

Mathematics 105: Contemporary Math

Spring 2012

Course Lecturer: Nick Grener

Office: Corbin 355

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Office Hours: Monday and Wednesday 2:00-3:30 in the MLC (basement of Math building). If this conflicts with your class/work schedule, e-mail me and we can make an appointment to meet at another time.

Catalog Description: (from <http://www.umt.edu/catalog/mathsci.htm>)

U 105 Contemporary Mathematics 3 cr. Offered every term. Prereq., MATH 095D or appropriate placement score. An introduction to mathematical ideas and their impact on society. Intended for students wishing to satisfy the general education mathematics requirement.

Required Text: *For All Practical Purposes*, 8th ed., COMAP.

Required Tools: Some sort of calculator is required, as you may not share calculators on exams. A graphing calculator may be useful at some points in the course, but it is certainly not mandatory (graphing calculators are available to borrow in the math office).

Class Web Page: <http://www.math.umt.edu/105>

Course Coordinator: The organizer of all sections of this course, and the first person to see with complaints, questions, etc. about this course that cannot be resolved with me.

Lauren Fern

Math 205B

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Free Tutoring:

MLC: Monday - Thursday from 10 am – 4 pm

Math @ Mansfield: Monday - Thursday from 11 am – 3 pm, and Sunday - Thursday from 6:30 pm – 9 pm

Learning Goals:

1. To attain some degree of mathematical literacy, including an ability to read mathematical material and write using mathematical notation correctly. To develop skills to think and reason mathematically in order to function more effectively in the modern world.
2. To examine ways in which mathematics is used, to follow and understand logical arguments, and to solve applied quantitative problems. This includes learning to formulate a problem precisely, to interpret solutions, and to make critical judgments in the face of competing formulations and solutions.
3. To understand elementary probability concepts and phenomena: including sample spaces with equally likely outcomes, the basic parameters (mean, standard deviation), the normal distribution, and a qualitative view of the Central Limit Theorem.
4. To understand elementary statistical concepts, such as data description, statistical estimation, randomization, and statistical inference.
5. To explore and examine several other aspects of contemporary mathematics. This could include, but is not limited to, social choice (elections and voting), decision making (fair division and Congressional apportionment), and Bayes' Theorem (interpreting results of drug and medical tests).

Grading: If you are taking this class to meet general education requirements, you must select the traditional grade rather than Credit/no credit. The course is divided into three units; at the end of each unit there will be a 100-point in-class midterm. Any arrangements for the make-up of missed tests must be scheduled **prior** to the test date. If a test is missed without making prior arrangements, the grade is recorded as a zero.

There will be 10 homework assignments throughout the semester, which will be due at the beginning of class on Fridays (no homework will be due during exam weeks). Each homework will be graded out of 20 points, and your lowest two homework scores for the semester will be dropped. For the most part, collaboration on homework with other members of the class is allowed, although solutions must be submitted individually and collaborators must be acknowledged. **Since your lowest two homework scores get dropped, homework will not be accepted late for credit.** You should turn in whatever you have completed of the assignment at the beginning of class on the day it is due. As such, it is a good idea to get started early on each assignment so that if any questions arise, you can get them addressed during office hours.

Your final grade in this class will be calculated by adding your three midterm scores and eight highest homework scores together and dividing by 460 (the total number of points possible). Grades will be assigned on the following scale:

A: $\geq 90\%$ **B:** $\geq 80\%$ **C:** $\geq 70\%$ **D:** $\geq 60\%$ **F:** $< 60\%$

There be a final administered on May 8 that is completely optional for everybody in the course. If you decide to take the final, it cannot hurt your grade in the course. If you do well on the final, your score on it will replace your lowest midterm grade in the final course grade calculation.

Add/Drop Policy: The last day to add/drop or change grading option to Audit by Cyberbear is Feb. 10. The last day to change sections and to change grading options is Mar. 26; this is also the last day to drop. Changes after this deadline and until May 4 must be done by petition and be approved by me, your advisor and the appropriate Dean. Approval requires genuine extenuating circumstances as listed in the university catalog. Extenuating circumstances are:

1. Missing a substantial number of classes due to illness, accident or family emergency.
2. A change in work schedule that makes it impossible to attend class or devote adequate time to the course.
3. Registration in the course by error and never attending class.

Reasons that are not satisfactory include:

1. Forgetting to turn in a drop slip.
2. Protecting your grade point average.

Incomplete (I) Grades: To be eligible for an "I", the following conditions must be met:

1. The student must have been in attendance and he passing the course up to 3 weeks before the semester ends; and
2. The student is unable to complete the course due to extenuating circumstances, which usually means serious illness or death in the family.

Incompletes are not given under any other circumstances and are always given at the discretion of the instructor. See the 2011-2012 catalog for further information.

Misconduct: 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. All students need to be familiar with the Student Conduct Code. Available for review online at <http://www.umt.edu/SA/VPSSA/index.cfm/page/1321>

Special Accommodations: Students with disabilities are welcome to discuss accommodations with me.

Important University-Wide Info and Dates:

- Friday, 10 February, 5:00 pm: Last Day to Add/Drop by CyberBear. Also last day to select AUDIT option. After this date, a drop results in W on transcript and no refund is given.
- Monday, 20 February: President's Day- NO CLASS
- 2 -6 April: SPRING BREAK
- Monday, 26 March, 4:30 pm: Last Day to Drop by Paper Form. Transcript will show WP or WF. \$10 fee.
- Friday, 27 April 5:00 pm: Last Day to Withdraw from all courses
- Friday, 4 May, 4:30 pm: Last Day to petition for a drop or change of grading option

Tentative Weekly Outline (Note that the midterm dates are set, though):

1/23 – 1/27: Course outline, Chapter 5

1/30 – 2/3: Chapter 5

2/6 - 2/10: Bayes' Theorem and Chapter 7

2/13 – 2/17: Chapter 7

2/22 – 2/24: (No class on President's Day) Simpson's Paradox

2/27 – 3/2: Review, Midterm # 1 on Wed. Feb. 29

3/5 – 3/9: Chapter 9

3/12 – 3/16: Chapters 9 and 13

3/19 – 3/23: Chapter 13

3/26 – 3/30: Review, Midterm # 2 on Wed. Mar. 28

4/2 – 4/6: Spring Break

4/9 – 4/13: Chapter 21

4/16 – 4/20: Chapters 21 and 22

4/23 – 4/27: Chapter 22

4/30 – 5/4: Review, Midterm # 3 on Wed. May 2

Optional Final: Tuesday, May 8, from 3:20 pm – 5:20 pm

HW # 1 – due Friday, Feb. 3

Chapter 5 : # 3, 4, 10, 15, 21, 22

And these extra problems:

A) The average monthly high temperatures in Seattle (in degrees Fahrenheit) are:

January	47	February	50
March	54	September	71
April	59	October	60
May	64	November	51
June	70	December	46
July	76	August	76

Create two separate line graphs that display this data. In graph I, scale the axes so that upon first glance, it looks like the temperature in Seattle stays pretty consistent throughout the year. In graph II, scale the axes so that upon first glance, it looks like the temperature varies drastically throughout the year. (Note that here we are displaying categorical data, not the distribution of quantitative variable like we do in most of chapter 5.)

B) Create a set of 7 whole numbers that has all of the following properties: the mean of the set is 8, the mode of the set is 9, and the median of the set is 7.

HW # 2 – due Friday Feb. 10

Chapter 5 : # 17 (give an answer with 6 data points), 30, 37, 40, 42, 47, 48, 57