Spring 2-1-2017

M 115.10: Probability and Linear Mathematics

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Contact Professor:

✓ Lecturer: Lauren Fern  
✓ Office: Math 205B  
✓ Phone: 243.5398  
✓ Email: fernl@mso.umt.edu  
✓ Math Webpage: http://hs.umt.edu/math/courses/with-webpages/M115.php  
✓ Tutoring: Free tutoring is available at the tutorial center at Math@Mansfield, located in the Mansfield Library Main Floor next to the Copy Center. Hours will be posted on the website and announced once they have been determined.

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 ≥19, or ALEKS placement ≥ 3, or ACT score of 22, or SAT score of 550(with the new test). Systems of linear equations and matrix, 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. Use linear equations, systems of linear equations and linear programming (graphical method only).
2. 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.
3. Use probability distributions: the binomial and normal distributions, and the normal approximation to the binomial distribution.
5. 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

Text:

Finite Mathematics-11th Custom Edition, Tan. A graphing calculator is also required. Classroom demonstrations will be done with a TI-83 Plus. A graphing calculator with symbolic capability, such as a TI-89, TI-92 or anything CAS will not be allowed on quizzes or exams.

In order to use the online homework and other helpful features on WebAssign (which came packaged with your text):

Instructor: Lauren Fern  
Section: M115, section 10  
Class Key: umontana 1122 0707

To register/login to your webassign account visit: http://webassign.net/login.html

Grading:
Your course grade will be based on 3 exams, 100 points each, for a total of 300 points. There will be ten quizzes of 10 points each, with the lowest two dropped. The quiz total will be 150 points (it will be scaled up). There are no make-up quizzes. This semester you will also have the option of doing online homework, which may count towards 50% of the quiz grade. In other words, you can do the online homework assigned, and that will count for 75 points of your “quiz” grade, while the quizzes count for the other 75 points. If, on the other hand, you prefer to do the online portion for practice, when needed, but not for a grade, you may have the quizzes count for all of the 150 points. If at the end of the semester your online homework average is higher than your quiz average, we will count the online homework for half of the quiz grade (as mentioned above). If, on the other hand, your online homework average is lower than your quiz average, we will use the quizzes for all of the 150 points and the online homework will have no effect on your grade whatsoever. In other words, we will choose the option that is most beneficial to your grade. There will be a 150 point cumulative final exam. All the tests and quizzes are closed book, but calculators are allowed on all tests and quizzes. When a test is returned, there is one week from the date of return for contesting the grading. After that time period the grade will be accepted as final. In sum, your three in class exams will count toward 50% of your grade; the lab portion (quizzes and homework) will count toward 25% of your grade; and the cumulative final will count 25% of your grade.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grading Scale by Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90%+</td>
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<tr>
<td>B</td>
<td>89-80%</td>
</tr>
<tr>
<td>C</td>
<td>79-65%</td>
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<tr>
<td>D</td>
<td>64-55%</td>
</tr>
<tr>
<td>F</td>
<td>Less than 55%</td>
</tr>
<tr>
<td>CR</td>
<td>≥ 55%</td>
</tr>
</tbody>
</table>

*** 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 turn-in assignments and quizzes, regardless of the reason (e.g. sickness, sports, family emergency, etc.); this is why the lowest two are dropped. Exam make-ups will ONLY be given under special and extenuating circumstances, such as a death in the family or illness, provided that a note from the Health Service or doctor is furnished by the student AND permission is given by me prior to the exam. At most one make-up exam will be given. 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.

Add/Drop Policy:
The last day to add/drop or change grading option to Audit by Cyberbear is 2/10. The last day to change sections and to change grading options is 4/3. This is also the last day to drop. Changes after this deadline and until 5/5 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 2016-2017 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. Available for review online at http://www.umt.edu/SA/VPSA/index.cfm/page/1321

Disability modifications:
The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. 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 Services to provide an appropriate modification.

Important University-Wide Info and Dates:
- Monday, 20 February: President's Day. No school.

The following syllabus is subject to modifications (and in all probability will be changed due to timing!). This includes a potential change of dates for test 1, test 2, or test 3.

<table>
<thead>
<tr>
<th>Week</th>
<th>Sections</th>
<th>Quiz and Exam Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/23 – 1/27</td>
<td>6.1, 6.2, 6.3</td>
<td></td>
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<tr>
<td>1/30 – 2/3</td>
<td>6.3, 6.4</td>
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<tr>
<td>2/6 – 2/10</td>
<td>7.1, 7.2, 7.3</td>
<td>Quiz 2</td>
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<tr>
<td>2/13 – 2/17</td>
<td>7.3, 7.4, 7.5</td>
<td>Quiz 3</td>
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<tr>
<td>2/20 – 2/24</td>
<td>7.5, Review, Test 1</td>
<td>Test 1: Friday 24 Feb.</td>
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<tr>
<td>2/27 – 3/3</td>
<td>7.5, 7.6, 8.1</td>
<td>Quiz 4</td>
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<tr>
<td>3/6 – 3/10</td>
<td>8.2, 8.3</td>
<td>Quiz 5</td>
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<tr>
<td>3/13 – 3/17</td>
<td>8.3, 8.4, 8.5</td>
<td>Quiz 6</td>
</tr>
<tr>
<td>3/20 – 3/24</td>
<td><strong>SPRING BREAK!!</strong></td>
<td></td>
</tr>
<tr>
<td>3/27 – 3/31</td>
<td>8.6, Review</td>
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<tr>
<td>4/3 – 4/7</td>
<td>Test 2, 1.1, 1.2</td>
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</tr>
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<td>4/10 – 4/14</td>
<td>1.3, 1.4, 1.5</td>
<td>Quiz 8</td>
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<td>1.5, 2.1-2.6</td>
<td>Quiz 9</td>
</tr>
<tr>
<td>4/24 – 4/28</td>
<td>2.2-2.6, Review, Test 3</td>
<td>Test 3: Friday 28 April</td>
</tr>
<tr>
<td>5/1 – 5/5</td>
<td>3.1 – 3.3</td>
<td>Quiz 10 take-home</td>
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**Thursday May 11** | *Final Exam* | 3:20 – 5:20