

# Casper College Course Syllabus

**Course:** Math 1105-01: Data Probability and Algebra for Elementary School Teachers

**Semester:** Spring 2014

**Lecture Hours:** 3

**Lab Hours:** 0

**Credit Hours:** 3

**Class Time:** 12:00-12:50 MTTH

**Room:** PS 216

**Instructor:** Kendall Jacobs

**Office:** PS 338

**Office Phone:** 268-2043

**Email:** kjacobs@caspercollege.edu

## **Office Hours:**

TTH 8:00-8:50    TTH 11:00-11:50    MWF 1:00-1:50

**If the above times don't work for you, please make an appointment or just drop by!**

**Course Description:** This course is a continuation of Math 1100 and is for prospective elementary school teachers. Its primary emphasis is to train students to ask and answer questions intelligently about our world through the use of algebra, probability and data analysis in order to prepare these students to be competent in teaching these major concepts. Projects focus on representing, analyzing, formalizing and communicating patterns and the chances of future events.

**Prerequisites:** : A grade of "C" or better in MATH 1100 within the past year.

## **Goal:**

The Conference Board of the Mathematical Sciences recommended that "Prospective teachers need mathematics course that develop deep understanding of the mathematics they will teach. . . and most of all, [they] need to learn how to learn mathematics."

Consequently, the purpose of this course is to provide prospective elementary school teachers with a deeper understanding and mastery of the mathematical skills, concepts, processes, theories, and applications pertaining to rational numbers, algebra, probability, and statistics. This foundation will help future teachers to make appropriate "mathematical and pedagogical decisions" pertaining to the teaching of mathematics at the elementary level. The main focus of the course is on content and not pedagogy.

## **Outcomes**

Students who successfully complete this course will:

1. Develop skills in subject areas listed in the general objectives.
2. Learn to work abstractly with mathematical symbols and functions.
3. Develop oral and written communication skills in Mathematics.
4. Develop problem solving skills.
5. Develop confidence in their ability to use mathematics.

## Course Objectives

- Explore and analyze patterns, relations and functions.
- Recognize and analyze mathematical structures, i.e. properties of number systems.
- Use mathematical models to represent quantitative relationships.
- Develop skills in using algebraic notation to represent calculations, express identities and solve problems.
- Demonstrate knowledge of the historical development of algebra including contributions from diverse cultures.
- Design investigations that can be addressed by creating data sets and collecting organizing and displaying relevant data.
- Understand variability in data and some of the issues that arise in sampling. Use appropriate statistical methods, representations, graphical displays and technological tools to analyze data, describe shape, spread and center and compare two or more data sets.
- Make judgments under conditions of uncertainty, measure likelihood, become familiar with randomness and understand the relationship between experimental and theoretical results.
- Demonstrate knowledge of the historical development of probability and statistics including contributions from diverse cultures.
- Solve problems using critical thinking and creativity
- Use quantitative analytical skills to evaluate and process numerical data

## Materials Needed:

**Text:** *A Problem Solving Approach to Mathematics for Elementary School Teachers 11<sup>th</sup> Edition* by Billstein – Libeskind - Lott. Course Compass Access is required - <http://www.coursecompass.com>

**Internet:** You will be required to have access to the Internet. You may access the Internet via the Casper College Computer Labs.

**Methodology:** Class time will be a mixture of lecture, discussion, and group activities. You will be expected to OWN everything taught in class (whether or not you are present). I recommend that you study with the intent to understand and not just to get by on the exam - think about how you will explain the concepts we are studying when you are "the teacher." You will be strongly encouraged to participate in class. I hope you ask LOTS of questions. Besides contributing to lectures and class discussions, you will be asked to participate in group activities and complete several peer teaching assignments. Proficiency in mathematics requires practice! Consequently, homework will be assigned. The purpose of homework is NOT just to complete the assignment - it is to learn the material – students will present an occasional homework problem to the class.

**Role of the instructor:** There will be less "lecturing" in class than usual, with many questions "answered" by another question to help you work through your own questions and difficulties. You are expected to learn problem solving through active involvement - reading, writing, and explaining to others what you are thinking and doing. This may require some adjustment in the way you think about teaching and learning. Initially, you may wish for more direct information and answers, but your patience and effort will be rewarded with a deeper understanding and increasing independence in problem solving, as well as confidence in your ability to tackle new problems.

**Evaluation Criteria:** Your letter grade will be based on your performance (not effort) on the following tasks:

**Exams (approx. 60%):** Three 100-point and a comprehensive final will be required. Some of the exams may have an “oral” component. You are required to take exams at the scheduled hours. Under some pre-approved circumstances an exam may be taken early. In the event that an exam is missed, a 200-point cumulative final may be required. All exams and quizzes are cumulative.

**HW/Quiz/Explorations/Math Notebook (approx. 20%)** “The only way to learn mathematics is to do mathematics” (Paul Halmos). Learning Quizzes will be assigned on My Math Lab. You will also be required to keep a Math Notebook and submit written and/or videotaped explanations for various explorations. I am not only looking for correct solutions, but more importantly quality explanations of your thinking and insight into each problem solving activity. The “how” and “why” you solved a given problem is very important.

**Problem Solving – Class Engagement - Classroom work (approx. 10%):** This is more than just class attendance. You will be expected to be fully engaged in problem solving during class – among other things, this means asking questions, making conjectures, exploring the mathematics and working together. There is almost a century of research showing that academic achievement, productivity, and self-esteem improve dramatically when students work together in groups. You should not be texting, visiting, or daydreaming. Some in class exercises (ICE) will be graded. If you’re not there, you cannot participate. You will also be scored on some of the informal presentations you do in class.

**Service Learning (approx 10%)** You will be required to spend at least 6 hrs participating in approved service learning activities as it relates to STEM activities. I will give you several opportunities for this including the 4<sup>th</sup> grade day at Casper College, Library Day, Robotics Scrimmage, Wyoming Lego Robotics Tournament, and possibly helping some schools with Robotics and afterschool math and science programs.

**Absent/Late work Policy:** Students are expected to attend all class sessions and submit work when it is due. In general, I will not accept late work. I have found that when I accept late assignments students usually fall behind – this is a sure predictor of non-success in the class. If you are absent for one week or more due to accident, illness, etc., contact the dean of students and explain your reason. In these cases I can make arrangements with you to make up assignments.

**Grading Scale:** You are guaranteed a traditional grading scale of 90%+ A, 80-89% B, 70-79% C, 60-69% D, 59%- F. But I reserve the right to lower this without notice if I deem it necessary.

### **Student Rights and Responsibilities:**

Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

*Chain of Command:* If you have any problems with this class, you should first contact the instructor in order to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take your problem through the appropriate chain of command starting with the department head, then the division chair, and lastly the vice president for academic affairs.

*Academic Dishonesty - Cheating & Plagiarism:* Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct.

*ADA Accommodations Policy:* It is the policy of Casper College to provide appropriate accommodations to any student with a documented disability. If you have a need for accommodation in this course, please make an appointment to see me at your earliest convenience. If you need ADA accommodation you may contact Brent Heuer, Accommodative Services Counselor 307-268-2557

**Course Content:** See attached schedule:

**Last Day to Change to Audit or Withdraw:** November 12, 2015 will be the LAST day to drop this class. If you are thinking about changing your course status, please see me BEFORE this date. You will not be allowed to audit unless you have been attending class on a regular basis.

**Official Means of Communication:** Casper College faculty and staff will employ the student's assigned Casper College email account as a primary method of communication. Students are responsible to check their account regularly.

**Help:** I recommend you keep up with the class. If you need help, then get it . . . FAST! I will be available to help individuals during my office hours or by appointment. **I want you to succeed!** The Math Lab (PS 104) is also a great place to go for assistance.

**IF YOU ARE HAVING TROUBLE IN THIS CLASS, PLEASE SEE  
ME  
AS SOON AS POSSIBLE!!!  
Let's have a GREAT semester!**

# Math 1105

## Data Probability and Algebra for Elementary School Teachers

### TENTATIVE SCHEDULE Fall 2015

WEEK	TOPICS
WEEK ONE Aug 24-28	Course Introduction 7.1-7.3 Decimals
WEEK TWO Aug 31-Sept 4	7.1-7.3 Operations on Decimals
WEEK THREE Sept 7 – Sept 11	7.4 Percent and Interest <b>Sept 7 Labor Day – No Class</b>
WEEK FOUR Sept 14-Sept 18	8.1-8.2 Numbers and Variables
WEEK FIVE Sept 21-Sept 25	8.3-8.4 Equations and Functions <b>Exam 1</b>
WEEK SIX Sept 28-Oct 1	8.5 Coordinate Systems and Modeling
WEEK SEVEN Oct 5 – Oct 9	8.1-8.5 Algebraic Thinking
WEEK EIGHT Oct 12-Oct 16	9.1 Introduction to Probability
WEEK NINE Oct 19-Oct 23	9.2-9.3 Multistage Experiments – Geometric Probabilities
WEEK TEN Oct 26-Oct 30	9.3 -9.4 Probability Simulation – Expected Value <b>Exam 2</b>
WEEK ELEVEN Nov 2-Nov 6	9.5 Permutations – Combinations <b>Nov 6 – Advising Day</b>
WEEK TWELVE Nov 9 – Nov 13	10.1-10.2 Descriptive Statistics <b>Nov 12- Withdrawal Deadline</b>
WEEK THIRTEEN Nov 16-Nov 20	10.3-10.4 Displaying Data – Measures of Central Tendency
WEEK FOURTEEN Nov 23-Nov 26	10.5 Intro to Inferential Statistics <b>Nov 25 – 27 Thanksgiving Holiday – No Class</b>
WEEK FIFTEEN Nov 30-Dec 4	10.5 Inferential Statistics <b>Exam 3</b>
WEEK SIXTEEN Dec 7 – Dec 10	Course Overview – Oral Assessment
Dec 14-Dec 18	<b>Finals Week: Comprehensive Final Exam TBA</b>