COURSE OUTLINE
FALL 2024

	Date	Initials
Prepared by Instructor	August 20th, 2204	RMS
Approved by Head		

1. Calendar Information

Course Number: ENEL 645
Course description

Types of data mining: classification, clustering, association, prediction. Processes: data preparation, model building. Techniques: decision tree, neural network, evolutionary computing, Bayesian network. Applications: multi-media, text and web mining.

Course Hours: 3 units; H(3-0)
Academic Credit: 3
Calendar Reference: http://www.ucalgary.ca/pubs/calendar/current/engineering.html#10159

2. Learning Outcomes

At the end of this course, you will be able to:

1 Design and develop data mining and machine learning solutions for relevant problems

2 Select appropriate experimetal setups and metrics for evaluating machine learning models

3 Select appropriate machine learning models for different types of problems

4 Have a comprehensive overview of current trends in machine learning

5 Acquire hands-on experience with machine learning programming frameworks (e.g., Scikit-learn and TensorFlow)

3. Timetable

Section	Day(s) of the Week	Time	Location
F2024	TuTh	8 - 9:15 am	ST 126

4. Course Instructors

Course Coordinator

Section	First Name	Family Name	Phone	Office	Email
F2024	Roberto	Souza	587 899 2703	ICT 352C	roberto.souza2@ucalgary.ca

Other Instructors

Section	First Name	Family Name	Phone	Office	Email

Teaching Assistants

Section	First Name	Family Name	Phone	Office	Email

5. Assessments

* Class Participation - 5% (during class time): Students are expected to actively participate and engage in class.
* Midterm (15 October 2024) - 30%: Multiple choice midterm exam during class.
* Midterm (22 October 2024) - 30%: Multiple choice midterm exam during class.
* Assignment 01 (01 October 2024) - 10%: Proposal of a garbage classification system based on images and text.
* Assignment 02 (05 November 2024) - 10%: Implement a garbage classification system based on images and text.
* Final Project - 45% (30 November 2024): Final project report followed by a scheduled presentation. Students can solve a significant data mining and machine learning problem as a final project. The students are encouraged to develop projects related to their research but are free to select other topics of interest. The students are required to apply the methods discussed in class to develop their projects. The evaluation will be based on an oral presentation and a written report, formatted using the template of a relevant conference in the field of the project. The presentations and reports should include:
• Motivation and significance of the problem being solved.
• Include relevant references (well cited, high impact factor journals, etc.).
• Describe and discuss the methodology employed to solve the problem.
• Present and discuss the results.
• Outline potential future work.

Accommodation: students who miss an assessment date/deadline should contact the instructor within 48 hours of the assessment date/deadline and provide proper documentation to request an accommodation, which will be an appropriate extension for the delivery date of assignments or the final project.
To accommodate students that potentially missed one of the midterms, only the highest grade across both midterms will be considered. For students who missed both midterms, given they provide proper documentation, an extra exam will be scheduled for them.

For reappraisals of term work or final assessments, please refer to the SSE Reappraisal of Graded Term Work and Academic Assessments Policy (https://schulich.ucalgary.ca/sites/default/files/teams/1/SSE%20Reappraisal%20Policy.pdf) and forms are available on the Engineering Student Center D2L site.

6. Use of Calculators in Examinations

You may use any calculator you wish for studying and completing lab reports. However, you must use only one of the following sanctioned Schulich School of Engineering calculators during exams: Casio FX-260S, Casio FX-300MS, Casio FX-95ES Plus, Casio FX-300ESPLUS2 (2nd Edition), TI-30XIIS, TI-30Xa, Sharp EL-531XTB-WH, and HP10S Plus.

7. Final Grade Determination

The final grade in this course will be based on the following components:

Component	Learning Outcome(s) Evaluated	Weight
Assignments	1,2,3,4,5	20%
Midterm	1, 2, 3, 4	30%
Class Participation	1,2,3,4	5%
Final project	1,2,3,4,5	45%
	Total:	100%

Conversion from a score out of 100 to a letter grade will be done using the conversion chart shown below. This grading scale can only be changed during the term if the grades will not be lowered.

Letter Grade	Total Mark (T)		
A+		T ≥	95.0%
A	90.0%	≤ T <	95.0%
A-	85.0%	≤ T <	90.0%
B+	80.0%	≤ T <	85.0%
B	75.0%	≤ T <	80.0%
B-	70.0%	≤ T <	75.0%
C+	65.0%	≤ T <	70.0%
C	60.0%	≤ T <	65.0%
C-	55.0%	≤ T <	60.0%
D+	50.0%	≤ T <	55.0%
D	45.0%	≤ T <	50.0%
F		T <	45.0%

8. Textbook

The following textbook(s) is required for this course:

Title	N/A
Author(s)	
Edition, Year	
Publisher	

The following textbook(s) is recommended for this course:

Title	Deep Learning
Author(s)	Ian Goodfellow, Yoshua Bengio, Aaron Courville
Edition, Year	1st, 2016
Publisher	The MIT Press

9. University of Calgary Policies and Supports

SSE ADVISING AND POLICIES

All Schulich School of Engineering students have access to a D2L site titled “Engineering Student Centre”. Students have a responsibility to familiarize themselves with the policies available on this site.

ACADEMIC MISCONDUCT

Academic Misconduct refers to student behavior which compromises proper assessment of a student’s academic activities and includes: cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor’s expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

For more information on the University of Calgary Student Academic Misconduct Policy and Procedure and the SSE Academic Misconduct Operating Standard, please visit: https://schulich.ucalgary.ca/current-students/undergraduate/student-resources/policies-and-procedures

Additional information is available on the Academic Integrity Website at https://ucalgary.ca/student-services/student-success/learning/academic-integrity

ACADEMIC ACCOMODATION

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The Student Accommodations policy is available at https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf

Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the Procedure for Accommodations for Students with Disabilities (https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf). SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a degree based on a Protected Ground other than Disability, should communicate this need by submitting a SSE Request for Academic Accommodation Form (ESC D2L - Forms) to the Associate Head (Undergraduate Studies) within 10 business days prior to the class, test, exam, or assignment at issue.

INSTRUCTOR INTELLECTUAL PROPERTY

Course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary.

COPYRIGHT LEGISLATION

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Acceptable-Use-of-Material-Protected-by-Copyright-Policy.pdf) and requirements of the copyright act (https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Non-Academic-Misconduct-Policy.pdf.

MEDIA RECORDING (if applicable)

Please refer to the following statement on media recording of students: https://elearn.ucalgary.ca/wp-content/uploads/2020/05/Media-Recording-in-Learning-Environments-OSP_FINAL.pdf

**Media recording for lesson capture*

The instructor may use media recordings to capture the delivery of a lecture. These recordings are intended to be used for lecture capture only and will not be used for any other purpose. Although the recording device will be fixed on the Instructor, in the event that incidental student participation is recorded, the instructor will ensure that any identifiable content (video or audio) is masked, or will seek consent to include the identifiable student content to making the content available on University approved platforms.

**Media recording for self-assessment of teaching practices*

The instructor may use media recordings as a tool for self-assessment of their teaching practices. Although the recording device will be fixed on the instructor, it is possible that student participation in the course may be inadvertently captured. These recordings will be used for instructor self-assessment only and will not be used for any other purpose.

**Media recording for the assessment of student learning*

The instructor may use media recordings as part of the assessment of students. This may include but is not limited to classroom discussions, presentations, clinical practice, or skills testing that occur during the course. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose.

SEXUAL VIOLENCE POLICY

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the policy available at https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Sexual-and-Gender-Based-Violence%20Policy.pdf

OTHER IMPORTANT INFORMATION

Please visit the Registrar's website at: https://www.ucalgary.ca/registrar/registration/course-outlines
for additional important information on the following:

- Wellness and Mental Health Resources
- Student Success
- Student Ombuds Office
- Student Union (SU) Information
- Graduate Students' Association (GSA) Information
- Emergency Evacuation/Assembly Points
- Safewalk

10. Additional Course Information

Course Format and Scheduling

The course will be delivered through lectures that will have hands-on components. Students are expected to bring their laptops to class.

Assignments

- 01 October 2024 (midnight) - Deadline for delivering the 1st assignment in a D2L dropbox
- 05 November 2024 (midnight) - Deadline for delivering the 2nd assignment in a D2L dropbox

Midterm

- 15 October 2024 - in class during class time
- 22 October 2024 - in class during class time
- 30 November 2024 - Deadline for delivering final project report
- Final project presentation will be on 03 and 05 December during class time

Guidelines for Completing and Submitting Coursework

The midterm will be multiple-choice
Assignments will be delivered using D2L dropboxes
Templates for the final project report will be given
Rubrics for each marked component will be provided

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