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Spring 1-2016

M 115.50C: Probability and Linear Mathematics

Josef S. Crepeau

University of Montana - Missoula, josef.crepeau@mso.umt.edu

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Recommended Citation

Crepeau, Josef S., "M 115.50C: Probability and Linear Mathematics" (2016). *University of Montana Course Syllabi*. 4064.

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Instructor: Josef S. Crepeau

Office Hours: By Appointment

Email: josef.crepeau@umontana.edu

Office: MLIB 115 (Basement of Mansfield Library)

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. You are an important part of this class — in fact, you ARE the class and have everything to do with how the class "feels". If you keep up with the homework, you will find the material makes sense and the challenges are manageable.

Our online 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.

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)

MYLABSPPLUS (MLP): All coursework for M115 Online will be done in MyLabsPlus. It is important to know that **MyLabsPlus is NOT Moodle**. 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.

To access your MyLabsPlus course shell go to <http://my.umt.edu> and click the MyLabsPlus icon at the top of the page. Use your NetID/Password to complete the login process.

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.

CHAPTER TESTS: There are five chapter tests that are taken through MyLabsPlus. 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 are permitted as well as a single page (8½"x11") of notes (both sides) to assist you during tests.

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. The final exam will be delivered through MyLabsPlus.

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:	<u>150 points</u>
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 Spring 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>