1-2015

M 115.H1: Probability and Linear Mathematics - Hamilton

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                    Chance favors the prepared mind.   --Louis Pasteur

Welcome to Probability and Linear Mathematics!   M115 is really two math courses in one. The first half of the course is an introduction to probability; probability provides important foundations for the study of statistics. The second 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.

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 <u>*immediately*</u>.

        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 M095, 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.
>
> <u>Students are expected to attend all class meetings and complete all assignments for courses in which they are enrolled</u>. 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:

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. Uses of Percentages
6. Systems of Linear Equations and Matrices
7. Linear Programming, The Graphical Method (Graphing Linear Inequalities, Solving Linear Programming Problems Graphically, Applications)

COURSE OBJECTIVES:

Upon successful completion of the course, students will be able to perform each of the following:

1. Master basic concepts of lines, linear systems, matrices and linear programming (graphical method only).
2. 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.
3. Understand the rudiments of statistics: measures of center and spread, the normal distribution and the normal approximation to the binomial distribution.
4. Use the above concepts to solve application problems (this includes learning to precisely formulate a problem and to interpret solutions).

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 be returned 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.

ACADEMIC CONDUCT: All students are expected to practice academic honesty as defined by the Student Conduct Code, available at http://life.umt.edu/sa/documents/fromWeb/StudentConductCode1.pdf. Academic misconduct is subject to an academic penalty by the instructor and a disciplinary sanction by the university.

DROPPING AND ADDING COURSES OR CHANGING SECTIONS, GRADING OR CREDIT STATUS:
Students are expected, when selecting and registering for their courses, to make informed choices and to regard those choices as semester long commitments and obligations.

After registering and through the **first fifteen (15) instructional days of the semester**, students may use (http://cyberbear.umt.edu) to drop and add courses or change sections and credits.

Change of grading option to audit is not allowed after the 15 instructional day.

Beginning the sixteenth (16) instructional day of the semester through the forty-fifth (45) instructional day, students use paper forms to drop, add and make changes of section, grading option, or credit. The drop/add form must be signed by the instructor of the course and the student's advisor. The signed drop/add form must be returned to the Registration Counter (or the Registrar's Office at the College of Technology) no later than the **forty-fifth** instructional day.

Beginning the forty-sixth (46) instructional day of the semester through the last day of instruction before scheduled final examinations, students must petition to drop. The petition form must be signed by the instructor of the course and the student's advisor and, the dean of the student's major. The instructor assigns a grade of WP (withdrew/passing) if the student's course work has been passing or a WF (withdrew/failing) if the course work has been failing. These grades do not affect grade averages but they are recorded on students' transcripts.

Documented justification is required for dropping courses by petition. Some examples of documented circumstances that may merit approval are:

- Error in registration,
- Family emergency, or
- Accident or illness,
- Other circumstances beyond the student's control

Reasons that are not satisfactory include:

- Forgetting to turn in a drop slip
- Protecting a student's grade point average

The opportunity to drop a course for the current term ends on the last day of instruction before scheduled final exams. Dropping a course taken in a previous term or altering grading option or audit status for such a course is not allowed. The only exceptions are for students who have received a grade of NF (never attended).

WITHDRAWAL FROM THE UNIVERSITY:

Students who withdraw from the University while a semester is in progress must complete withdrawal forms which are obtained from the Registration Counter in Griz Central in the Lommasson Center or the Registrar's Office in the College of Technology. Drop/add forms cannot be used to withdraw from school and students are not allowed to drop all their courses on the internet. Medical withdrawals are granted only for a student's significant health problems and must be documented by a healthcare provider.

When withdrawal forms are completed in Griz Central or the Registrar's Office in the College of Technology before the last two weeks of the semester, a grade of W (withdrawal) is assigned. Beginning two weeks from the end of the term, students may not withdraw from the University except for very unusual circumstances.

INCOMPLETES: A grade of incomplete will only be considered when <u>all</u> <u>three</u> 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).

GRADING POLICIES: The final grade for M115 will be computed as follows:

MyMathLab quizzes:	120 points (6 @ 20 points each)
MyMathLab homework:	96 points (24 @ 4 points each)
In-class tests:	500 points (5 @ 100 points each)
Final exam:	<u>150 points</u>
TOTAL	896 points

IMPORTANT NOTE: If you are not taking this course as a general education requirement, you must take it for a traditional letter grade (not CR/NCR). A grade of D- is considered passing and will earn you credit for the course, BUT it will NOT fulfill your general education requirement and you will have to retake the class. A grade of **C or better** is needed to fulfill the math literacy requirement.

   Letter grades correspond to numerical scores according to this plan:

A	B	C	D	F
90-100%	80-89%	70-79%	60-69%	Below 60%

OTHER INFO:
Academic Support Center (COT): AD06, phone # 243-7826 (need 2 days' notice for make-up tests)
Math Learning Center (Math Bldg): Basement – used for taking make-up tests; and
math@Mansfield: Mansfield Library – drop-in tutoring center http://www.umt.edu/math/MLC/default.htm
DSS (Disability Services for Students): EL154, phone # 243-2243 http://life.umt.edu/dss/
Academic policies and procedures available at http://life.umt.edu/vpsa/documents/StudentConductCode1.pdf
Academic calendar available at http://www.umt.edu/provost/academiccalendar.html
Finals schedule available at http://www.umt.edu/Registrar/students/finalsweek2/autumn2010.aspx
Some useful websites: http://www.purplemath.com/
               http://algebasics.com/
               http://www.prenhall.com/divisions/esm/app/calc_v2/ (graphing calc help)
               http://incompetech.com/graphpaper/ (free graph paper generator)
               http://www.mathacademy.com/pr/minitext/anxiety/ Coping with Math Anxiety
               http://mtsu32.mtsu.edu:11064/anxiety.html Help for Math Anxiety

M115 Spring 2015 COURSE OUTLINE:

Jan 26 Intro to M115	Jan 28 §7.1	Jan 30 §7.2
Feb 2 §7.3	Feb 4 §7.3	Feb 6 §7.4
Feb 9 §7.4	Feb 11 §7.5	Feb 13 §7.6
☺ Feb 16 ☺ Presidents' Day Holiday	Feb 18 Review	★ Feb 20 ★ Test 1 – Chapter 7
Feb 23 §8.1	Feb 25 §8.2	Feb 27 §8.2
Mar 2 §8.3	Mar 4 §8.4	Mar 6 §8.5
Mar 9 Review	★ Mar 11 ★ Test 2 – Chapter 8	Mar 13 §9.1
Mar 15 §9.2	Mar 17 §9.3	Mar 21 §9.3
★ Mar 23 ★ §9.3	Mar 25 Review	★ Mar 27 ★ Test 3 – Chapter 9
☺ Mar 30 – Apr 3 ☺ Spring Break		
Apr 6 §1.1	Apr 8 §1.2	Apr 10 §1.3
Apr 13 §2.2	Apr 15 §2.3, 2.4	Apr 17 §2.5
Apr 20 Review	★ Apr 22 ★ Test 4 – Chapters 1 & 2	Apr 24 §3.1
Apr 27 §3.2	Apr 29 §3.3	May 1 §3.3
May 4 Review	★ May 6 ★ Test 5 – Chapter 3	May 8 Review
May 12 3:20 – 5:20 pm Final Exam		

Table of Contents