



## COURSE OUTLINE

### 1. **Course:** MATH 271, Discrete Mathematics - Winter 2021

Lecture 01: MWF 09:00 - 09:50 - Online

Instructor	Email	Phone	Office	Hours
Dr Thi Dinh	tdinh@ucalgary.ca	403 220-2214	MS 420	MWF 11:00 - 12:00

Lecture 02: TR 11:00 - 12:15 - Online

Instructor	Email	Phone	Office	Hours
Dr Jerrod Smith	jerrod.smith@ucalgary.ca		MS 442	By appointment (via Zoom)

### Online Delivery Details:

Some aspects of this course are being offered in real-time via scheduled meeting times. For those aspects you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

This course has a registrar scheduled, asynchronous final exam. The writing time is 2 hours + 50% buffer time, but the exam can be written any time in a 24-hour window.

All course components will be delivered via D2L and Zoom.

**\* Students must check D2L for updates at least twice a week \***

**Instructor Office hours** are by **appointment only**. See D2L for detailed information.

See **D2L > Course Information** for additional details and important information.

The course is structured so that students may choose their preferred method of content delivery throughout the course. Below we outline three possible options for students to follow: **Lecture-based, Asynchronous, Hybrid**

**\* Students following any path should expect to spend 8-10+ hours per week working on this course \***

Topic-based **worksheets** and **supplemental notes for selected topics** will be provided for **all students**.

### Lecture-based Path Delivery Details

- **Live Synchronous Lectures via Zoom (MATH 271 L01 Dr. T. Dinh)**
  - MWF 9:00 - 9:50 Mountain Time
  - Attendance is **not** mandatory.
  - All sessions will be recorded and made available via D2L with lecture notes also made available.\*\*\*\*
  - Students registered in both sections L01 and L02 may attend.
  - Zoom links and recordings available via **D2L > Communication > Zoom**

\*\*\*\* For students who wish to follow the **Lecture-based path** but are unable to attend the live meetings (e.g., you are registered in L02), you are encouraged to watch the recorded lectures and attend the Q & A sessions outlined below.

### Asynchronous Path Delivery Details

- **Asynchronous Content Delivery**
  - Recommended weekly textbook reading
  - Short instructional videos
  - Fill-in-the-blank style lecture notes to be completed along with the videos
- **Live Drop-in Q & A and Group Problem-Solving Sessions (MATH 271 L02 Dr. J. Smith)**
  - TR 11:00 AM - 12:00 PM Mountain Time
  - Attendance is **not** mandatory.
  - Sessions will **not** be recorded. Notes taken by the instructor will be made available.

- Students registered in both sections L01 and L02 may attend.
- Zoom links and recordings available via **D2L > Communication > Zoom**

### Hybrid Path Delivery Details

Students may **mix and match** components of both the **Lecture-based** and **Asynchronous paths** to meet their **schedules** and **learning needs**.

### LAB 01 and LAB 02 Delivery Details

- **Live Drop-in Q & A and Problem-Solving with Teaching Assistants**
  - **LAB 01** Mondays 3:00 - 3:50 PM Mountain Time
  - **LAB 02** Wednesdays 3:00 - 3:50 PM Mountain Time
- Students are encouraged to attend the lab that they are registered in
- Labs provide students the opportunity to ask questions
- Teaching Assistants will also guide students through some problem solving activities

### Course Site:

D2L: MATH 271 L01-(Winter 2021)-Discrete Mathematics

**Note:** Students must use their U of C account for all course correspondence.

### Email Policy

- All **content** and **course-related questions** should be posted to the **D2L Discussion Boards**. Questions will normally be answered within 36 hours (except on weekends and holidays).
  - Do not expect a response if you email your instructor with a content or course-related question.
  - Do not expect a response if an identical question has already been answered on D2L.
- All questions of a personal nature (e.g. accommodations, missed assessments) should be directed to Dr. Jerrod Smith (jerrod.smith@ucalgary.ca). You can usually expect a response within 24 hours (except on weekends and holidays).

### 2. Requisites:

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

#### Prerequisite(s):

Mathematics 211 or 213.

### 3. Grading:

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Date
Assignments (4, equally weighted)*	30	Feb 5, Feb 26, Mar 26, Apr 9
Midterm Exam (1)**	35	Friday, March 12
Final Exam (1)***	35	To be scheduled by the Registrar

**On all assessments:** both **mathematical correctness** and **quality of mathematical writing** will be assessed

**Late submissions of assessments will not be accepted.**

**\* Assignment Information**

- There will be four (4) assignments, equally weighted at 7.5% each
- Due at 11:59 PM Mountain Time on the due date
- Submissions must be a **single PDF file** uploaded to the appropriate **D2L Dropbox**
- Students will have approximately one week to complete each Assignment
- Students may discuss assignment problems with their peers during the initial problem solving stages however, **students are expected to write assignment solutions independently.**
  - That is, students should not share written solutions to assignment problems.
  - D2L discussion boards will be created to facilitate problem-solving collaboration.
  - Students may **NOT** use external online "homework services" (See Section 7).
- **One question** (chosen at random) on each assignment will be assessed out of **15 points**

**\*\* Midterm Exam Information**

- Designed as a 2-hour written exam.
- Due at 11:59 PM Mountain Time on the due date
- Submissions must be a **single PDF file** uploaded to the appropriate **D2L Dropbox**
- The Midterm Exam will be available to be completed during the 24 hour period from 12:00 AM MT to 11:59 PM MT
- **Students are expected to complete the Midterm Exam independently.**
- **Students may** use all course materials posted to D2L while completing the Midterm Exam.
- Students may **NOT** use external resources or online "homework services"

**\*\*\* Final Exam Information**

- Designed as a 2-hour written exam.
- Due at end of the registrar scheduled time period
- Submissions must be a **single PDF file** uploaded to the appropriate **D2L Dropbox**
- The Final Exam will be available to be completed during the 24 period
- **Students are expected to complete the Final Exam independently.**
- **Students may** use all course materials posted to D2L while completing the Final Exam.
- Students may **NOT** use external resources or online "homework services"

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
<b>Minimum % Required</b>	95 %	90 %	85 %	80%	75%	70 %	65 %	60%	55%	53 %	50 %

This course will have a final exam that will be scheduled by the Registrar. [The Final Examination Schedule](#) will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

The final exam will be administered using an on-line platform. Per section [G.5](#) of the online Academic Calendar, timed final exams administered using an on-line platform, such as D2L, will be available on the platform. **Due to the scheduling of the final exams, the additional time will be added to the end of the registrar scheduled synchronous exam to support students.** This way, your exam schedule accurately reflects the **start time** of the exam for any **synchronous** exams. E.g. If a **synchronous** exam is designed for 2 hours and the final exam is scheduled from 9-11am in your student centre, the additional time will be added to the **end** time of the **synchronous** exam. This means that if the exam has a 1 hour buffer time, a synchronous exam would start at 9 am and finish at 12pm. - updated April 6, 2021

- the latest you should start an asynchronous exam would be 8 am in order to be able to submit the exam at 11am and have the full 3 hours.

#### 4. Missed Components Of Term Work:

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

If a student does not complete the Midterm Exam due to a legitimate reason (e.g., illness, ...) **and** contacts their instructor within the deadlines outlined above, then an opportunity to write an alternate examination will be provided. If necessary, the alternate midterm examination will take place in March 2021. The format and submission guidelines may vary for the alternate exam; this will be communicated to students if an alternate exam is necessary.

#### 5. Scheduled Out-of-Class Activities:

There are no scheduled out of class activities for this course.

#### 6. Course Materials:

Recommended Textbook(s):

Susanna S. Epp, *Discrete Mathematics with Applications, 5th edition*: Brooks/Cole.  
 Richard Hammack, *Book of Proof, 3rd edition*:: Richard Hammack: PDF available online:  
[https://www.people.vcu.edu/~rhammack/BookOfProof/.](https://www.people.vcu.edu/~rhammack/BookOfProof/)

#### Technology Requirements

Students **must** be able to **scan/photograph** written work and convert the images to **PDF files**. In particular, this is **required** to complete the **Midterm** and **Final Exam**.

- For iPhone / iPad try the *\*free\** Adobe Scan Digital PDF Scanner <https://tinyurl.com/tlhhkj3>
- On Google Play try the *\*free\** Adobe Scan Digital PDF Scanner <https://tinyurl.com/v7csw88>

Alternatively, students may create PDF files of written work by:

- writing with **tablet app** and saving to a **PDF file**
- **For Assignments ONLY** typing work with a LaTeX distribution (<https://www.latex-project.org/get/>) or online LaTeX editor (such as Overleaf <https://www.overleaf.com>) and saving to a PDF file. See D2L for more information about writing mathematics with LaTeX. **LaTeX is NOT permitted for the Midterm nor Final Exam.**

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

## 7. Examination Policy:

Students must submit **Assignments** and **Exams** as **single PDF files** (only).

This may be done by:

- Printing a copy of the exam, writing on the exam pages, and scanning your solutions (with a scanner or smartphone application).
- Using a tablet app to write your exam on a copy of the exam pages.
- Alternatively, if you are unable to print and do not have access to a tablet, then you may complete the assessment on 8.5" by 11" paper (**within indicated page limits**) and then scanning your solutions.
- **Assignments ONLY** may be submitted as a single PDF typeset with LaTeX
  - Assignments may also be submitted by completing the assessment on 8.5" by 11" paper and then scanning your solutions to a **single PDF file**.

### Assignment Expectations

- Assignments are intended to help you **practice problem solving** and **mathematical writing**.
- You should use your notes, the topic videos, and the course text(s) to help you assignments.
- You may discuss assignment problems with your peers on the D2L discussion boards; however, **you must write your assignment solutions on your own** (i.e., independently).
  - Please see the topic description of the Assignment Discussion Board for detailed instructions for how to discuss Assignments while maintaining Academic Integrity.
- **You may NOT use:** homework answer services, like Chegg.com, Slader, etc.
- **You may NOT use:** mathematics question & answer forums like Mathematics Stack Exchange
- We recommend that you only use (online) computer algebra systems like Wolfram Alpha, Mathematica, etc. to verify any necessary calculations that you have performed by hand.

### Midterm and Final Exam Expectations

- The exams are intended to assess your understanding of fundamental concepts, definitions and theorems, as well as to assess your problem solving skills and mathematical writing.
- **You must complete the Midterm and Final Exams on your own**, and **without help from your peers**
- You may refer to the notes you've taken on the fill-in-the-blank notes and all course notes posted to D2L
- **You may NOT use:** homework answer services, like Chegg.com, Slader, etc.
- **You may NOT use:** mathematics question & answer forums like Mathematics Stack Exchange
- We recommend that you do NOT watch the topic/lecture videos as you complete the exam
- We recommend that you do NOT refer to the course text(s) as you complete the exam
- We recommend that you do NOT use: (online) computer algebra systems like Wolfram Alpha, Mathematica, etc.

On all assessments, **be wary** of using external internet resources (course notes, You Tube videos, etc.); **you will be expected to use the standard notation, definitions, and constructions used in the lectures, videos and course notes**. Outside resources may use different conventions for notation, definitions, and standard constructions.

Students should also read the Calendar, [Section G](#), on Examinations.

## 8. Approved Mandatory And Optional Course Supplemental Fees:

There are no mandatory or optional course supplemental fees for this course.

## 9. Writing Across The Curriculum Statement:

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

## 10. Human Studies Statement:

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

## 11. Reappraisal Of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:**The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. **Other Important Information For Students:**

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Services:** For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([svsa@ucalgary.ca](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)  
[Student Academic Misconduct Policy](#) and [Procedure](#)  
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- e. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Mathematics & Statistics, Mark Bauer by email [bauerm@ucalgary.ca](mailto:bauerm@ucalgary.ca) or phone 403-220-4189. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). [Student Ombudsman](#), Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca).

- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

**Course Outcomes:**

- Distinguish among different types of proofs, including: direct proof, indirect proof, proof by contraposition, and proof by induction.
- Outline what must be included in the proof of a statement, being aware that this is highly dependent on the statement to be proved.
- Construct various types of proofs, including: direct proofs, indirect proofs, proofs by contraposition, and proofs by induction.
- Restate all definitions related to the course topics of number systems, sets, functions, relations, and graphs
- Restate named theorems covered in the course
- List different forms of logical statements and write the negation, the converse and the contrapositive of a statement.
- Perform the Euclidean algorithm to find the greatest common divisor of two integers and to find an inverse of an integer modulo  $n$ .
- List the steps in a direct proof, the steps in a proof by contradiction and the steps of a proof by induction
- Produce proofs involving objects covered in the course such as sets, functions, relations, and graphs.
- Outline and perform the steps required to solve counting problems concerning arrangements of objects and selection of objects.

Electronically Approved - Apr 08 2021 09:19

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**Department Approval**