THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE DEPARTMENT

GACS-7202/3 – Granular Computing: Foundations and Applications

Instructor Information
Instructor: Dr. Sheela Ramanna   **Office:** 3D15
E-mail: s.ramanna@uwinnipeg.ca   **Office Hours**: Tuesday 2:15 - 3:15pm
Class Meeting Time: T, Th 11:30- 12:45   **Room No:** 3D04
Course Web page: http://www.acs.uwinnipeg.ca/7202

Important Dates

1.   Final Withdrawal Date w/o academic penalty: March 15
 (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)
2.   Reading Week Break: Feb 17 -23
3.   Quiz 1: January 31
4.   Quiz 2: February 28
5.   Quiz 3: March 28
6.   Last Day of Class: April 4
7.   Final Project Presentation: April 9

The University is closed for holidays: February 18 (Louis Riel Day), April 19 (Good Friday).

Course Objectives
This course examines granular computing as a framework of theories, methodologies, techniques, and tools that make use of information granules in the process of problem solving. Machine Learning fundamentals are discussed. Granular computing has a significant impact on the design and implementation of intelligent systems. Emphasis is placed on the study of the theory of rough sets, near sets, fuzzy sets and combinations of these theories. Applications of these theories are also explored. Topics include:

- Machine Learning Foundations
- Classical Machine Learning Algorithms
- Granular Computing with Rough Sets: Pawlak Model
- Reducts and Rules
- Tolerance Rough Sets
- Granular Computing with Near Sets and Tolerance Near Sets

- ➢ Granular Computing with Fuzzy Sets
- ➢ Hybrid Method: Fuzzy Rough Sets
- ➢ The following tools/languages will be explored: WEKA, RSES, R
- ➢ Applications of Granular Computing include: Web Mining, Social Networks, Audio Signal Classification, Image Analysis

Evaluation Criteria

Quizzes (3) -25 % each	75%
Final Project	22%
Final Project Presentation	3%

Final Project will involve:
- ➢ Preparing a project proposal (max. 5 pages)
- ➢ Reading a few papers related to the proposal topic
- ➢ Implementing a solution
- ➢ Preparing a project report (max 20 pages)
- ➢ Survey paper is an option

The Final Project will be evaluated on the basis of i) technical soundness and completeness ii) readability of the 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., assignments, quiz) handed back in case there is an error in recording of marks by the instructor.

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%		

Exam 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., note-takers) are encouraged to contact Accessibility Services (AS) at 786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential http://www.uwinnipeg.ca/accessibility .

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work examinations without penalty. A list of religious holidays can be found in the 2018-19 Undergraduate Academic Calendar.

All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at www.uwinnipeg.ca/respect .

Required Text Book(s)/Reading List*

- WEKA Book (freely downloadable)
- Hal Daume, III A course in machine learning (freely downloadable)
- Class Notes and Research Papers

Prerequisite Information 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 with in accordance with the

University's policies. Be sure that you have read and understood Regulations & Policies #8, in the 2018-2019 UW Undergraduate Academic Calendar available at http://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf.

Additional information is available at University of Winnipeg library video tutorial "Avoiding Plagiarism" https://www.youtube.com/watch?v=UvFdxRU9a8g

Avoiding Academic Misconduct. Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves "aiding and abetting" plagiarism. Students who do this can be charged with Academic Misconduct.

Avoiding Copyright Violation. Course materials are owned by the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the instructor /presenter before photographing or recording slides, presentations, lectures, and notes on the board.

<u>Additional Course Related Information</u>

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.