

Course: M 105 Sec. B02 (CRN 35027) 3 cr., Spring 2021

Contemporary Mathematics

T,Th 11:00am–12:20pm in MATH 103 & on Zoom (ID: 993 5171 2735 passcode: 556128)

Instructor: Mark Kayll

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hs.UMT.edu/math/people/default.php?s=Kayll

Office: MATH 209
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Hours: T,Th 2:00–2:50pm & by appointment
(tentative) (open for all course matters, including DSS accomm.)

Prerequisites: either: M 090 (Introductory Algebra) with a minimum B– grade;
or: M 095 (Intermediate Algebra); Or: appropriate placement score; plus an open mind.

Reference: *Mathematics for Social Justice*, GIZEM KARAALI AND LILY S. KHADJAVI, MAA Press, 2019

Material: Three–four separate units, chosen from: Voting & Social Choice; Graph Theory (models of Human Trafficking); Finance (Student Loans); Statistics & Probability (Sustainable Social Security); Electoral Districting; Fair Division and Apportionment. We’ll follow readings posted on Moodle.

Important Dates:

last day to add w/o instructor consent	Wednesday, 20 January (5pm);
last day to drop or change to Audit	Monday, 1 February (5pm);
Student Breaks	Thursday, 4 March & Tuesday, 16 March;
last day to drop via Add/Change/Drop	
link and avoid ‘WP’ or ‘WF’	Thursday, 18 March (5pm);
last day to add/drop by petition	Friday, 23 April (5pm);
last class meeting (during finals)	Wednesday, 28 April 8:00–10:00am.

Description: Most people consider learning to read (literacy) necessary to function in modern society. Strangely, many consider learning the rudiments of mathematics (‘numeracy’) irrelevant to their lives. But just as literacy is necessary for written communication, so too is numeracy necessary for quantitative communication, not to mention its ties to analytical thinking. As its title suggests, M 105 is an introduction to contemporary mathematics. What does this mean? Usually one’s mathematical experience culminates with a shaky understanding of the fundamentals without ever enjoying the excitement of the ideas in action. Consequently, most people view mathematics as static: a ‘done deal’; yet new mathematical ideas and applications are discovered every day.

One course goal is to reveal several arenas in which mathematics arises naturally in the ‘real world’ and to examine how the subject is constantly evolving to tackle modern problems. Living in the information age, humans are bombarded daily with massive amounts of data: by advertisers, politicians, reporters, pollsters, recruiters, and lobbyists. It has become increasingly important to be equipped to analyze information critically. Thus, a second goal is to develop skills to reason logically and communicate mathematically. A third goal responds to a society in turmoil over issues of social justice. Mathematics contains tools and ideas to contribute to positive change; this course will explore these in a welcoming environment. A fourth and equally important goal is to have fun exploring the beauty (yes, beauty!) of mathematics.

Learning outcomes: The ‘official’ outcomes below are reflected in the description above.

1. Read mathematical material at an appropriate level, reason mathematically, and write using mathematical notation correctly.
2. Formulate a problem precisely, and interpret solutions.
3. Apply elementary probability theory to construct models of random phenomena, including the use of simulations.
4. Use elementary statistical tools such as measures of center and spread, graphical representations of data, and statistical estimation of population proportions.
5. Use tools from one or more areas of mathematics to solve theoretical or applied problems. The areas could include, but are not limited to, finance, management science (e.g., graph models for network problems), social choice and decision making (e.g., elections, voting, fair division, Congress apportionment), geometry (e.g., symmetry, tilings), or mathematical games.
6. Upon completion of the mathematical literacy requirement, a student will be able to apply effectively mathematical or statistical reasoning to a variety of applied or theoretical problems. [Gen Ed Math-Literacy Learning Outcome]

Accommodation: The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. The instructor will work with you and Disability Services to provide an appropriate modification.

Assessment: Course grades are based on homework assignments, two term tests, and a final exam. Traditional letter grades will be assigned using the +/- system (see *UM catalog* at catalog.UMT.edu/academics/policies-procedures). UM’s policy on Incomplete grades will be followed (see *UM catalog*).

Class attendance & activities: Attendance is taken and contributes to the “in-class work” portion of the grade. Class activities include: discussion, group work, and lectures. Often group work consists of worksheets which also contribute to the “in-class work”. Participation is necessary; learning mathematics is similar to learning to play a musical instrument or a new sport: one learns by *doing*, not by watching.

Readings: *Completing assigned readings is essential for this course.* Short, possibly unannounced, quizzes based on the readings will be given.

Homework: Problems are assigned based on the in-class work, and homework problems are discussed regularly in class. Assignments are collected and checked, but individual problems are not normally graded. Submission is electronic via [gradescope.com](https://www.gradescope.com), either in PDF or JPG format from your device. The course number is **224957**, with Entry Code **D5P6J3**. You’ll receive an email invite at your official UM email address; follow the instructions to link to **Gradescope** and get started.

Keep in mind that the only way to learn mathematics is to do mathematics. This means that students should be prepared to spend some quality time outside of class on this course. I urge students to acquire the habit of staying on schedule with reading and homework. This helps to maximize the material absorbed in class, meaning less effort preparing for tests.

Tentative grading schedule:	Item	Date(s)	Weight
	Homework	12 January — 22 April	20%
	In-class work	12 January — 22 April	20%
	Unit Test # 1	Thursday, 11 February	20%
	Unit Test # 2	Thursday, 25 March	20%
	Unit Test # 3	Wednesday, 28 April (during finals week)	20%

Teaching modality: This is a *hyflex* course; i.e., some students attend face-to-face while others join synchronously via Zoom. Class meetings will be recorded on Zoom so that all students can revisit desired segments.

Moodle pages: These are located at moodle.umt.edu/course/view.php?id=41562. Students should check the Moodle site regularly to stay in tune with the course flow (announcements, homework, grade book, etc.).

General Remarks

On credit: If you’re taking this course as a general education requirement, you must choose ‘traditional letter grade’, not CR/NCR. A ‘D–’ grade is considered passing and will earn course credit, but it will *not* fulfill the Gen Ed requirement. A minimum grade of ‘C–’ is needed to fulfill the Gen Ed Math-Literacy requirement.

On homework: You may work with others on homework problems, and you’re encouraged to do so; however, **Solutions should be written down privately in your own words.**

On tests: Each test will be based on the material from the corresponding unit (i.e. no cumulative tests).

On make-ups: Make-ups for tests will *not* be given unless there is a valid excuse cleared with the instructor *prior* to the test. At least one of your most detrimental homework/in-class work scores will be dropped; thus, there are no make-ups for quizzes, homework, or class work.

On deadlines: Any stated deadlines will be firm; please do not ask for extensions.

On electronic devices: Cell phones must be silenced during class meetings and office hour visits. Use of a cell phone during a test for any purpose other than as a calculator is grounds for earning a zero score on that test.

On coronavirus: Attendance will be recorded to support contact tracing. All students must follow UM’s face covering policy; see www.umt.edu/policies/browse/facilities-security/covid-19-face-covering-policy. With mask use required in the classroom, consuming food or beverages is not allowed because these require mask removal.

On conduct: All students need to be familiar with the Student Conduct Code; it can be found in the ‘A to Z Index’ on the UM home page. All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the university.

