



# THE UNIVERSITY OF WINNIPEG

## APPLIED COMPUTER SCIENCE DEPARTMENT

### GACS-7401-002 – Current Topics in Computing (Advanced Machine Learning)

#### **Instructor Information**

**Instructor:** Dr. Sheela Ramanna                      **Office:** 3D15  
**E-mail:** s.ramanna@uwinnipeg.ca                      **Office Hours:** Thursday 2:30-3:30  
**Class Meeting Time:** T, Th 11:30- 12:45                      **Room No:** 3D03  
**Course Web page:** <http://www.acs.uwinnipeg.ca/7401>

#### **Important Dates**

- Final Withdrawal Date w/o academic penalty: March 1. (A minimum of 20% of the work on which the final grade is based will be evaluated and available to the student before the voluntary withdrawal date)
- Reading Week Break: Feb 19 -25(No classes)
- Project Proposal Presentation: January 27
- Quiz 1: February 2
- Quiz 2: March 2
- Quiz 3: March 28
- Final Project Presentations: April 11

#### **Additional Course Related Information**

1. When it is necessary to cancel a class due to exceptional circumstances, instructors will make every effort to inform you via uwinnipeg email, as well as the departmental assistant and Chair/Dean so that class cancellation forms can be posted outside classrooms.
2. Your uwinnipeg email address will normally be used for course related correspondence.
3. Please note that withdrawing before the VW date does not result in a fee refund.
4. Class make-up days are scheduled at the end of term for courses that conflict with holidays.

#### **Course Objectives**

This course discusses methods used in practical machine learning. Emphasis is placed on the foundations of well-known machine learning algorithms. Uncovering patterns in web content, structure and usage will also be discussed. Applications of these algorithms are also explored via the Weka machine learning workbench. Evaluating predictive quality of the algorithms and assessing credibility of learned patterns with statistical methods will be also covered.

## **Course Topics**

- Tree-based Classifiers
- Association rules and Market-basket Analysis
- Bayesian Classifiers
- Rule-Based Classifiers
- Numeric prediction (linear regression, regression trees, model trees)
- Cluster Analysis
- Neural networks
- Web Mining Methods

## **Evaluation Criteria**

Quizzes (3) -17 % each	48%
Project Proposal Report	4%
Final Project Report	40%
Final Project Presentation	8%

## **Final Letter Grade Assignment**

Historically, numerical percentages have been converted to letter grades using the following scale. However, instructors can deviate from these values based on pedagogical nuances of a particular class, and final grades are subject to approval by the Department Review Committee.

A+	90+ - 100%	B	70 - 74%	F	below 50%
A	85 - 90%	C+	65 - 69%		
A-	80 - 84%	C	60 - 64%		
B+	75 - 79%	D	50 - 59%		

Course Project will involve:

- Preparing and presenting a project proposal (max. 5 pages) approved by the instructors
- Reading a few papers related to the proposal topic
- Implementing a solution
- Preparing a project report (max 20 pages)
- Survey paper or in-depth discussion of a classical paper is an option

The Final Project will be evaluated on the basis of i) technical soundness and completeness ii) readability of the technical report iii) presentation

NO LATE WORK will be accepted. Class work must be typed and submitted in an 8.5x11 folder with your name and course number on the outside.

Quizzes will test both factual knowledge and the ability to apply course material to real life situations and problems. Answers must be meaningful to achieve potential credit. English dictionary aids will be allowed as appropriate.

*Please contact us as soon as possible* if extenuating circumstances require you to miss a class, deadline, quizzes/tests/examination. Should illness prevent participation in a test or examination, a medical certificate from a certified physician must be supplied before any adjustments are considered.

*Keep a copy of all class work* (e.g., assignment, quiz) handed back in case there is an error in recording of marks by the instructor.

### **Exam/Test Requirements**

- A Photo Id ***IS NOT*** required for taking a test or an exam.
- Cell phones are not permitted in the classroom.

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., access to volunteer note-takers) are encouraged to contact Accessibility Services (AS) at 786-9771 or email [accessibilityservices@uwinnipeg.ca](mailto:accessibilityservices@uwinnipeg.ca) to discuss appropriate options. Specific information about AS is available on-line at <http://www.uwinnipeg.ca/accessibility>. All information about a student's disability or medical condition remains confidential.

Students facing a charge of academic or non-academic misconduct may choose to contact the University of Winnipeg Students' Association (UWSA) where a student advocate will be available to answer any questions about the process, help with building a case, and ensuring students have access to support. For more information or to schedule an appointment, visit our website at [www.theuwsa.ca/academic-advocacy](http://www.theuwsa.ca/academic-advocacy) or call 204-786-9780.

We ask that you please be respectful of the needs of classmates and instructors/professors by avoiding the use of unnecessary scented products while attending lectures. Exposure to scented products can trigger serious health reactions in persons with asthma, allergies, migraines or chemical sensitivities. Please consider using unscented necessary products and avoiding unnecessary products that are scented (e.g. perfume).

### **Required Text Book(s)/Reading List\***

- WEKA Book (freely downloadable)
- Hal Daume, III A course in machine learning (freely downloadable)
- Z.Markov and D.T. Larose, Data Mining the Web, Wiley 2007 (notes will be provided)
- Course notes

**Prerequisite Information** (This information can be found in the UW Graduate calendar)

**Consent of the Department Graduate Program Committee Chair or Instructor.**

### **Misuse of Computer Facilities, Plagiarism, and Cheating**

Academic dishonesty is a very serious offense and will be dealt in accordance with the University's policies. Be sure that you have read and understood **Student Discipline #9** in the 2016-2017 Graduate UW Course Calendar.