

University of Montana

ScholarWorks at University of Montana

University of Montana Course Syllabi, 2021-2025

Spring 2-1-2022

M 115.07: Probability and Linear Mathematics

Scott Lindley Davis

University of Montana, Missoula, scott.davis@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

Davis, Scott Lindley, "M 115.07: Probability and Linear Mathematics" (2022). *University of Montana Course Syllabi, 2021-2025*. 33.

<https://scholarworks.umt.edu/syllabi2021-2025/33>

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
Grading and Policies Spring 2022**

Contact Professor:

- ✓ **Lecturer:** Scott Davis
- ✓ **Email:** scott.davis@umt.edu
- ✓ **Office Hours:** Tue: 11-12; Thu: 1-2, Fri: 10-11, and by appointment. All office hours will be held in the Learning Center, but meeting virtually is an option if you email me to set it up!

Catalog Description:

<http://www.umt.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. Classroom demonstrations will be done with a TI-84. A graphing calculator with symbolic capability, such as a TI-89, TI-92 or anything CAS will not be allowed on quizzes or 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 **135523** 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 five times, and if you continue to get it incorrect, you can click “similar problem” for additional attempts. If you do not get the correct solution in the first several attempts, PLEASE take advantage of the resources available to you (associated video, go to the math center, my office hours, or use the ‘contact instructor’ feature in the system). **It is essential that you do these assignments daily. But I know life gets in the way, so all students will have 4 ‘Late Passes’ which you can use for a 24-hour extension.**

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.

Grading:

Your course grade will be based on the following:

- 40% of your grade: Unit Tests, schedule TBA (the tests occur after Lessons 5 and 11)
- 20% of your grade: Final Exam. Note this is a cumulative final exam and the first half covers lessons 12-17.
- 20% of your grade: Class Activities, with the lowest two dropped (there are **no** make-ups).
- 20% of your grade: Online Homework with the lowest two scores dropped.

Please note that this class is highly interactive hence attendance and participation are essential for success in the class. You are expected to be in class every day it meets.

If a student’s final exam percentage is greater than any one of the tests during the regular semester, I will replace the lowest test grade with that percentage. The final exam cannot be replaced.

When any assignment is returned, there is one week from the date of return for contesting the grading. After that time, the grade will be accepted as final. All tests and assignments to be turned in are announced well before-hand and an email will also be sent to the class alerting you of an upcoming due date. It is your responsibility to keep up to date on all such announcements.

<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.***

Make-ups:

THERE ARE NO MAKE-UPS for the lab activities, regardless of the reason (e.g. sickness, sports, family emergency, etc.); this is why the lowest two are dropped as well as why there is a fairly large window in which they can be submitted. It is your responsibility to notify me as soon as you know you will miss any exam and it must be either prior to or within 24 hours of the exam. **If I do not receive an email within that period, the test score will be a 0. At most one make-up exam will be given.**

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](#). **In this course, cheating will result in a 0 for that assessment. A second infraction will result in an E for the course.**

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 expectations:

Criteria for work turned in: In a math class I firmly believe that the process is much more important than the final answer. A solution with no work or steps shown does not demonstrate one's understanding of the material, and thus will not receive full credit. All work turned in must be neat and orderly, written IN PENCIL (this includes exams) OR TYPED (group projects). I will post solutions to most assessments online – **be sure that you understand the process**, not just the final answer!

Attendance: Attendance is a required component of the course. If you must be absent, you are responsible for obtaining missed assignments and announcements (such as upcoming tests and activities), and being prepared for the next class.

Email: Students are expected to maintain an active email account and to **check email daily**.

Preparation: Students are expected to come to all classes prepared, with assignments complete, even if they have been absent.

Electronics: Students are expected to keep all phones and other personal electronics away/off during class. Calculators and laptops being used for class work will be acceptable.

Attendance/Participation: Students are expected to attend every class, to be on time for class, and to stay for the entire class period. Students who miss class are expected to complete the day's work and stay on schedule. Attendance is very important in this course. The only excused absences will be those due to required participation in university-sanctioned events such as athletic competitions, musical performances, and class trips. Students are expected to participate in all class activities, including individual work, group work, and work shared with the rest of the class. Full class participation involves bringing all relevant materials, staying on task, contributing to group activities, fostering a positive learning environment, answering questions when called upon by your instructor, and keeping all non-essential electronic devices away. *Sometimes you may think that you don't have time to attend class due to other matters, but past experience has shown that students who miss class actually spend far more than 50 minutes making up what they missed.*

A portion of class time will be spent working in small groups. The benefit of discussion while working in small groups to develop and use mathematical concepts has been shown to increase success rates. Brain research has shown that sharing multiple viewpoints and verbally articulating questions and answers strengthens the connections your brain makes between concepts. Strong connections improve your ability to recall and use concepts. Even if you think you already understand a concept, explaining your understanding to others benefits others while strengthening your own understanding. If you ask a question of your group or class, you are providing an opportunity for good discussion, so don't be shy about asking questions! The only bad question is one that is left unasked!

On coronavirus: All students are expected to follow UM's face covering policy (see www.umt.edu/policies/browse/facilities-security/covid-19-face-covering-policy).

Resources:

Student Hours: My student/office hours are for you to seek direct help from me. I am available during all announced hours as well as other times 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. Meeting Virtually for office hours will be an option, email me to set this up!

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: **135523**
 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.

The following schedule **is** subject to modifications (and in all probability will be changed due to timing!). **It is your responsibility to keep up to date on all such announcements.**

Monday	Tuesday	Wednesday	Thursday	Friday
Jan 17 MLK Day	Jan 18	Jan 19 Intro/Lesson 1	Jan 20	Jan 21 Lesson 1
Jan 24 Lesson 1	Jan 25	Jan 26 Lesson 1	Jan 27	Jan 28 Lesson 2
Jan 31 Lesson 2	Feb 1	Feb 2 Lesson 2/3	Feb 3	Feb 4 Lesson 3
Feb 7 Lesson 3	Feb 8	Feb 9 Lesson 4	Feb 10	Feb 11 Lesson 4
Feb 14 Lesson 5	Feb 15	Feb 16 Lesson 5	Feb 17	Feb 18 Test 1
Feb 21 Presidents Day	Feb 22	Feb 23 Lesson 6	Feb 24	Feb 25 Lesson 6
Feb 28 Lesson 6/7	Mar 1	Mar 2 Lesson 7	Mar 3	Mar 4 Lesson 7
Mar 7 Lesson 8	Mar 8	Mar 9 Lesson 8	Mar 10	Mar 11 Lesson 9
Mar 14 Lesson 9	Mar 15	Mar 16 Lesson 10	Mar 17	Mar 18 Lesson 10
Mar 21 SPRING BREAK	Mar 22 SPRING BREAK	Mar 23 SPRING BREAK	Mar 24 SPRING BREAK	Mar 25 SPRING BREAK
Mar 28 Lesson 10	Mar 29	Mar 30 Lesson 11	Mar 31	Apr 1 Lesson 11
Apr 4 Lesson 11	Apr 5	Apr 6 Test 2	Apr 7	Apr 8 Lesson 12
Apr 11 Lesson 12	Apr 12	Apr 13 Lesson 13	Apr 14	Apr 15 Lesson 13
Apr 18 Lesson 14	Apr 19	Apr 20 Lesson 14	Apr 21	Apr 22 Lesson 15
Apr 25 Lesson 15	Apr 26	Apr 27 Lesson 16	Apr 28	Apr 29 Lesson 16/17
May 2 Lesson 17	May 3	May 4 Lesson 17	May 5	May 6 Review