

University of Montana

ScholarWorks at University of Montana

University of Montana Course Syllabi, 2021-2025

Spring 2-1-2022

M 115.50: Probability and Linear Mathematics

Ariel C. Cornelius

University of Montana, Missoula, ariel.cornelius@umontana.edu

Follow this and additional works at: <https://scholarworks.umt.edu/syllabi2021-2025>

Let us know how access to this document benefits you.

Recommended Citation

Cornelius, Ariel C., "M 115.50: Probability and Linear Mathematics" (2022). *University of Montana Course Syllabi, 2021-2025*. 35.

<https://scholarworks.umt.edu/syllabi2021-2025/35>

This Syllabus is brought to you for free and open access by ScholarWorks at University of Montana. It has been accepted for inclusion in University of Montana Course Syllabi, 2021-2025 by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.

**Mathematics 115 – Probability and Linear Math Online
Grading and Policies Spring 2022**

Contact Professor:

- ✓ **Lecturer:** Ariel Cornelius
- ✓ **Email:** ariel.cornelius@umontana.edu

Catalog Description:

<http://www.umn.edu/catalog/colleges-schools-programs/humanities-and-sciences/mathematical-sciences/default.php>)

M 115 - Probability and Linear Mathematics

Credits: 3. Offered every term. Prereq. M 090 with a grade of B- or better, or M 095, or M01 placement ≥ 17 , or ALEKS placement ≥ 3 , or ACT score of 22, or SAT score of 550(with the new test). Systems of linear equations and matrix algebra. Introduction to probability with emphasis on models and probabilistic reasoning. Examples of applications of the material in many fields.

Learning Outcomes: Upon completion of this course, students will be able to:

1. Find, understand and use linear equations to solve application problems.
2. Set up and solve systems of linear equations, and apply them appropriately.
3. Set up and solve linear programming problems (graphical method only).
4. Use linear regression and understand its uses as well as its limitations.
5. Use basic probability: sample spaces with equally likely outcomes, counting, conditional probability, Bayes' theorem, binomial probabilities, probability distributions, tree diagrams, Venn diagrams, two-way tables.
6. Use probability distributions: the binomial and normal distributions, and the normal approximation to the binomial distribution.
7. Use descriptive statistics: graphical displays, measures of center and spread.
8. Solve word problems involving the above concepts (this includes being able to precisely formulate a problem, and to interpret solutions).

General Education Learning Outcomes:

Upon completion of the mathematical literacy requirement, a student will be able to effectively apply mathematical or statistical reasoning to a variety of applied or theoretical problems.

Course Content:

1. Sets and Probabilities (Sets, Applications of Venn Diagrams, Basic Concepts of Probability, Conditional Probability; Independent Events, Bayes' Theorem)
2. Counting principles; Further Probability Topics (The Multiplication Principle, Permutations, Combinations, Probability Applications of Counting Principles, Binomial Probability, Probability Distributions; Expected Value)
3. Statistics (Frequency Distributions; Measures of Central Tendency, Measures of Variation, The normal distribution, Normal Approximation to the Binomial Distribution)
4. Linear Functions (Slopes and Equations of Lines, Linear Functions and applications, linear vs. exponential functions)
5. Problem Solving Guidelines, Uses of Percentages, Orders of Magnitude
6. Linear Programming, The Graphical Method (Graphing Linear Inequalities, Solving Linear Programming Problems Graphically, Applications)

Text:

We will use a compilation of Open Educational Resource texts all of which are free of charge and available to download through a link on the MyOpenMath site. You can order a printed copy as well through Lulu.com for a small fee. Access to MyOpenMath and a graphing calculator are also required. A graphing calculator with symbolic capability, such as a TI-89, TI-92 or anything CAS will not be allowed exams. Please note that there are downloadable calculators and apps that are fairly inexpensive if not completely free of charge.

For an orientation on enrolling and getting started with the MyOpenMath, please view:

https://www.youtube.com/watch?v=_IdFpaVYsgU&feature=youtu.be

To enroll in our course on MyOpenMath: go to www.myopenmath.com and note that our course ID is **131367** and the enrollment key is: **mathiscool**

This is the site where you can access the texts, online homework and videos that are linked to the text, tests, and the online homework gradebook. Regarding the online homework, you will have the opportunity to try each question several times, and if you continue to get it incorrect, you can click “similar problem” for additional attempts. It is strongly recommended that if you do not get the question correct on the first couple of tries; that you access the associated video (if one exists) that is linked to that particular homework question. It is essential that you do these assignments daily.

Please note that within each course topic on MyOpenMath, there are several short videos available that provide brief explanations and examples of various relevant topics. I encourage you to view these for additional explanations, as needed. You will also see such videos linked to random homework problems throughout the course.

How the Course is Run:

Online courses require a lot of self-teaching. In order to make this process easier on you, there are several short videos linked into each lesson as well as to many of the online homework questions.

I would recommend that you start learning each section in the following manner: first skim through the section in the textbook. Next, watch the videos(s) for that section. Then go and work the homework problems. Of course, you are always welcome to work additional textbook problems for extra practice.

Assignments:

All homework assignments will be completed on MyOpenMath. You are allowed 5 attempts per question so this should allow you ample opportunity to complete the assignments successfully. At times the program is rather picky (they may want fractions as opposed to decimals, for example). IF you believe that the program has made an error or you are unsure why your answer is incorrect PLEASE email me and I will get back to you on what you did wrong (if anything) or how to enter your solutions correctly.

Tests:

The tests are also on MyOpenMath. The tests are open the week of the due date. If you would like to take a test earlier than the week of the test, please contact me. While you will be taking the tests on MyOpenMath, I require everyone to submit their work to Moodle so that partial credit.

Tests need to be taken within the 3 hour time frame to receive credit. During tests, you may use calculators and a sheet of paper with notes. If you do not have a printer or scanner, I am fine with you working on the test neatly on a separate sheet of paper. Once you complete the test, please either scan or take pictures of your work. I do not want technology to be any sort of barrier for anyone so please feel free to contact me should you need any special accommodations regarding such. I am more than happy to work with each of you so that you are able to complete the class successfully.

Suggestions/Advice:

1. It is strongly recommended that you check your campus email daily.
2. You should begin each chapter by reading the assigned sections in your text book and watching the corresponding section videos. Some students find it useful to watch the videos first, and then read the text (and maybe watch the videos again).
3. Coursework should be done daily. There is no time limit on homework assignments. You can attempt the same question up to 5 times and still receive full credit. Use your notes from the videos as well as your textbook when needed.
4. If any questions arise, PLEASE contact me. Your success in this course will depend upon the amount of time and effort you are willing to spend with the material. You should plan to spend at least 10 hours per week reading your text, reviewing notes, working on homework, completing quizzes, and studying for exams.
5. It is assumed that you are able to use the basic features of your calculator and that you have a working knowledge of all material covered in the prerequisite course. While I understand that some of the material was not mastered by all students in the prerequisite course or that the prerequisite course was taken years ago, it is your responsibility to seek assistance if it is needed. You should start by reading the textbook and its examples. You will find that the material comes back quickly. You are strongly encouraged to ask questions.

Grading:

Your course grade will be based on the following:

- | | |
|--------------------|---|
| 70% of your grade: | Tests |
| 30% of your grade: | Online Homework with the lowest two scores dropped. |

<i>Grade</i>	<i>Grading Scale by Percentages</i>
A	90%+
B	89-80%
C	79-65%
D	64-55%
F	Less than 55%
CR	≥ 55%

*** If you are taking this course to fulfill a general education requirement or a requirement for your major or minor, you must take it for a traditional letter grade (not CR/NCR). If you decide anyhow to take this course with CR/NCR grading, a grade of “D-“is considered passing and will earn you credit for the course, BUT it will NOT fulfill your general education requirement NOR any requirement for your major or minor.***

Add/Drop Policies:

The last day to add/drop or change grading option to Audit by Cyberbear is **2/7**. The last day to change sections and to change grading options is 3/29. This is also the last day to drop. Changes after this deadline and until **5/6** must be done by Petition to Drop/Add after deadline and 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 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 2021-2022 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](#).

Disability modifications:

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Office for Disability Equity](#). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406.243.2243. I will work with you and Disability Equity to provide an appropriate modification.

Important University-Wide Info and Dates:

- Monday, February 21: Presidents Day. No school.
- Monday-Friday, 21-25 March: Spring Break. No school.

Student Hours: My student/office hours are for you to seek direct help from me. All office hours will be virtual, using Zoom. I am available every Wednesday from 4 pm to 5 pm. I am also available by appointment. Please come see me with any concerns you have during the semester, especially if there is something going on that is having an impact on your ability to succeed in the class. You can also come see me during these hours for help on math, just as you would get help in the math lab. Don't wait until you are way behind to get help! It is strongly recommended that you communicate with me as much as possible so that we can work together to get you through the course successfully.

Join Zoom Meeting <https://zoom.us/j/96534026211> Meeting ID: 965 3402 6211 Passcode: 578009

Tutoring:

Free tutoring is available on both the Mountain and River Campuses; links and hours will be announced as soon as they are provided.

Student: As a student, you may experience a range of challenges that can interfere with learning, such as health: strained relationships, increased anxiety, substance abuse, feeling down, difficulty concentrating, and/or lack of motivation. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. Counseling is available and treatment does help. The professional staff at Curry Health Center offers free confidential counseling to full-time students. I am always happy to help you find the resources you need.

A Statement on Digital Access and Equality:

Digital devices (like laptops and cell phones) are becoming increasingly important to success in college. In this course, you may need digital devices to access readings, complete and submit written assignments, complete online quizzes, verify your attendance, take in-class polls, coordinate with other students regarding group projects, complete and submit group projects.

I recognize that some students are unable to afford the cost of purchasing digital devices and that other students rely on older, more problem-prone devices that frequently break down or become unusable. I also recognize that those technology problems can be a significant source of stress for students. Given those challenges, I encourage students to contact me if they experience a technology-related problem that interferes with their work in this course. This will enable me to assist students in accessing support.

Here is some information in case you or another student you know faces challenges securing food or housing. There are some campus resources that might be helpful:

Food Pantry Program: UM offers a food pantry that students can access for emergency food. The pantry is open on Tuesdays from 9 to 2, on Fridays from 10-5. The pantry is located in UC 119 (in the former ASUM Childcare offices). Pantry staff operate several satellite food cupboards on campus (including one at Missoula College). For more information about this program, email umpantry@mso.umt.edu, visit the pantry's website (<https://www.umt.edu/uc/food-pantry/default.php>) or contact the pantry on social media (@pantryUm on twitter, @UMPantry on Facebook, um_pantry on Instagram).

ASUM Renter Center : The Renter Center has compiled a list of resources for UM students at risk of homelessness or food insecurity here: <http://www.umt.edu/asum/agencies/renter-center/default.php> and here: <https://medium.com/griz-renter-blog>. Students can schedule an appointment with Renter Center staff to discuss their situation and receive information, support, and referrals.

Accessing Online Homework in MyOpenMath

If you do not already have a MyOpenMath account:

- 1) Open up your web browser (like Internet Explorer, FireFox, Safari, or Chrome)
- 2) Enter the address: **www.myopenmath.com**
- 3) Click "Register as new student"
- 4) Enter the requested information.
- 5) Where it says "Select the course you'd like to enroll in", leave "My teacher gave me a course ID (enter below)" selected, and enter this class's course id and key:
Course ID: **131367**
Enrollment key: **mathiscool**
- 6) Click "Sign-up"
- 7) You will taken back to the login page. Enter your username and password you selected
- 8) You may see a "Browser Check" page. If so, click the "Continue with Image-based display" button.
- 9) The course name will now show up in the "Courses You're Taking" box on your home page. Click on the course name to enter the course.

The next time you want to access the course, you will just need to enter your username and password at the login page, then click on the course name to re-enter the course.

If you already have a MyOpenMath account:

- 1) Log into myopenmath.com
- 2) Click the "Enroll in a New Course" button.
- 3) Enter the course ID and enrollment key from #5 above, and click Sign Up.
- 4) The course name will now show up in the "Courses You're Taking" box on your home page. Click on the course name to enter the course.

Calendar:

1/17 - 1/21	Lesson 1
1/24 - 1/28	Lessons 2
1/31-2/4	Lessons 3
2/7-2/11	Lessons 4
2/14-2/18	Lesson 5 and Test 1
2/21-2/25	Lesson 6
2/28-3/4	Lesson 7
3/14-3/18	Lesson 8 and 9
3/21-3/25	SPRING BREAK
3/28-4/1	Lesson 10
4/4-4/8	Lesson 11
4/11-4/15	Test 2 and Lesson 12
4/18-4/22	Lessons 13 and 14
4/25-4/29	Lessons 15 and 16
5/2-5/6	Lessons 17
5/9-5/13	Test 3