



The VIU community acknowledges and thanks the Snuneymuxw, Quw'utsun, Tla'amin, Snaw-naw-as and Qualicum First Nation on whose traditional lands we teach, learn, research, live and share knowledge.

## Course Outline

Advanced Topics in Computer Science -- Artificial Intelligence

CSCI 479 (3 credits)

F26N01, F26N02

## Calendar Description

This course examines selected emerging and advanced topics in Machine Learning. Topics may include: predictive model classification (using techniques such as decision tree, Bayesian networks, deep learning, etc.), data association analysis, and clustering/outlier analysis. (3:0:2)

## Delivery Mode

Face-to-face

## Contact hours

3 hours of lecture and 2 hours of lab per week, from September 10<sup>th</sup> to December 11<sup>th</sup>, 2026.

## Prerequisites and Corequisites

Prerequisites: CSCI 162 and CSCI 370

## Course Schedule

- Lectures: 11:30 – 13:00 Mondays and Wednesdays (Building 200 Room 105)
- Labs: 12:30 – 14:30 Fridays for F26N01 (Building 315 Room 115),  
and 14:30 – 16:30 Fridays for F26N02 (Building 315 Room 115)

## Course Topics and their tentative schedule

Dates and topics are approximate and are subject to change.

| Dates  | Topics                                                                                        |
|--------|-----------------------------------------------------------------------------------------------|
| Week 1 | <a href="#">Introduction</a><br><a href="#">Data</a>                                          |
| Week 2 | <a href="#">Information based learning I</a><br><a href="#">Information based learning II</a> |
| Week 3 | <a href="#">Information based learning III</a><br><a href="#">Similarity based learning I</a> |



|         |                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------|
| Week 4  | <a href="#">Similarity based learning II</a><br><a href="#">Probability based learning I</a>    |
| Week 5  | <a href="#">Probability based learning II</a><br><a href="#">Probability based learning III</a> |
| Week 6  | <a href="#">Error based learning I</a><br>Midterm review                                        |
| Week 7  | Midterm<br><a href="#">Error based learning II</a>                                              |
| Week 8  | <a href="#">Error based learning III</a><br><a href="#">Deep Learning</a>                       |
| Week 9  | <a href="#">Error based learning IV</a><br><a href="#">Predictive Model Evaluation</a>          |
| Week 10 | <a href="#">Predictive Model Evaluation</a><br><a href="#">Cluster Analysis I</a>               |
| Week 11 | <a href="#">Cluster Analysis II</a><br><a href="#">Outliers</a>                                 |
| Week 12 | <a href="#">Association I</a><br><a href="#">Association II</a>                                 |
| Week 13 | <a href="#">Association III</a><br><a href="#">Summary/Final Review</a>                         |

## Instructor Info

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|-------------------------------|---------------------------------------|
| Instructor name:              | Huizhu Liu                            |
| Instructor VIU email address: | Huizhu.Liu@VIU.CA                     |
| Office Hours:                 | 9:30 to 11:30, Mondays and Wednesdays |
| Office Location:              | Building 315 Room 211                 |

## Learning Outcomes

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Upon completing this course, students should be able to:

- determine the characteristics of a given problem that machine learning techniques can be applied;
- apply pre-processing techniques to prepare the data to be used by machine learning algorithms;
- select and implement the appropriate machine learning algorithms to build predictive models, or perform data pattern analysis;
- select and apply appropriate machine learning techniques to solve problems;
- evaluate, maintain and evolve predictive models and data patterns learned from the data set.

## Course Learning Materials

- (Optional Textbook) Fundamentals of Machine Learning for Predictive Data Analytics, by John Kelleher, Brian Mac Namee, and Aoife D'Arcy
- (Optional Textbook) Data Mining, Concepts and Techniques, by Jiawei Han and Micheline Kamber
- (Recommended Reading) Artificial Intelligence: A Modern Approach, by S. Russell and P. Norvig

## Evaluation and Assessment

- Assignments -- 30%
- Course Project – 10%
- In-class Midterm -- 20%
- Final Exam -- 40%

**Grade Conversion:** The following grade scale will be used:

| Percentage(%) | Letter Grade | Grade Point |
|---------------|--------------|-------------|
| 90-100        | A+           | 4.33        |
| 85-89         | A            | 4.00        |
| 80-84         | A-           | 3.67        |
| 76-79         | B+           | 3.33        |
| 72-75         | B            | 3.00        |
| 68-71         | B-           | 2.67        |
| 64-67         | C+           | 2.33        |
| 60-63         | C            | 2.00        |
| 55-59         | C-           | 1.67        |
| 50-54         | D            | 1.00        |
| 0-49          | F            | 0.00        |

### Extra notes on evaluation and assessment:

- The instructor reserves the right to modify this grading scheme during the term as necessary.
- All the course works must be done by students individually and independently.
- To pass the course, your weighted exam average must be a passing mark.
- No late submissions unless they are approved by the instructor before the due date/time of the corresponding submission.
- If you miss a test, details of your absence may be shared with the S&T Dean's Office where it will be confidentially tracked. The Dean, or their designate, may reach out to you for more information related to your absence and to connect you with an appropriate student

## Appeals of Grades:

Any exercise or examination grade may be appealed. However, the appeal must be made to the instructor, in writing and attached to the work in question, and within 7 days of the grade being made available to the class. The instructor reserves the right to re-grade the entire piece of work submitted on appeal, not necessarily just the component that the student believes is in error.

## Resources

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- Link to Faculty website
- [VIULearn](#)
- [Library](#)
- [Academic Advising](#)
- [Writing Centre](#)
- [Math Learning Centre](#)
- [Services for Aboriginal Students](#)
- [Counseling Services](#)
- [Accessibility](#)
- [Registration](#)
- [VIU Students' Union](#)

## Accessibility

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Vancouver Island University recognizes its legal duty to provide educational opportunities that enable students with a documented disability to access courses, programs, facilities, and services.

The Policy and Procedural Guidelines apply to all students who have identified themselves to the institution as having a documented disability who are inquiring about, applying to, or registered in credit or non-credit courses in both on and off-campus programs.

- [Policy 32.02 - Services Available to Students with a Documented Disability](#)

## Academic Integrity

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Integrity in academic work is a central element of learning and is the basis of intellectual pursuits in any academic community. It is also your responsibility to abide by the Student Conduct Code and Student Academic Code of Conduct.

- [Academic Integrity](#)

## Links University Policies, Standards, and Guidelines

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- [University Policies](#)
- [Freedom of Information and Protection of Privacy](#)
- [Student Conduct and Care \(SCC\)](#)
- [Student Academic Code of Conduct](#)
- [Student Affairs](#)
- [Academic Regulations](#)
- [Equity, Diversity, and Inclusion \(EDI\)](#)