Spring 1-2016

M 115.06C: Probability and Linear Mathematics

Blake P. Miller
University of Montana - Missoula, Blake.Miller@mso.umt.edu

Instructor: Blake Miller
Office Hours: By Appointment
Email: blake1.miller@umontana.edu
Office: GH 07 (The Math Shack), Missoula College East Campus
Text: MyLabsPlus eText, or printable version available through The Bookstore

Chance favors the prepared mind.   --Louis Pasteur

Welcome to Probability and Linear Mathematics.

M115 is really two math courses in one. The first part of the course includes topics describing linear functions and their applications. We will examine phenomena that can be described as linear functions as well as common techniques for solving systems of linear equations. The second half of the course is an introduction to probability; probability provides important foundations for the study of statistics.

Placement in M115 is based on your individual mathematics assessment (ALEKS, ACT, COMPASS, or SAT) or completion of either M090 (Introductory Algebra) with a grade of RB- or better or M095 (Intermediate Algebra) with a grade of RC- or better. (The "R" designation indicates that the course is remedial or developmental.)
Be certain that you are enrolled in the proper math class at the beginning of the semester. You may not be able to switch into a more appropriate class after the first week. If you have any concerns about your placement see me immediately.

This course has been designed for you, the student. Your willing participation is essential if you plan to succeed in this course. Attendance is not part of your final grade, but no one can teach you if you are not in class engaged and ready to learn. Turn off your cell phone (and yes, that includes text messaging). Come to class and come prepared. Please understand that it is impossible for any instructor to cover every example in class. You need to do your part by reading the book on your own to the best of your ability. Don't fall behind. Pay attention and participate! You are an important part of this class — in fact, you ARE the class and have everything to do with how the class "feels."   You can make this class lively and interesting or you can make it silent and boring. If you keep up with the homework, you will find the material makes sense and the challenges are manageable.

Our classroom environment is based on mutual respect and appreciation. I will respect your efforts and appreciate your contributions, and you should do the same for me and your classmates. Support your classmates' efforts as well as your own and it will make our entire class stronger.

I cannot emphasize enough how important it is for you to be diligent in your study habits. You cannot learn math by wishful thinking alone; you need to put in the effort in order to be able to learn the material. Different students have different learning styles, but every student can improve with effort. Find the technique that works best for you.

ATTENDANCE: Attendance does not directly contribute to your grade in M115, but regular attendance can only strengthen your learning. You cannot expect to succeed in this course if you miss many classes; important information may be shared at any time that may not be posted on Course Compass.
University of Montana policy states:

Students who are registered for a course but do not attend the first two class meetings may be required by the instructor to drop the course. This rule allows for early identification of class vacancies to permit other students to add classes. **Students not allowed to remain must complete a drop form or drop the course on the internet (http://cyberbear.umt.edu) to avoid receiving a failing grade.** Students who know they will be absent should contact the instructor in advance.

Students are expected to attend all class meetings and complete all assignments for courses in which they are enrolled. Instructors may excuse brief and occasional absences for reasons of illness, injury, family emergency, or participation in a University sponsored activity. (University sponsored activities include for example, field trips, ASUM service, music or drama performances, and intercollegiate athletics.) Instructors shall excuse absences for reasons of military service or mandatory public service.

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

MYLABSPLUS (MLP): MyLabsPlus is an innovative way for you to do homework and take quizzes with immediate feedback; MyLabsPlus also keeps you on task and using your developing math skills. Every section of the M115 text covered in class has a corresponding assignment in MyLabsPlus; homework can be retaken as often as you wish until the unit closes. Review exercises at the end are optional but recommended.

There is a chapter quiz for each of the chapters covered in class as well; each quiz can be taken three times and the highest score is the recorded score. **Note** that these assignments and chapters are open for specific times and in a specific order. Check the MyLabsPlus calendar frequently and attend class to be sure you are keeping current with your assignments. You must keep up with the progression in order to succeed in this course. Late assignments and tests will not be reopened without a compelling reason. You may access your MyLabsPlus course shell through http://my.umt.edu by clicking the MyLabsPlus icon at the top of the page and using your NetID/Password.

CALCULATOR: A graphing calculator is required for M115; the Department of Applied Arts and Sciences uses and recommends Texas Instruments models TI-83 or TI-84. Calculators with symbolic manipulation capabilities (e.g., TI-89, TI-92) will not be allowed in testing situations.

IN-CLASS TESTS: Five tests will be given in class. Testing serves an important purpose; these tests are intended to give you an opportunity to share what you have learned, not to intimidate you. Graphing calculators removed from their cases are permitted, but may not be shared with other students during the exam. All scratch work must be done directly on the exam and returned to me when leaving the classroom. A single page (8½"x11") of notes (both sides) may be used to assist you during tests.

When circumstances prevent you from taking a test at the scheduled time, contact me PRIOR to the time of the test to announce your absence. Absences are excused only for reasons of illness, injury, family emergency, or a University-sponsored activity. Arrangements for a make-up exam must occur within a week of the scheduled exam date. Failure to arrange a make-up exam within a week of the scheduled exam date will result in a score of zero for the exam. At most one make-up exam will be given.Corrected tests will ordinarily be returned within one week after the test date. If you have questions regarding the grading of your test, please wait until after class to discuss it.

FINAL EXAM: The final exam for this class is comprehensive and is worth 150 points. Students who have earned an average of 90% or better on the MyLabs assignments prior to the final exam are exempt from taking the final and will be awarded a grade of "A" for the course.

LEARNING OUTCOMES:
Upon completion of this course, a student will be able to:
- Master basic concepts of lines, linear systems, matrices and linear programming (graphical method only).
- Understand basic probability concepts: probability models (Venn diagrams, two-way tables), sample spaces with equally likely outcomes (counting), conditional probability (tree diagrams), Bayes' theorem, binomial probabilities, probability distributions.
- Understand the rudiments of statistics: measures of center and spread, the normal distribution and the normal approximation to the binomial distribution.

- Use the above concepts to solve application problems (this includes learning to precisely formulate a problem and to interpret solutions).

ACADEMIC CONDUCT: All students must practice academic honesty as defined by the Student Conduct Code, available at http://www.umt.edu/vpsa/policies/student_conduct.php. Academic misconduct is subject to an academic penalty by the instructor and a disciplinary sanction by the university.

GRADING POLICIES: The following Table shows the values for each of the MyLabsPlus Components
The final grade for M115 will be computed as follows:

MyLabsPlus quizzes:	120 points (6 @ 20 points each)
MyLabsPlus homework:	96 points (24 @ 4 points each)
In-class tests:	500 points (5 @ 100 points each)
Final exam:	150 points
TOTAL	866 points

Letter grades correspond to numerical scores according to this plan:

RA	RB	RC	RD	RF
90-100%	80-89%	70-79%	60-69%	Below 60%

TUTORING: Math tutoring is available for all UM students. Check for hours at the Academic Support Center (ASC) at the Missoula College campus (AD 06; 243-7826; two days' notice required for scheduling tests) and at math@Mansfield on the Mountain Campus: http://cas.umt.edu/math/undergraduate/all-students/free-tutoring.php

REASONABLE ACCOMMODATIONS: Students with disabilities may request reasonable modifications. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). "Reasonable" means the University permits no fundamental alterations of academic standards or retroactive modifications. For more information, please consult http://www.umt.edu/dss/. Examples of reasonable accommodations include extra time or use of a quiet room for tests and/or quizzes. To qualify for reasonable accommodations you must provide a letter from DSS. You are responsible for making the necessary arrangements with DSS (for the Mountain Campus) or the ASC (for the Missoula College campus). If you have any questions, please contact me.

EXTRA CREDIT: There is no extra credit available for this course.

PETITION TO DROP: Petitions for dropping will be considered only for students who provide written verification of at least one university approved excuse:
1. Error in registration
2. Accident or illness
3. Family emergency
4. Change in work schedule

Reasons that are not satisfactory include:
1. Forgetting to turn in a drop slip
2. Protecting a student's grade point average

See Important Dates below for more information.

INCOMPLETES: A grade of incomplete will only be considered when all three of the following are true:
1. The student has been in regular attendance and passing up to three weeks before the end of the academic semester.
2. Factors beyond the student's control make it impossible to complete the course on time.
3. The instructor and the student agree that there is a reasonable probability that the student will be able to make-up the work required to complete the course and specific arrangements are drawn up and signed by both.

A student who receives an incomplete has one calendar year to resolve the incomplete (I) before it automatically reverts to a failing grade (F).

IMPORTANT DATES

Class Day 7:
 Last day for students to Add classes via CyberBear without consent.

Class Day 15:
✓ Last day to register for classes, add classes with override slip/electronic override, change credits in variable credit courses, or drop classes with a refund on CyberBear or with override slip/electronic override.
✓ Last day to withdraw from the semester (drop all courses) with a partial refund.
✓ Last day to change grading option to or from audit.
✓ Last day to Buy or Refuse health insurance coverage or add clinical health fee.

Class Day 16 – Class Day 45:
✓ Autumn Semester course changes require a drop/add form with Advisor and Instructor signatures.
✓ Students can add or drop courses or change grading options, except audit. $10 fees will be assessed per drop and per add.
✓ A 'W' will appear on the transcript.

Class Day 46 – Last Day of Classes:
✓ Autumn Semester course changes require a petition form available at Griz Central Registration Counter with Advisor, Instructor and Dean Signatures.
✓ Students can add or drop courses or change grading options, except audit. $10 fees will be assessed per drop and per add.
✓ A 'WP' or 'WF' will appear on the transcript.

Last Monday of Classes:
Last day to withdraw from the semester (Dropping all Autumn courses) by 5:00 p.m.

After the Last Monday of Classes:
If withdrawing from all Autumn Semester courses, a petition to retroactively withdraw will be required and students must obtain the appropriate signatures.

Important Dates and Deadlines is found at http://www.umt.edu/registrar/PDF/201570ImportantDatesDeadlines.pdf

OTHER INFORMATION:
Academic calendar available at   http://www.umt.edu/provost/about/academiccalendar.aspx
Finals schedule available at   http://umt.edu/registrar/students/finalsweek2/Autumn.aspx
Office for Student Success (math placement)
                                    http://www.umt.edu/oss/student_success_resources/mathplacement/default.aspx

Some other useful websites:
Khan Academy   http://www.khanacademy.org/
Purplemath.com   http://www.purplemath.com/
MathBits: Using TI calculator   http://mathbits.com/MathBits/TISection/Openpage.htm#General
Another great TI 83/84 help site http://www. prenhall. com/divisions/esm/app/graphing/ti83/
Calculator help for other models http://www. prenhall. com/divisions/esm/app/calc_v2/
Free graph paper generator   http://incompetech. com/graphpaper/
Coping with Math Anxiety   http://www.mathacademy.com/pr/minitext/anxiety/
Math.com Anxiety Study Tips   http://www.math.com/students/advice/anxiety.html

M115 SPRING 2016 COURSE OUTLINE:

Jan 25 Intro to M115	Jan 27 §1.1	Jan 29 §1.2
Feb 1 §1.3	Feb 3 §1.3	Feb 5 §2.2
Feb 8 §2.3	Feb 10 §2.3-2.4	Feb 12 §2.5
☺ Feb 15 ☺ Presidents' Day – No Classes	★ Feb 17 ★ Test 1 — Chapters 1 and 2	Feb 19 §3.1
Feb 22 §3.2	Feb 24 §3.3	Feb 26 §3.3
Feb 29 Review	★ Mar 2 ★ Test 2 — Chapter 3	Mar 4 §7.1
Mar 7 §7.2	Mar 9 §7.3	Mar 11 §7.3
Mar 14 §7.4	Mar 16 §7.4	Mar 18 §7.5
Mar 21 §7.6	Mar 23 Review	★ Mar 25 ★ Test 3 — Chapter 7
Mar 28 §8.1	Mar 30 §8.2	Apr 1 §8.3
Spring Break Apr 4 – Apr 8		
Apr 11 §8.4	Apr 13 §8.4	Apr 15 §8.5
Apr 18 Review	★ Apr 20 ★ Test 4 — Chapter 8	Apr 22 §9.1
Apr 25 §9.2	Apr 27 §9.3	Apr 29 §9.3
May 2 Review	★ May 4 ★ Test 5 – Chapter 9	May 6 Final Review
Final Exams Week May 9 - 13 The final exam for this class is scheduled for _____ in this classroom.		