DALHOUSIE UNIVERSITY
Faculty of Computer Science

CSCI 4144: Operating Systems
Course Syllabus

Instructor Information

Instructor:	Qiang Ye	**E-mail:**	qye@cs.dal.ca
Class Time:	W/F 10:05am-11:25am	**Office Hours:**	W 11:30am-12:30pm
Delivery Platform:	MS Teams	**Course Homepage:**	dal.brightspace.com
Course Mail List:	all-cs4144@cs.dal.ca		
Course TA:	TBA		

Important Dates

- Last day to drop fall term courses with no financial implications: Jan. 14
- Last day to drop fall term courses without a "W": Jan. 28
- Winter Study Break: Feb. 21 - 25
- Midterm Exam: Feb. 18
- Final Exam: TBA in the period of Apr. 8 -26

Course Description

This course reviews main concepts in data mining and data warehouses including objectives, architectures, algorithms, implementations, and applications. The topics covered include operational information process, decision-oriented information process, data warehousing and On-Line Analytical Process (OLAP), characterization mining, association rule mining, classification and predication and clustering. Selected system tools for data mining and data warehousing are introduced.

Learning Outcomes

- Understand how to clean raw data
- Understand how to integrate data from different sources
- Understand how to effectively reduce the amount of raw data
- Understand how to how to transform/discretize data
- Describe the components of a data warehouse
- Design software to complete On-Line Analytical Process (OLAP) operations
- Design software to mine association rules
- Compare different association rule mining algorithms
- Design software to perform classification/prediction operations
- Compare different classification/prediction algorithms
- Design software to perform clustering operations
- Compare different clustering algorithms

Course Rationale

Data mining is the process of discovering interesting patterns and knowledge from a large amount of data. If the data comes from one source, data mining is relatively easier. If the data involves multiple sources, it is better to use a data warehouse to organize the data. Technically, a data warehouse is a repository of information collected from multiple sources, stored under a unified schema, and usually residing at a single site. In this course, we will first learn how to use a data warehouse to organize data

and perform On-Line Analytical Process (OLAP) operations. Afterwards, we will learn a series of data mining techniques.

Class Format and Course Communication

- Live classes will be delivered via MS Teams. Recordings will be made available afterwards.
- Course material will be posted through the course's brightspace site.
- Course announcements and deadlines will be posted to the course mail list, which comprises the instructor's and students' Dal emails, as well as through the course's brightspace site. It is the student's responsibility to check their Dal e-mail and brightspace account on a daily basis. To access your Dal email, please refer to: https://www.dal.ca/dept/its.html

Evaluation Criteria

- Assignments (30%)
  - Four assignments
  - Late Submission: Assignments submitted within 24 hours of the deadline will lose 10% of the original mark. After the 24-hour time window, no assignment will be accepted.
- Project (20%)
  - Allowed to work in a team with up to 3 students.
  - Late Submission: Project components submitted within 24 hours of the deadline will lose 10% of the original mark. After the 24-hour time window, no submission will be accepted.
- Midterm Exam (20%)
  - Individual open book: It is open book, but you need to complete the exam by yourself.
  - To be held during class on February 18, 2022.
- Final Exam (30%)
  - Individual open book: It is open book, but you need to complete the exam by yourself.
  - The exam will be scheduled by the university.

Notes

- A minimum grade of C is required in this course if it is core to your FCS degree, or if it will be used as a prerequisite for a subsequent CSCI course.
- As of 2019, students who receive a grade lower than C in the same required CS course twice, will be dismissed.
- The grade conversion scale in Section 17.1 of the Academic Regulations, Undergraduate Calendar will be used.
- **It is up to the discretion of the instructor to use remote proctoring in online testing. Students may be required to download proctoring software onto their devices. Students who cannot meet system requirements for remote proctoring should contact the instructor for an alternate assessment. (Typical system requirements are: (i) Mac OS or Windows, (ii) a web-cam, and (iii) an internet connection.)**

Student Declaration of Absence

The Student Declaration of Absence policy shall apply. Namely, if you experience a short-term absence that is no longer than three consecutive days, you must:
- Notify your instructor by email <u>prior to the academic deadline or scheduled time</u>. In the email, <u>you need to state what your problem is</u>. Being busy is not a valid reason for extension requests.
- Download and complete the Student Declaration Form
- Send the completed form to the instructor by email within three days following your last day of absence

The details about the form can be found here:

Please note you can only submit a maximum of two separate Student Declaration of Absence forms per course during a term.

Midterm and Final Exam Requirements
- Photo ID is required

Academic Standards

Failure to properly attribute sources in your work will be treated as an academic standards issue and points may be deducted for not following citation requirements. For example, forgetting to quote text taken from other sources, failure to include in-text citations, or a failure to include required infor-mation in the citations or references. Please see the resources on proper citation provided by the Dal-housie Writing Center (https://dal.ca.libguides.com/c.php?g=257176&p=5001261).

Please note that if it appears that the error was made with intent to claim other people's work as your own such as a lack of both citations and references, an allegation of plagiarism will be submitted to the Faculty Academic Integrity Officer, which could result in consequences such as a course failure.

Required Texts and Resources
- The text for the course is: "Data Mining: Concepts and Techniques", 3rd edition, Jiawei Han, Mich-eline Kamber and Jian Pei, Morgan Kaufmann Publishers, July 2011, ISBN 978-0123814791. Note that the electronic version of the book is available via the "Science Direct" section of Dal Library: http://dal.ca.libguides.com/c.php?g=257110&p=1716818
- The lecture slides will be posted on the learning management system (i.e. brightspace).

Web Resources
- General Data Mining Site: http://www.kdnuggets.com
  - A collection of DM publications, software/tools, data repositories, companies, etc.
- Data Mining Software - Weka: http://www.cs.waikato.ac.nz/ml/weka/
  - A collection of machine learning algorithms for solving real-world data mining problems. It is written in Java and runs on almost any platform.
- Data Repository #1: http://www.ics.uci.edu/~mlearn/MLRepository.html
- Data Repository #2: https://www.kaggle.com/datasets
- Data Repository #3: http://www.kdnuggets.com/datasets/index.html
- Wikipedia: http://en.wikipedia.org/wiki/Data_mining

Prerequisites
CSCI 2110.03 and CSCI 2141.03

Tentative List of Topics
- Overview of Data Mining and Data Warehousing
- Data Pre-processing
- Data Warehousing and OLAP
- Association Rule Mining
- Classification
- Cluster Analysis
- Advanced Topics

Responsible Computing Policy

Usage of all computing resources in the Faculty of Computer Science must be within the Dalhousie Acceptable Use Policies (http://its.dal.ca/policies/) and the Faculty of Computer Science Responsible Computing Policy. For more information please see https://www.cs.dal.ca/downloads/fcs_policy_local.pdf

Use of Plagiarism Detection Software

All submitted code may be passed through a plagiarism detection software, such as the plagiarism detector embedded in Codio, the Moss (https://theory.stanford.edu/~aiken/ moss/) Software Similarity Detection System, or similar systems. If a student does not wish to have their assignments passed through plagiarism detection software, they should contact the instructor for an alternative. Please note, that code not passed through plagiarism detection software will necessarily receive closer scrutiny. https://cdn.dal.ca/content/dam/dalhousie/__pdf/dept/university_secretariat/policy-repository/OriginalitySoftwarePolicy.pdf

Culture of Respect[1]

Every person has a right to respect and safety. We believe inclusiveness is fundamental to education and learning. Misogyny and other disrespectful behaviour in our classrooms, on our campus, on social media, and in our community is unacceptable. As a community, we must stand for equality and hold ourselves to a higher standard.

What we all need to do:
1. **Be Ready to Act:** This starts with promising yourself to speak up to help prevent it from happening again. Whatever it takes, summon your courage to address the issue. Try to approach the issue with open-ended questions like "Why did you say that?" or "How did you develop that belief?"
2. **Identify the Behaviour:** Use reflective listening and avoid labeling, name-calling, or assigning blame to the person. Focus the conversation on the behaviour, not on the person. For example, "The comment you just made sounded racist, is that what you intended?" is a better approach than "You're a racist if you make comments like that."
3. A**ppeal to Principles:** This can work well if the person is known to you, like a friend, sibling, or co-worker. For example, "I have always thought of you as a fair-minded person, so it shocks me when I hear you say something like that."
4. **Set Limits:** You cannot control another person's actions, but you can control what happens in your space. Do not be afraid to ask someone "Please do not tell racist jokes in my presence anymore" or state "This classroom is not a place where I allow homophobia to occur." After you have set that expectation, make sure you consistently maintain it.
5. **Find or be an Ally:** Seek out like-minded people that support your views, and help support others in their challenges. Leading by example can be a powerful way to inspire others to do the same.
6. **Be Vigilant:** Change can happen slowly, but do not let this deter you. Stay prepared, keep speaking up, and do not let yourself be silenced.

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[1] Source: Speak Up! © 2005 Southern Poverty Law Center. First Printing. This publication was produced by Teaching Tolerance, a project of the Southern Poverty Law Center. Full "Speak Up" document found at: http://www.dal.ca/dept/dalrespect.html. Revised by Susan Holmes from a document provided April 2015 by Lyndsay Anderson, Manager, Student Dispute Resolution, Dalhousie University, 902.494.4140, lyndsay.anderson@dal.ca www.dal.ca/think.

University Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and the Senate. https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=111&loaduseredits=False

Territorial Acknowledgement

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." https://www.dal.ca/about-dal/internationalization.html

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. (read more: http://www.dal.ca/dept/university_secretariat/academic-integrity.html)

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion please contact: https://www.dal.ca/campus_life/academic-support/accessibility.html for all courses offered by Dalhousie with the exception of Truro.

Conduct in the Classroom — Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

Diversity and Inclusion — Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). (read more: http://www.dal.ca/cultureofrespect.html)

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative jus- tice process. If an informal resolution can't be reached, or would be

inappropriate, procedures exist for formal dispute resolution. (read more: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-con.html)

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. (read more: https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html)

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work, and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. (read more: https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assigments-and-use-of-originality.html)

Student Use of Course Materials

These course materials are designed for use as part of the CSCI courses at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading material to a commercial third party website) may lead to a violation of Copyright law.

Learning and Support Resources

Please see https://www.dal.ca/campus_life/academic-support.html