



Prescription

This course addresses evolutionary approaches in machine learning and optimisation. The course will cover both evolutionary algorithms and swarm intelligence as well as some other population-based techniques for problem solving. It will include a range of real-world application domains such as classification, regression, clustering and optimisation.

Course learning objectives

Students who pass this course should be able to:

1. Explain advanced concepts of evolutionary computation and population-based learning, and the advantages and limitations compared to other learning paradigms.
2. Use Evolutionary Algorithm techniques such as genetic algorithms or genetic programming to solve typical regression, classification, clustering, or numeric/combinatorial optimisation problems.
3. Use swarm intelligence techniques such as particle swarm optimisation or differential evolution to solve typical numeric/combinatorial optimisation problems.
4. Use learning classifier systems to solve online learning problems.
5. Apply an understanding of the principles of multi-objective optimisation to solve problems with multiple conflicting objectives and multi-criterion decision making.

Course content

The course is primarily offered in-person. Students who cannot attend in person (e.g., enrolled from overseas) can join the zoom lectures, and obtain the learning materials online.

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 computer 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.

The tests will be run in-person on the Kelburn campus. There will be a remote option for students who cannot attend in-person with a strong justification (for example, being enrolled from overseas). The remote test option will use Zoom for online supervision of the tests and you must be able to use Zoom with a camera, microphone, and screen-sharing. Students who will need to use the remote test option must contact the course coordinator in the first two weeks to get permission and make arrangements.

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Withdrawal from Course

Withdrawal dates and process:

<https://www.wgtn.ac.nz/students/study/course-additions-withdrawals>

Lecturers

Yi Mei (Coordinator)

yi.mei@vuw.ac.nz 04 4635233 ext 8016

353 Cotton, Kelburn

Aaron Chen

aaron.chen@vuw.ac.nz 04 463 5114

405 Alan MacDiarmid Building, Kelburn

Teaching Format

This course will be offered primarily in-person For students in Wellington and can attend on campus, the primary teaching format will be in-person. For students who cannot attend on campus (such as enrolled from overseas), there will be web/internet based resources such as lecture notes, recorded lecture videos and assessments provided online.

Two lectures per week, with associated tests and projects.

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: 05 July 2021 - 08 October 2021
- Break: 16 August 2021 - 29 August 2021
- Study period: 11 October 2021 - 14 October 2021
- Exam period: 15 October 2021 - 06 November 2021

Class Times and Room Numbers

05 July 2021 - 15 August 2021

- **Wednesday** 11:00 - 11:50 – LT103, Hugh Mackenzie, Kelburn
- **Friday** 11:00 - 11:50 – LT103, Hugh Mackenzie, Kelburn

30 August 2021 - 10 October 2021

- **Wednesday** 11:00 - 11:50 – LT103, Hugh Mackenzie, Kelburn
- **Friday** 11:00 - 11:50 – LT103, Hugh Mackenzie, Kelburn

Set Texts and Recommended Readings

Required

There are no required texts for this offering.

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 two projects and two tests.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Project 1 (40-45 hours)	TBC	CLO: 1,2	25%
Project 2 (40-45 hours)	TBC	CLO: 3,4,5	25%
Test 1 (1 hour duration)	TBC	CLO: 1,2	25%
Test 2 (1 hour duration)	TBC	CLO: 3,4,5	25%

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

The student workload for this course is 150 hours.

Teaching Plan

See https://ecs.wgtn.ac.nz/Courses/AIML426_2021T2/LectureSchedule

Communication of Additional Information

All online material for this course can be accessed at https://ecs.wgtn.ac.nz/Courses/AIML426_2021T2/

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-progress> (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: [33068](#)

Points: 15

Prerequisites: AIML 420 or COMP 307

Restrictions: COMP 422;

Duration: 05 July 2021 - 07 November 2021

Starts: Trimester 2

Campus: Kelburn