UBC Department of Computer Science
CPSC 304: Introduction to Relational Databases (January to April 2023)

Course Description

Overview of database systems, ER models, logical database design and normalization, formal relational query languages, SQL, data warehouses and data mining.

Prerequisites

CPSC 221 or an equivalent, approved course in data structures and discrete mathematics from a previous institution.

Please note that the CPSC department enforces prerequisites. Students without appropriate prerequisites will get a "missing prerequisite" letter near the start of the course. Watch for it in your e-mail if you fall into this category and follow the instructions in the letter to resolve it. If you do not have the prerequisites, you will be dropped from the course.

Basic Information

Lectures

Section 201: Monday/Wednesday 3:30PM to 5:00PM (Pacific) in SWING 121
Section 202: Tuesday/Thursday 5:00PM to 6:30PM (Pacific) in CIRS 1250

The Head of the Computer Science department has determined that this course will provide an in-person and not a hybrid, online, or multi-access mode of instruction.

Office Hours

Online using Zoom or in person, location TBD. The times will be announced shortly after the start of the term, and will also be listed on Canvas. All times are in the Vancouver (Pacific) time zone. Tutorials will start the week of January 30th.

Tutorials (sometimes referred to as "Labs")

The TAs will conduct tutorials in person. Assuming you have checked with the TAs and it is okay with them, you may attend any tutorial slot. If there are many questions/requests for help directed at the TAs, those who are registered for the tutorial have priority.

The tutorials will be a hybrid of office hours plus a short lesson or a set of instructions. Sometimes your weekly "tutorial" is more along the lines of a traditional tutorial; and at other times, it is more along the lines of a lab. It may also provide a chance for you to ask questions like you would in an office hour. You may need to do some pre-reading or preparation for your tutorial because we probably won't be able to cover all the contents in class; and even if we come close, your tutorial might be scheduled in advance of the corresponding lecture. Be sure to do the tutorial, in order to prepare for your exams. We anticipate that the exams will line up with material that you will have learned in your tutorials.

Be sure to register for one 50-minute tutorial section.

Communication

E-mail and E-mail Addresses: Because this is a very large class, it is simply not practical for the instructor or the TAs to respond to individual e-mail requests (or private postings) of a general nature. Limit such e-mail to items having a personal or confidential nature (e.g., prolonged illness). Lectures, tutorials, office hours, and Piazza are suitable places to ask general questions. You can find the teaching team's contact information on Canvas.

Piazza Communication on Exam Days: Questions posted on the day of an exam might not be answered as the course staff will be busy preparing for the exam.

Covid Safety

For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. Non-medical masks that cover our noses and mouths are a primary tool to make it harder for Covid-19 to find a new host. We expect and prefer that students wear a non-medical mask during our class meetings, for your own protection, and the safety and comfort of everyone else in the class. If you have not yet had a chance to get vaccinated against Covid-19, vaccines are available to you, free: http://www.vch.ca/covid-19/covid-19-vaccine#clinics. The higher the rate of vaccination in our community overall, the lower the chance of spreading this virus. You are an important part of the UBC community. Please arrange to get vaccinated if you have not already done so.

If you're sick, it's important that you stay home – no matter what you think you may be sick with (e.g., cold, flu, other). If you think you might have Covid symptoms and/or have tested positive for Covid and/or are required to quarantine: You can do a self-assessment for Covid symptoms here: https://bc.thrive.health/covid19/en
Do not come to class if you are sick, have Covid symptoms, have recently tested positive for Covid, or are required to quarantine. This precaution will help reduce risk and keep everyone safer. In this class, the marking scheme is intended to provide flexibility so that you can prioritize your health and still be able to succeed as outlined throughout, including planning to stream all classes and put all recordings on Canvas.

If you are sick on a midterm exam day, the weight of the midterm will be moved to the final exam.

If you are sick on a final exam day, do not attend the exam. You must apply for deferred standing (an academic concession) through Science Advising no later than 48 hours after the missed final exam/assignment. Students who are granted deferred standing write the final exam/assignment at a later date. Learn more and find the application online: https://science.ubc.ca/students/advising/concession

If I (the instructor) am sick: I will do my best to stay well, but if I am ill, develop Covid symptoms, test positive for Covid, or am a close contact of someone who has Covid, then I will not come to class. If that happens and I am well enough to teach, then I will teach via Zoom. If not, then class will be cancelled. In either case, I will inform you via Piazza as soon as possible.

Textbooks/Clickers

Required Textbook

Ramakrishnan and Gehrke. Database Management Systems, 3rd Edition, McGraw-Hill, 2003.

Depending on the COVID-19 situation, copies of the physical textbook are on reserve for CPSC 304 and 404 at the library and at the CS Reading Room. All students can use the Reading Room. Check the website for their hours and their book availability during COVID-19: https://www.cs.ubc.ca/our-department/facilities/reading-room/course-reserves

Additional Reference Material (optional)

If you want additional reference material, then any book on database systems that has been published in the past 20 years should be fine, providing it deals with relational database systems and the topics described on this outline. However, please note that ER notation varies across different systems and textbooks, and you are responsible for using the notation that is taught in class. One such book is the following:

- Garcia-Molina, Hector; Ullman, Jeffrey D.; and Widom, Jennifer. *Database Systems: The Complete Book*, Prentice-Hall, 2009.

zyBooks (Online book with exercises, OPTIONAL)

Finally, a really good online resource and practice tool is the zyBooks interactive course called *Database Systems with SQL* which we reviewed in Summer 2020. Although they use a different entity-relationship diagram notation than we do, and they omit the topics of Relational Algebra, Datalog, functional dependencies, data mining, and some of our content on data warehousing, they do a very good job covering database concepts, database design, SQL, and MySQL (including programming). They have lots of online, interactive practice questions and examples that you may be interested in, including SQL. They also have a very nice introduction to NoSQL, Big Data, MySQL, and MySQL programming interfaces—and these may be helpful with your project or your co-op term. The cost for this online book/course is $39, and you can get some good practice with it. It's worth checking out, but it is **optional**. Here are the details:

1. Sign in or create an account at learn.zybooks.com
2. Enter zyBook code: UBCCPSCFall2022
3. Subscribe

Required Clicker

We will use **iClicker Cloud** (also known as iClicker REEF). It allows you to respond to clicker questions with either a mobile device or a computer. It is free. Here are the instructions for students:

https://lthub.ubc.ca/guides/iclicker-cloud-student-guide/

When you register for iClicker Cloud, and you connect your registration to Canvas, then Canvas will automatically pick up your scores.

Electronic Information Sources

Canvas

Canvas is UBC's standard Learning Management System. We will use Canvas to host most of the online materials, including lectures and quizzes, for this course. This is also where your grades will be posted. Canvas allows us to post lecture slides, pre-recorded lectures, recorded lectures, handouts, practice exercises, solutions, grades, group memberships, tutorials, project submissions, etc. for this course.

Please download the current slides, and view the short recordings (if any) that your instructor has made for the next lecture, before coming to class. Please be advised that you are responsible for all material presented in the lectures, and in the appropriate parts of the textbook, assignments, and tutorials. We intend to run the lectures with a mix of interactivity: clicker questions and in-class exercises. We also want you to be prepared for class by viewing selected screencasts beforehand.

UBC's IT Services group is hosting Canvas. If you don't already have a Campus-Wide Login (CWL) account, you should visit https://it.ubc.ca/services/accounts-passwords/campus-wide-login-cwl to get one. All registered students for CPSC 304 who have a CWL ID will automatically have their CWL ID linked to the CPSC 304 Canvas pages by the time the course starts. If you are taking other courses that use Canvas, then your CWL ID will be linked to those courses, too.

Piazza

Piazza will host our course discussion board (also called a "bulletin board"), and it is ***required reading*** for this course. You should read it at least once per day. Prior to the add/drop deadline, we will post slides and links to the recorded lectures for students who are on the waitlist. After the deadline, we will not be posting slides or exams or solutions there. We will limit Piazza to a discussion board.

Questions about the CPSC 304 course content (e.g., lecture, textbook, assignments, Web pages) can be posted on the Piazza discussion board, *but please check to make sure that your question hasn't already been asked or answered*. In previous terms, students have asked the same

questions over and over. Remember, you can always re-read Piazza notes that you've already seen, and you can search for keywords within Piazza.

The TAs and instructors will be monitoring and responding to questions daily, but students are also encouraged to respond to each other's postings and questions. Answering questions is a good way test your understanding of the material. *Do not post code or solutions* on the bulletin board (other than perhaps small fragments, if necessary). Problems with Canvas itself (i.e., other than with the content of the CPSC 304 web pages) should be directed to help@itservices.ubc.ca. Problems with undergrad accounts, servers, or hardware problems in the lab should be directed to help@ugrad.cs.ubc.ca.

If you encounter any technical problems with Piazza, or if you have feedback for the Piazza developers, you can e-mail them at team@piazza.com.

Piazza registration instructions are found on Canvas – click on the Piazza link in the sidebar. There is no access code but you may find that Piazza will ask you to associate your existing account with a UBC affiliated email. Use the instructions at https://support.piazza.com/support/solutions/articles/48000616666-student-add-an-email-address-or-merge-two-accounts to add a UBC affiliated email to your account.

You have a few options when it comes to a UBC affiliated email. Regardless of which option you choose, please make sure to **activate the email address before you register it with Piazza**:

1. Run getacct to get access to CWLusername@students.cs.ubc.ca or csID@ugrad.cs.ubc.ca email. Be sure to put in a valid email address (as in an email address that you actually check) for email forwarding or else you will not be able to receive any emails sent to you from Piazza.

   Note the @ugrad.cs.ubc.ca email alias corresponding with your account. This anonymized address may be used to identify you on services potentially located outside of Canada. If you choose not to keep your alias confidential, please note that UBC will proceed on the assumption that you do not object to said services potentially identifying you personally, and that you are consenting to the storage of personal information on servers outside Canada."

2. You can also use your CWLusername@student.ubc.ca email address **if you have already activated this email** by following the instructions at https://it.ubc.ca/services/email-voice-internet/ubc-student-email-service.

Oracle

We will use Oracle as our default DBMS. It is hosted by the Department of Computer Science. Oracle's command line interface for entering and executing SQL statements is called SQL*Plus. A popular programming environment that allows embedded SQL is Java/JDBC. However, you are free to use MySQL and PHP for your programming project. Some tutorial notes are

available for all these products. Actually, you can use any relational DBMS and programming language that you wish, providing your group members agree; but please note that we can't support everything, so, your team is on its own for support for most alternative products. Some of the TAs might be familiar with other DBMSs, but don't count on it.

Tentative Topics

A list of the learning outcomes for each topic can be found here.

Topic-level learning goals are useful for self-evaluation and preparing for exams. The lecture slides will contain the topic-level learning goals. These are useful for self-evaluation and when studying for exams. They also give you (and future employers) a more detailed view of the course's contents than a typical calendar entry or a list of topics would.

Topic	Subtopics	Textbook Reference
Introduction	Database Objects, DBMS Models, Abstraction Levels, System Structure, DBA Tasks	Chapter 1
Database Design (Data Modeling)	Entity-Relationship Diagrams, Logical Database Design, Formal Structure of the Relational Model, SQL's Data Definition Language, Keys, Integrity Constraints including Referential Integrity	Chapters 2 & 3
Schema Refinement and Normalization	Functional Dependencies; Redundancies; 1NF, 2NF, 3NF, & BCNF Normal Forms; Decomposition, Lossless-Join, and Synthesis	Chapter 19
Formal Query Language	Relational Algebra	Chapter 4
Structured Query Language (SQL)	Basic Queries, SQL's Data Manipulation Language, Set Operations, Null Values, Ordering & Aggregation, Modification, Embedded vs. Dynamic SQL, Cursors, JDBC	Chapter 5 & 6
Query Languages (cont.)	Datalog	Chapter 24
Data Warehousing	Introduction to Data Warehousing and OLAP; the ETL Process; Star vs. Snowflake Schemas; Aggregation and Hierarchies; Data Cubes; Microsoft's SQL Server and SQL Server Analysis Services; View Selection and Materialization	Chapter 25
Data Mining	The KDD Process (Knowledge Discovery in Databases), Frequent Itemsets, Association Rules, and maybe Frequent Pattern Trees (FP-Trees)	Chapter 26

Evaluation

The final grades will ***tentatively*** be calculated as follows. We reserve the right to change this grading scheme in case some unforeseen events come up beyond the instructors' control. If we do make a change, we will certainly inform you.

Component	Weighting
Syllabus Quiz	1%
Clickers	2%
In-Class Exercises	4%
Project	
Milestone 0: Form a group	0%
Milestone 1: Project proposal and ER diagram	3%
Milestone 2: Definition of relations and SQL DDL; normalization complete; proposed queries in English submitted	6%
Milestone 3: Project check-in	2%
Milestone 4: Project is fully implemented	4%
Milestone 5: Project demo	8%
Milestone 6: Individual/peer evaluations	0%
Midterm 1 (February 17, 2023)	15%
Midterm 2 (March 22, 2023)	15%
Final Exam (Date to be announced!)	40%

Minimum Passing Criteria

To pass the course, you must pass the final exam **and** achieve an overall grade of 50% or better. If you fail the final exam, you will receive as your course grade the lower of the normally computed grade and 45%.

Clickers

Clicker marks will be for participation points only. To receive full credit, you must participate in at least 80% of the exercises over the term. Note that the goal of this policy is to cover cases where you are absent or experience technical issues, so there are no "excused absences" from the clicker questions.

We will only consider clicker marks earned in your registered section. That is, if you participate in the clicker questions for another section, that participation will not be eligible for consideration when your final clicker score is calculated.

In-Class Exercises

The in-class exercises will be assigned during the scheduled class times. Again, we'll take the best 80% of the days to allow for the odd missed class. The in-class exercises will be marked on a 0/1/2 point scale for effort and completion—not necessarily for the correct answers. These will be handed in, on Canvas, by 10PM the day after lecture. We will not accept late submissions for in-class exercises.

The two sections may have a different number of in-class exercises. You are responsible for completing the in-class exercises from your officially registered section.

Disclaimer: We might tweak the percentages for the in-class exercises depending on how many of each we do, and what kind of unexpected technical issues may occur.

Project

Detailed information about the project can be found on Canvas. Some milestones may require you to submit deliverables earlier than the stated deadline.

Project Milestones

Detailed information about the project can be found in the project description document on Canvas.

There are six project milestones. Certain milestones may require you to submit deliverables earlier than the stated due date. It is your responsibility to read through the milestone description well ahead of schedule to account for these types of requirements. Refer to Canvas for more details.

Milestone Submission Rules

Deliverables which are submitted via a commit to the course provided repository are still subject to late penalties. Your TAs will be checking the exact commit times and work that is submitted past the stated deadline will be subject to late penalties.

When we ask for deliverables x business days ahead of a deadline (where x is some positive non-zero integer), we mean the deliverables should be ready at the start of day when we count backwards from your deadline. For example, assume that we are working with a requirement where something is submitted two business days ahead of schedule. If your deadline is on a Tuesday at 3:30PM Pacific time, we expect that your deliverables are submitted via the avenue stated by the milestone description by 9AM Pacific time on Friday. This is to ensure that your TAs have sufficient time to go through your deliverables to discuss them with you. Your TAs are also students and it would be deeply unfair to them to give them work last minute.

Milestones 1, 2, 4, and 6:

- Will not be accepted 48 hours after the due date and time. A grade of 0 will be assigned.
- Will be subject to a 25% deduction per portion of a day (i.e. deduction applies whether the delay is 2 minutes late or 23 hours late).
    - The 25% deduction is calculated based on the full value of the project deliverable. For example, if a deliverable is worth 20 points and is handed in a day late, a 5 point deduction would be applied.

Milestone 3:

- The project check in meeting is mandatory. Please be careful to choose a time that will work for all group members. If a student misses the check in without documentation supporting the absence, we reserve the right to give a 0 for their milestone 3 grade and apply a penalty of 25% to their milestone 4.
    - The 25% deduction is calculated based on the full value of the project. For example, if a deliverable is worth 20 points and is handed in a day late, a 5 point deduction would be applied.
- Your project mentor is not responsible for ensuring that you have signed up for a meeting. Instructions on how to sign up for a meeting will be posted on Piazza and it is your responsibility to ensure that the group has signed up for a time.
- If you fail to show up to the project check in meeting or you cancel with less than 1 business day of notice (see above for what is considered one business day), you will be considered as choosing to forfeit the marks associated with milestone 3. You will receive a 0 for the milestone. If an unexpected emergency is the cause of your failure to attend, you will need to contact the course coordinator for approval to schedule a new meeting. The course coordinator may choose to ask for documentation.
- If you cancel your meeting, your project mentor is not responsible for ensuring that you will be able to meet with them sometime before the deadline for milestone 3 passes. Your TAs are all students and they are also very busy. It would be unfair to expect them to drop their other commitments for a last-minute meeting. They will, of course, try their best to accommodate but there is a chance that you will not be able to find another suitable time for your milestone 3 meeting and will thus, forfeit the marks associated with milestone 3.
- Deliverables that are submitted past the deadline stated in the deliverable description will be given a 25% penalty per portion of a day it is late.
- Deliverables will not be accepted after the check-in meeting has concluded.

Milestone 5:

- Students who are absent for the project demo will be given a 0 unless documentation supporting the absence is provided within one week of the demo date. Please be careful to choose a time that will work for all group members.
- If the provided documentation is accepted, the implementation portion of the project will be re-weighed to include the value of the project demo.

Examinations

There will be two midterms and a final examination. There are no alternate sittings for the midterm (refer to the "Covid Safety" section for what happens when you miss a midterm and/or final). Each exam will be open book and notes are allowed but calculators, electronic devices, and communication with others is **not** allowed. You are responsible for the material covered in lecture, in the course resources, and in the assigned reading – even if it has not been explicitly covered in lecture. If you have an unplanned absence (e.g., due to illness), you may provide either documentation or fill out a self-declaration form. However, note that for a second or subsequent request for academic concessions resulting from acute illness, we will refer you to your academic advising office, graduate supervisor, or graduate advisor. The final covers more topics than the midterms.

The final examination will be written on a date in April to be determined by the University. Please do not schedule any travel plans prior to the announcement of the final exam date; travel is not an accepted reason for the delay or deferment of a final exam. If you cannot write the final exam, then you must provide documentation (e.g., a doctor's note) to your home faculty office within 48 hours of missing the exam. For example, if you are in Science, then it will be the Faculty of Science; if you are in Engineering, then it will be the Faculty of Applied Science; and similarly for Arts, Commerce, etc. You will write an exam at a future date determined by the University; usually, this is during the summer term's final exam period in June 2021.

Important note: Your home faculty office may not allow you to write a deferred final exam (even if you have a doctor's note) if your term work is incomplete (e.g., missing midterm, missing classes or tutorials, or incomplete project).

Regrading

Unless a different deadline is explicitly given, regrade requests will be accepted up to one week after the grades are released. When a regrade request is submitted, we reserve the right to regrade the whole deliverable/exam – not just a portion of it. You can submit non-exam related regrade requests here; keep an eye on Piazza for instructions on how to submit a regrade request for an exam.

Things to keep in mind about regrade requests:

- A regrade request is **not** an opportunity for you to argue about the grading scheme. It is a chance for you to address situations where the grading scheme was applied incorrectly to your quiz. Regrade requests that debate the validity of the grading scheme (e.g., this item should not be worth this number of points or this item should not be included in the rubric) will be discarded without warning.

- The regraded mark is final– even when the regraded mark is less than the original grade. You cannot choose to withdraw a regrade request.

- If we receive multiple regrade requests for an assessment, we will only consider the very last request that was submitted.

- When submitting a regrade request, we will ask you for an explanation of why you feel the need to submit the request. We are not looking for an essay. We want to have a meaningful discussion with you about why particular elements of your answer deserve to be awarded points based on the grading scheme. Unless the grading error is very obvious, it is generally in your best interest to spend some time on answering this part of the regrade request.

- Regrade requests received with reasons that do not discuss the answer with relation to the grading scheme (e.g., "I tried really hard and this grade does not reflect my effort" or "I don't agree") may be discarded without warning.

- Late regrade requests are not accepted.

- Incomplete regrade requests will be discarded.

- We will only start processing regrade requests after submission deadline has passed.

- Regrade requests submitted via the incorrect avenue (e.g., through email) will not be considered.

Illness and late policy

Contact the course coordinator via email immediately when you know you will miss a graded assessment (e.g., exam/project).

No late projects will be accepted without a valid reason, such as illness. If you think you have a valid reason, please contact the instructor directly. Because you can earn 100% even if you miss some, we typically do not accept excuses for missed in-class exercises. (That said, if you have concerns, please talk to us!)

Collaboration/Cheating Policy

UBC's Policy on Academic Integrity:

> "Academic honesty is essential to the continued functioning of the University of British Columbia as an institution of higher learning and research. All UBC students are expected to behave as honest and responsible members of an academic community. Breach of

> those expectations or failure to follow the appropriate policies, principles, rules, and guidelines of the University with respect to academic honesty may result in disciplinary action."
> http://www.calendar.ubc.ca/Vancouver/index.cfm?tree=3,286,0,0#15620

A more detailed description of academic integrity, including the University's policies and procedures, can be found in the UBC Calendar at:
http://www.calendar.ubc.ca/Vancouver/index.cfm?tree=3,54,111,0

We believe that you will learn at least as much from each other as you will learn from the teaching staff. Therefore, we want to encourage collaboration without compromising a fair grading scheme (as described in the department's policy on collaboration).

In most instances, we will follow the "Gilligan's Island" (GI) rule of collaboration. That means that you can collaborate as much as you want with whomever you want subject to three restrictions:

1. You must acknowledge everyone with whom you collaborated on your submission.
2. You may not take a record of any sort away from the collaboration. (So, erase all whiteboards, delete all e-mail, recycle all paper, etc.)
3. You must spend at least an hour after the collaboration and before working on your own submission watching Gilligan's Island or performing the intellectual equivalent. In other words, do something so distracting and inane that you must have learned anything you can reconstruct afterward.

The exceptions to this rule are:

- On the project you may collaborate with your group. However, you will be asked to define how the collaboration worked. Note that collaboration with people outside your team still falls under full GI rules.
- Collaboration with the instructor and TAs (including discussion board posts) is excluded from the GI rules.

You may not collaborate at all on the midterm exams, the final exam, or any work that we explicitly state must be done individually. You may not use things such as Github Copilot, ChatGPT, or other such tools to do your work. All the work that you submit must be produced solely by you (or you and your teammates in the event of a deliverable that allows for collaboration). **Don't look for loopholes to cheating. Use common sense and don't cheat.**

You may be unable to destroy some records you create during collaborations (e.g., posts to the Piazza discussion board). In such cases, you should try to follow the spirit of the rule: exercise caution in the information you share (e.g., don't provide answers to problems but rather discuss similar problems or describe concepts).

Finally, use common sense. For example, carefully memorizing someone else's SQL query and then regurgitating it an hour later is still plagiarism and cheating.

Other Important Notes and Links

Equity & Inclusion

We aim to build a community where equity and inclusion are embedded in all aspects of campus life. If you require assistance related to issues of equity, discrimination or harassment please contact the Equity & Inclusion Office:

Brock Hall, Room 2306
604-822-6353
info@equity.ubc.ca
https://equity.ubc.ca

Health & Wellness

Health and wellness, both physical and mental, are important for academic success. If you are having difficulty with your studies, or feel overwhelmed, or are experiencing distress, UBC provides a number of resources to help. You can also find tips on how to approach a friend who may be experiencing difficulties. For more information, please visit:

https://students.ubc.ca/health-wellness

If you are seriously ill or are dealing with a significant issue (e.g., the death of a close family member) that may prevent you from performing well in your courses, please contact your instructor or your home faculty office, as soon as possible.

If you face similar circumstances for your final exam, please talk to your Faculty advising office *before* you take the exam. They will assist you in determining an appropriate course of action. Please note that different Faculties handle requests for academic concession in different ways. Links to further information for the Faculties of Arts, Science and Commerce are provided below:

Science: Exam Issues
Arts: Academic Concession
Sauder: Academic Concession

Centre for Accessibility (formerly Access & Diversity)

The Centre for Accessibility provides support for students with disabilities, chronic medical conditions, and other challenges. If this applies to you and you require academic accommodations to meet course objectives, please contact the Centre for Accessibility:

Brock Hall, Room 1203.
604-822-5844

accessibility@ubc.ca
https://students.ubc.ca/about-student-services/centre-for-accessibility

AMS Safewalk
If you find yourself in a situation where you do not feel safe travelling alone across campus at night and would like someone to accompany you, please contact the AMS Safewalk program by:

Calling 604-822-5355
Using a campus Blue Phone and asking for Safewalk
Dropping by their office in the Nest, Level 1, Room 1314

See also http://www.ams.ubc.ca/services/safewalk/

Finances for Technology

If you have financial difficulties acquiring the technology you need to participate fully in this course, please contact your Enrolment Services Advisor: https://students.ubc.ca/about-student-services/enrolment-services-advisors

Lastly, the **Faculty of Science** maintains a list of **resources** that students might find useful: https://science.ubc.ca/students/resources/

Policies and Resources to Support Student Success

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available here: https://senate.ubc.ca/policies-resources-support-student-success

Acknowledgements

Slides and other course materials are based on previous materials from others, especially the authors of the book (Raghu Ramakrishnan and Johannes Gehrke), Phil Bernstein, Alon Halevy, Hassan Khosravi, Ed Knorr, Raymond Ng, George Tsiknis, Steve Wolfman, and Jessica Wong. Thanks, folks.