UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

Department of Mathematics & Statistics
MS 476
403 220-5210
mathinfo@ucalgary.ca

COURSE OUTLINE

1. **Course:** MATH 311, Linear Methods II - Fall 2020

   Lecture 01: MWF 12:00 - 12:50 - Online

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

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

Live Synchronous Meetings

Wednesdays and **Fridays** from **12:00 PM - 12:50 PM** via **Zoom**

- Access Zoom via D2L > Communication > Zoom
- **Wednesday meetings:** OPTIONAL course topic Question & Answer (Q & A); informal group discussions about the current week's **video content**, **note/textbook readings**, **homework,** and **practice worksheets.**
- **Friday meetings:** Problem-Solving sessions and Mathematical Writing discussions; *participation is highly encouraged to ensure your success!*

Zoom meetings will NOT be recorded.

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.

Content Delivery

All course materials will be delivered via D2L. The course will primarily be delivered via short **instructional videos** posted to D2L, which students will watch **at their own pace** during each week following the **Course Schedule**. You should **pause** the videos and **take notes** and **try examples on your own** as you would during an in-person class.

Weekly **worksheets** will be provided to give students an opportunity to practice **problem solving** and **mathematical communication skills**. Students will be expected to attempt worksheet problems **before** the Friday meetings during which we will **discuss selected problems**, often **in small groups**.

Lecture notes associated with the videos will be provided. **Textbook readings** will also be assigned to supplement the **videos** and **lecture notes**.

See the **Course Schedule** on D2L for a detailed **schedule of topics.**

Course Site:

D2L: MATH 311 L01-(Fall 2020)-Linear Methods II

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.
- All questions of a personal nature (e.g. accommodations, missed assessments) should be directed to your instructor (jerrod.smith@ucalgary.ca). You can usually expect a response within 24 hours (except on weekends and holidays).

Outline of a Typical Week

See the Course Schedule for more details regarding **Deadlines**

- **Sunday**
  - **Odd # Weeks**: 11:59 PM Deadline: Lyryx Online Homework Assignment**
    - ** Assignment #0 (Review) is due in Week 4.
- **Monday**
  - **8:00 AM weekly course content posted on D2L**
  - **Odd # Weeks: 11:59 PM Deadline: Complete and Submit Quiz to D2L Dropbox**
    - Quizzes cover material from the **two weeks immediately preceding** the Quiz date.
  - Work through course content and Top Hat questions at your own pace.
  - Work on Lyryx Homework
- **Tuesday**
  - Work through course content and Top Hat questions at your own pace.
  - Work on Lyryx Homework
- **Wednesday**
  - **11:00 - 11:50 AM Mathematical Writing/Question & Answer Zoom Meeting**
  - Work on Lyryx Homework
  - **Even # Weeks: 11:59 PM Deadline: Writing Assignment Due via D2L Discussion Board**
- **Thursday**
  - Work through course content and Top Hat questions at your own pace.
  - Work on Lyryx Homework
  - **Even # Weeks: 11:59 PM Deadline: Responses to Peer's Writing Assignments due.**
- **Friday**
  - **11:00 - 11:50 AM Problem-Solving Zoom Meeting**
  - Work through course content and Top Hat questions at your own pace.
  - Work on Lyryx Homework

Expect to spend 7-10+ hours per week working on this course.

At a minimum, you should check D2L for updates on Mondays and Fridays.

2. **Requisites:**

See section 3.5.C in the Faculty of Science section of the online Calendar.

Prerequisite(s):
Mathematics 211 or 213.

Antirequisite(s):
Credit for Mathematics 311 and 313 will not be allowed.

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
Lyryx Online Homework* (7; weighted by question)	12 %	Sept 20, Sept 27, Oct 4, Oct 18, Nov 1, Nov 22, Dec 6
Quizzes** (6, equal weight, best 5 of 6)	60 %	Sept 21, Oct 5, Oct 19, Nov 2, Nov 23, Dec 7
Writing Assignments*** (6 discussion posts and replies, equal weight)	18 %	Sept 16, Sept 30, Oct 14, Oct 28, Nov 18, Dec 2
Top Hat**** (active learning exercises)	10 %	Weekly at students' pace; deadline: Dec 9 at 11:59 PM

See **D2L** > **Course Information** for a detailed schedule of topics and assessments deadlines.

*** Lyryx Online Homework**

- All questions are equally weighted; assignments are weighted by question
- Lyryx assignments have a **computational focus**

**** Quizzes**

- The lowest single quiz score will be dropped from final grade calculations.
  - *If a student misses a Quiz, then this is the score that will be dropped.*
- Designed as 50 minute Quiz; due at 11:59 PM on the due date
- Available to be completed during a 24 hour period from 12:00 AM - 11:59 PM
- Submissions must be a **single PDF file** uploaded to the appropriate **D2L Dropbox**

***** Writing Assignments**

Students will be placed into randomized groups via D2L for each Reading and Writing discussion activity.

- Posts due Wednesdays at 11:59 PM
  - Assessed as “acceptable (2 pts.)”, “needs improvement (1 pt.)” or “unacceptable (0 pts.)” based on the following:
    - At a minimum: “acceptable” posts will be submitted by the deadline, within the indicated word counts AND/OR include attachments if required, and address the discussion prompt. Writing will be of good quality, with correct spelling and grammar.
    - At a minimum “needs improvement” posts will be submitted by the deadline, within the indicated word counts AND/OR include attachments if required, and address the discussion prompt.
- Replies to each group member (usually 2-3 replies) due Thursday following original post at 11:59 PM
  - Assessed as “complete (1 pt.)” or “incomplete”. Completeness also includes using a rubric if instructed to do so.

****** Top Hat**

- Students will complete Top Hat questions at their own pace each week; there is no weekly deadline
- It is recommended that students **complete Top Hat questions** while **watching content videos** and **reading course lecture notes**
- Top Hat questions are graded as 1/2 participation + 1/2 correctness
- The **deadline** for completing **all Top Hat questions** is **Wednesday, December 9 at 11:59 PM**

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
Minimum % Required	95 %	90 %	85 %	80%	76%	72 %	68 %	64%	60%	55 %	50 %

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.

- The lowest single quiz score will be dropped from final grade calculations.
  - *If a student misses a Quiz, then this is the score that will be dropped.*
- All other instances of missed work will be handled on a case-by-case basis.

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

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

6. **Course Materials:**

   Required Textbook(s):

   W. K. Nicholson, *Linear Algebra with Applications*: Open text available through Lyryx or https://lila1.lyryx.com/textbooks/OPEN_LAWA_1/marketing/Nicholson-OpenLAWA-2019A.pdf..

   Recommended Textbook(s):

   Richard Hammack, *Book of Proof*: Richard Hammack, available at https://www.people.vcu.edu/~rhammack/BookOfProof/.

We will be using the **Lyryx** system for online assignment purposes, offering formative online assessment in an effort to support student learning. The student license is normally **$39.95+GST** payable upon registration on the Lyryx system. While computer labs for free access remain inaccessible during the COVID-19 restrictions, Lyryx is pleased to provide free individual licenses to students who can make the case of **severe financial needs** with their instructors.

We will be using **Top Hat** for asynchronous **active learning exercises**. University of Calgary students may access Top Hat **at no cost.** Students **must use their @ucalgary email address** for their **Top Hat account**. Students must ensure that their **UCID** is entered in their **Top Hat account information.**

You can access our **Top Hat** course **MATH 311 Linear Methods II F2020** via:

- A web browser on your computer** at http://app-tophat.com, or
- The Top Hat smartphone/tablet app

** Recommended option: Using a web browser on a computer is the best option for viewing mathematics.

Technology Requirements

In addition, students **must** be able to **scan/photograph** written work and convert the images to **PDF files.**

- 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

Alternative to scanning; students may create PDF files of written work by:

- writing with **tablet app** and saving to a **PDF file**
- *students will NOT be permitted to submit typed work for Quizzes*

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 quizzes as **single PDF files**. 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 quiz on **two (2) single-sided** pages of 8.5" by 11" paper and then scanning your solutions.

Writing Assignment (Discussion Post) Expectations

- Discussion posts 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 complete the posts.
- You should **complete the initial posts on your own** to ensure that you receive **maximum benefit** from reading your peer's posts and **receiving feedback on your posts** from your peers.
- **You may NOT use**: homework answer services, like **Chegg.com**, **Slader**, etc.
- **You may NOT use**: mathematics question & answer forums like Mathematics Stack Exchange or MathOverflow

Lyryx Assignment and Top Hat Expectations

- Lyryx Assignments and Top Hat questions are intended to help you **practice computational skills** and **problem solving,** and to **check your theoretical understanding**.
- You should use your **notes**, the **topic videos**, and the **course text(s) & lecture notes** to help you complete the assignments.
- You may **discuss assignment problems with your peers** on the D2L discussion boards; however, you should **complete your assignments on your own** (i.e., independently).
- **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** use (online) computer algebra systems like *Wolfram Alpha, Mathematica, etc.*

Quiz Expectations

- The Quizzes are intended to help you **assess your understanding** of fundamental concepts, definitions and theorems, as well as to assess your problem solving skills and mathematical writing.
- You should **complete quizzes on your own**, and **without help from your peers**
- **You may re-watch** the **topic videos** as you complete the quiz
- **You may** refer to the **notes you've taken** on the **fill-in-the-blank notes**
- **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** refer to the **course text(s)** as you complete the quiz
- 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 **videos** and **fill-in-the-blank 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 Center:** For more information, see www.ucalgary.ca/wellnesscentre or call 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) or phone at 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 misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K. Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples**.

    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 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 Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: 403-220-3913 Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: 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:

- Explore the relationship between key linear algebra concepts and their geometric representation.
- Seek to apply linear algebra techniques to a variety of practical problems.
- Read and create proofs of mathematical statements about topics covered in the course.
- State all of the technical definitions covered in the course (such as a vector space, span, independence, dimension, linear transformation, kernel, image, and other terms)
- State all of the relevant theorems covered in the course
- Use these definitions and theorems from memory to construct solutions to problems and/or proofs.
- Verify that an abstract mathematical object satisfies a given definition, or is a counterexample
- Analyze a finite dimensional vector space and its properties, including the basis structure of vector spaces
- Understand the concept of a linear transformation as a map from one vector space to another, and to be able to construct such maps given a basis of the domain
- Use the Gram-Schmidt process to produce an orthonormal basis

Electronically Approved - Sep 03 2020 11:24

Department Approval

Electronically Approved - Sep 03 2020 19:28

Associate Dean's Approval