

Math 234-01 Higher Mathematics for Elementary School Teachers
TU 9:40-11:00 Section 03 CRN 37837

Semester: Spring 2018
Location: LA 235

Instructor: Richard Darnell, Office Math 002
Office hours T 11:30-2, W 10:30-1, Th 11:30-1:30, and by appointment.
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Course coordinator: Bonnie.Spence@umontana.edu, Math 004A, 243-4808

Course Description: The study of algebra, number theory, probability and statistics for prospective elementary and middle school teachers, including proportional reasoning, functions, elementary number theory, statistical modeling and inference, and elementary probability theory.

Prerequisites: M 132

Course Materials: Required Textbook, *Sybilla Beckmann: Mathematics for Elementary Teachers with Activities Plus NEW Skills. 4th edition.* (Pearson, 2014).
ISBN 9780321825728

Notebook of choice, pencil/ pen, calculator

Learning Outcomes: Upon completion of this course, a student will be able to:

1. Apply algebra in many forms (e.g., as a symbolic language, as generalized arithmetic, as a study of functions, relations, and variation) and use algebra to model physical situations and solve problems;
2. Explain proportionality and its invariant properties;
3. Apply number theory concepts and theorems, including greatest common factors, least common divisor, properties of prime and composite numbers, and tests for divisibility;
4. Represent, analyze and interpret data;
5. Simulate random events and describe expected features of random variation;
6. Distinguish between theoretical and experimental probability and describe how to use one or both to determine a probability in a given situation.

Classwork: Class activities are a mix of individual, partner, group and all-class participation. Activities with manipulatives and related discussions are difficult to replicate in the case of an absence from class. Deeper learning occurs when students are in attendance to share their explanations and methods of solving problems with each other. Please attend regularly.

Vertical Learning Activities will occur every week (at least once, sometimes twice) typically on Tuesdays. You must be in attendance and complete a reflection to earn credit.

Homework: Homework is a mixture of textbook exercises, Moodle assignments, problems, and preparation for future classes. Homework will be graded for thoughtful completion. Minimal feedback will be provided – more detailed feedback may be obtained during office hours.

Assessments: Assessments will be given every 2-3 weeks, typically on Thursdays. They will consist of 3 to 7 questions on the current topics of study.

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 obtained from the instructor prior to the exam. The final exam is compulsory and no exceptions can be made about the date/time at which it is held- this date is determined by the University Administration.

Grading Policy: Your grade will be based in four areas: Participation in homework and group activities, and performance on assessments and the final exam. For each grade band (A, B, C, D) **at least 3 of the criteria must be met to earn that grade.**

| Letter Grade | Homework | Group Activity | Assessments | Final |
|--------------|--------------------------------------|--|--------------------|------------------|
| A | 95% or more of assignments completed | No more than 1 activity day absence/missing reflection | Average \geq 85% | Score \geq 85% |
| B | 90% or more of assignments completed | No more than 2 activity day absences/missing reflections | Average \geq 75% | Score \geq 75% |
| C | 85% or more of assignments completed | No more than 3 activity day absences/missing reflections | Average \geq 65% | Score \geq 65% |
| D | 75% or more of assignments completed | No more than 4 activity day absences/missing reflections | Average \geq 60% | Score \geq 60% |
| F | Two or more criteria below a D-level | | | |

Your grade may move up or down to +/- grades or a different grade altogether based on criteria that don't meet a grand band criteria.

Moving down: For the fourth criteria, your grade will move down one "half-step" (A to A-, B- to C+, etc) for each level the criteria is below.

Moving up: You can move up one "half-step" if one or two of your criteria are above the current grade band.

Example 1: You completed 92% of assignments, missed two activity days, and had an assessment score average of 70%, and earned an 83% on the final exam. Three criteria are met for a B, with one criteria in the C range. Your grade is a B-.

Example 2: You completed 86% of assignments, had an assessment average of 68%, and your final score was 70%. However, you missed 5 activity days. The missed criteria are two levels below C, so your grade is a D+.

Example 3: You complete 92% of assignments, missed two activity days, and have an assessment score average of 96% and earned an 80% on the final exam. Three criteria are met for a B, with one criteria in the A range. Your grade is a B+.

Passing: To earn a C- or better, you must have at least three criteria in the C category, with the remaining no lower than a D level. You may change to Credit/No Credit up to the last day of the class. General credit will be awarded to students earning a D- or better. However, if you choose this option the grade cannot be counted towards the School of Ed requirement nor the UM graduation requirement.

Support: Math support can be obtained by attending the Math Learning Center in the Math Building and Math@Mansfield, visiting your instructor's office hours, and by working on homework or studying with classmates. Do not wait until the week of exams to get help. Ask questions regularly both in class and out of class.

Feel free to use additional resources (and share anything worthwhile with the class), including web sites, YouTube videos, etc.

Accommodation: The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors and Disability Services for Students (DSS). If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate accommodation.

Academic Honesty: 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. The Code is available for review online at the following web address:
http://life.umt.edu/vpsa/student_conduct.php.

M234 Fall 2017 Schedule

| Week | Chapter | Notes |
|--|--|--|
| 1 | Chapter 8 Number Theory | |
| 2 | Chapter 8 Number Theory | |
| 3 | Chapter 8 Number Theory | Thursday Assessment Number Theory |
| 4 | Chapter 7 Ratio & Proportion | |
| 5 | Chapter 7 Ratio & Proportion | Thursday Assessment Ratio and Proportion |
| 6 | Chapter 7 Ratio & Proportion | |
| 7 | Chapter 9 Algebra | Thursday Assessment Ratio and Proportion |
| 8 | Chapter 9 Algebra | |
| 9 | Chapter 9 Algebra | Wednesday Assessment Algebra |
| 10 | Wrap Up Chapter 9 Algebra Begin Chapter 15 Statistics | |
| 11 | Chapter 15 Statistics | |
| 12 | Chapter 15 Statistics | Thursday Assessment Statistics |
| 13 | Chapter 15, 16 Probability | |
| 14 | Chapter 16 Probability | |
| 15 | Review and Evaluation | Tuesday Assessment Probability Thursday and Evaluation Review Day |
| May 8: Final Exam 8-10-3:10 p.m. on course learning goals in LA 235 | | |

*Acceptable reasons for a late drop are listed in the university catalog and include reasons such as accident, illness, family emergency or a change in work schedule. The following examples are not considered sufficient for a late drop: protecting GPA, forgetting to turn in the change slip, losing financial aid, losing eligibility to engage in sports.