.wgtn.ac.nz/Courses/AIML420_2022T1/LectureSchedule

Communication of Additional Information

1. Course website: https://ecs.wgtn.ac.nz/Courses/AIML420_2022T1/
2. Course forum
3. Email sent by the lecturers to students at their ecs email addresses.

Links to General Course Information

- Academic Integrity and Plagiarism: https://www.wgtn.ac.nz/students/study/exams/integrity-plagiarism
- Academic Progress: https://www.wgtn.ac.nz/students/study/progress/academic-progess (including restrictions and non-engagement)
- Dates and deadlines: https://www.wgtn.ac.nz/students/study/dates
- Grades: https://www.wgtn.ac.nz/students/study/progress/grades
- Special passes: Refer to the Assessment Handbook, at https://www.wgtn.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf
- Statutes and policies, e.g. Student Conduct Statute: https://www.wgtn.ac.nz/about/governance/strategy
- Student support: https://www.wgtn.ac.nz/students/support
- Students with disabilities: https://www.wgtn.ac.nz/st_services/disability/
- Student Charter: https://www.wgtn.ac.nz/learning-teaching/learning-partnerships/student-charter
- Terms and Conditions: https://www.wgtn.ac.nz/study/apply-enrol/terms-conditions/student-contract
- Turnitin: http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin
- University structure: https://www.wgtn.ac.nz/about/governance/structure
- VUWSA: http://www.vuwsa.org.nz

Offering CRN: 33065

Points: 15
Prerequisites: 60 300-level COMP, DATA, SWEN or NWEN pts
Restrictions: COMP 307, COMP 420;
Duration: 28 February 2022 - 26 June 2022
Starts: Trimester 1
Campus: Kelburn