UNIVERSITY OF MONTANA

Course: M 105 Sec. 04 (CRN 31025) 3 cr., Spring 2017
Contemporary Mathematics
MWF 12:00–12:50pm in MATH 211

Instructor: Mark Kayll

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Office: MATH 209
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Hours: M 2:00–2:50pm, Th 10:50–11:40am & 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: M01 placement ≥ 19, or ALEKS placement ≥ 3,
or ACT score of 22, or SAT score of 550 (with the new test); plus an open mind.

Text: *Quantitative Literacy*, 2nd ed, B. Crauder et al., Freeman Publishing, 2015

Text options/info: The course coordinator and the UM Bookstore cooperated with the publisher to bring the course materials at a competitive price through UM's *Inclusive Access* program. This program gives access to Web**Assign** which provides an e-book and supplemental learning programs. There is also a print-on-demand option; if you want a hardcopy of the text, visit the Bookstore's textbook department to make a request ($20 extra). The main cost ($65) was already charged to your student account; those wishing to opt out and locate their own materials can cancel their access via Moodle and visit the Bookstore for a refund.

Web**Assign** access: you'll need the instructor's name and course section, together with the Class Key: umontana 5624 5194

Material: Three–four separate units, chosen from: Voting & Social Choice; Graph Theory; Finance; Statistics & Probability; Geometry; Mathematics & Music. We'll use portions of the text and handouts.

Important Dates:

last day to add by Cyberbear	Tuesday, 31 January (5pm);
last day to drop by Cyberbear, or select Audit grade option	Friday, 10 February (5pm);
Presidents' Day holiday	Monday, 20 February;
spring break	20–24 March;
Math Awareness Month	April (watch for events);
last day to add/drop by paper form	Monday, 3 April (5pm);
last day to add/drop by petition	Friday, 5 May (5pm);
last class meeting (during finals)	Wednesday, 10 May 10:10am–12:10pm.

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 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.

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: *Reading the text and handouts 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. *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 you to acquire the habit of staying on schedule with your reading and homework. This helps to maximize the material you're able to absorb in class, meaning less effort preparing for tests.

Free tutoring: Math@Mansfield, Mansfield Library main floor next to the Copy Center. Hours will be announced once they've been determined.

Assessment: Grades are based on homework assignments, in-class work, and three term tests. Traditional letter grades will be assigned using the $+/-$ system (see *UM catalog* at www.umt.edu/catalog/academics /academic-policy-procedure2.php). UM's policy on Incomplete grades will be followed (see *UM catalog*).

Tentative **grading schedule:**

Item	Date(s)	Weight
Homework	23 January — 5 May	20%
In-class work	23 January — 5 May	20%
Test # 1	Friday, 24 February	20%
Test # 2	Wednesday, 5 April	20%
Test # 3	Wednesday, 10 May	20%

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.

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 visits to my office. 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 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.