

DEPARTMENT OF MATHEMATICS

STRUCTURE AND CONCEPTS IN MATHEMATICS II – MATH 10B

Course Description:

This course is designed for prospective elementary school teachers. The focus of the course is the development of counting methods, elementary probability, statistics, and topics in geometry which include: polygons, congruence and similarity, measurement, geometric transformations, coordinate geometry, and connections between numbers and geometry with selected applications. A positive attitude towards mathematics brings confidence and an increased willingness to learn the mathematical content, skills, and effective teaching techniques necessary to become a competent mathematics teacher. The principal goals of this course are the following:

- to impart a positive attitude to prospective elementary and middle school teachers;
- to develop mathematical knowledge and skills;
- to develop students to become competent mathematics teaching professionals.

Prerequisite: Math 10A.

Instructor: Dr. Lance Burger
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Office Telephone: 278-4906
Office Hours: Wednesdays 9:00A-12:00P; 2:00P-4:00P or by appt.
Course Days, Time, & Location: TTH; 8:00A-9:15A; S2 207

Text: Billstein, Libeskind, and Lott (2004). *A problem Solving Approach to Mathematics for Elementary School Teachers* (9th Ed.). Addison Wesley.

Primary Content Learning Outcomes:

These learning outcomes are aligned with the content specifications in the subject area assigned. At the completion of the course student will be able to:

1. Demonstrate the ability to use technology for complex calculations, drawings, mathematical writings, communication, and searches.
2. Represent, investigate, and explain patterns, including relations and functions, through tables, graphs, verbal rules, or symbolic rules.
3. Demonstrate the ability of solving a wide variety of problems required by the California Content Standards in grades 1-7.
4. Gain familiarity with problem types of mathematics questions on required CBEST and CSET tests for elementary teachers.
5. Use concrete representations, such as manipulatives, models, and drawings for investigating and explaining mathematical concepts and patterns.
6. Demonstrate the ability to interpret assessment results, including standardized test scores.

Primary Skills and Abilities Learning Outcomes:

These learning outcomes are aligned with the content specifications in the subject area assigned. In Math 10A students will begin to develop these skills and abilities and these will be the main focus in Math 100. At the completion of the course student will be able to:

1. Identify and prioritize relevant and missing information in mathematical problems.
 2. Analyze complex problems to identify similar simple problems that might suggest solution strategies.
 3. Represent a problem in alternate ways, such as words, symbols, concrete models, and diagrams, to gain greater insight.
 4. Consider examples and patterns as means to formulating a conjecture.
 5. Apply logical reasoning and techniques from arithmetic, and algebra.
 6. Analyze problems to identify alternative solution strategies.
 7. Evaluate the truth of mathematical statements.
 8. Apply different solution strategies (e.g., estimation) to check the reasonableness of a solution.
 9. Demonstrate that a solution is correct.
 10. Explain their mathematical reasoning through a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and concrete models.
 11. Use appropriate mathematical notation with clear and accurate language.
 12. Explain how to derive a result based on previously developed ideas, and explain how a result is related to other ideas.
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ASSIGNMENTS AND EXAMINATIONS:

Homework: *Suggested homework* will be assigned almost every class meeting. The suggested homework serves as the fundamental study guide for the exams. It is imperative to understand the homework and ask questions in the beginning of class or office hours if you are not clear about it. Homework is not to be turned in unless announced as a *group project assignment*.

Group Projects: There will be several group projects to complete during the semester which may include specifically announced *homework assignments* (see above). Projects will collectively be worth **10%** of your final grade and must be individually written-up and turned in. Late project assignments will not be accepted without a documented excuse.

Quizzes: You will have five (5) quizzes during the semester. Each quiz will be worth **5%** of the final grade, for a total of **25%**. You will be asked questions related to previously assigned homework.

Exams: There will be two (2) MIDTERM EXAMS worth **40%** of the final grade, and a COMPREHENSIVE FINAL EXAM worth **25%** of the final grade. The exams cover homework-like problems, information presented in class, and information from readings and activities.

GRADING SCALE: A: 90 - 100%; B: 80 - 89%; C: 70 - 79%; D: 60 - 69%; F: 0-59%.

RE-SCHEDULING OR MAKE-UP OF QUIZZES AND EXAMS ONLY AVAILABLE WITH DOCTOR'S NOTE OR UNIVERSITY ATHLETIC ACTIVITY DOCUMENTATION – NO EXCEPTIONS!

MATH 10B COURSE OUTLINE (w/ suggested homework)

Date	Topic
Jan. 22	Probability I. Hmk.7-1: p. 444; #'s 3, 5, 8.
Jan. 27	Probability II; Hmk.7-1: pp. 444-446, #'s 10, 15, 23, 24.
Jan. 29	Multi-stage experiments, tree diagrams; Geometric probabilities I. Hmk.7-2: p. 462; #'s 3, 6, 7, 14
Feb. 3	Multi-stage experiments; tree diagrams; Geometric probabilities II. Hmk.7-2: p. 463-464; #'s 18, *21, 22, 28.
Feb. 5	Odds; Conditional Probability; Expected Value. Hmk.7-4: p. 483, #'s 5, 6, 7, 9, 13, 14, 15, 17, 20, 21. QUIZ 1
Feb.10	Permutations and Combinations; Hmk.7-5: pp. 493-494, #'s 2, 6, 8, 9, 12, 15, 23, 27.
Feb.12	Statistical Graphs; Hmk.8-1: pp. 517-518, #'s 2, 4, 14, 18, 21, 28.
Feb. 17	Measures of Central Tendency; Variation. Hmk.8-2: pp. 545-548, #'s 1, 4, 6, 11, 13, 14, 17, 18, 22, 23, 25, 27, 28, 40, 45.
Feb.19	REVIEW QUIZ 2
Feb.24	MIDTERM 1
Feb.26	Angles; Hmk.9-3: pp. 610-612, #'s 8, 10, 14, 23, 28.
Mar.3	Geometric Constructions I. Hmk.10-1: pp.658-659, #'s 4, 7. *In-class Construction Project
Mar.5	Geometric Constructions II; Hmk.10-2: pp.666-669, #'s 5, 14, 28, 40, 42.
Mar.10	Similarity; pp. Hmk.10-4: pp.691-693, #'s 8, 9, 19, 25, 27.
Mar.12	Similarity and Trigonometric Ratios; Hmk.10-5: p.706, #'s 1, 4, 7, 8, 9, 16.
Mar.17	Lines I; Hmk. 10-6: pp.725-726, #'s 2, 5, 6. QUIZ 3
Mar.19	Lines II; Hmk. 10-6: pp.726-727, #'s 10, 16, 22.
Mar.24	Lines III; Hmk.10-6: pp. 727, #'s 23, 25, 26. *In-class System of Eq. Project
Mar.26	REVIEW QUIZ 4
Mar.31	<i>Cesar Chavez Day-No class</i>
April 2	MIDTERM 2

April 7, 9	SPRING BREAK/ No class	
April 14	Perimeter, Circles, Arc length; Hmk.11-1: pp.747-749, #'s 3, 19, 23, 26, 27, 31.	
April 16	Area I; Hmk.11-2: pp.764-765, #'s 7, 9, 16, 21.	
April 21	Area II; Hmk.11-2: p.766, #'s 22, 28, 29, 36.	
April 23	Pythagorean Theorem; Hmk.11-3: pp.781-783, #'s 2, 9, 11, 15, 17, 29, 30.	
April 28	Distance Formula; Hmk.11-3: p.784, #'s 36, 39, 40.	
April 30	Surface Area I; Hmk.11-4: p.793, #'s 1, 5, 6, 10.	
May 5	Surface Area II; Hmk.11-4: pp.794-797 #'s 11, 21, 23, 24, 25, 26, 41.	
May 7	Volume; Hmk.11-5: pp. 816-818, #'s 5, 10, 12, 14, 22, 24, 26, 37.	
May 12	REVIEW	QUIZ 5
May 14,15	FACTULY CONSULTATION DAYS HOURS TBA	
May 21	FINAL EXAM is Thursday; 8:45A-10:45A in S2 207	

Subject to Change: This syllabus is subject to change in the event of extenuating circumstances.

ACADEMIC INTEGRITY HONOR CODE

California State University, Fresno is committed to maintaining a culture of academic integrity where all members are expected to adhere to fundamental values in both academic and non-academic endeavors. For purposes of this code, academic integrity is defined as “a commitment, even in the face of adversity, to five fundamental values: honesty, trust, fairness, respect, and responsibility. From these values flow principles of behavior that enable academic communities to translate ideals to action” (Center for Academic Integrity, *Fundamental Values of Academic Integrity*. <http://academicintegrity.org/fundamental.asp>, accessed January, 2005).

The Code

Members of the CSU Fresno academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities.

Principles of Implementation

- a. All members of the university community are responsible for adhering to high standards of academic integrity, for actively ensuring that others uphold the Code, and for responding assertively to violations.
- b. Faculty members are responsible for informing students of academic behaviors that are permissible and not permissible, and for reporting violations of the code to the proper campus authorities.
- c. Students shall not give or receive unauthorized aid on examinations or other course work that is to be used by the instructor as the basis of grading.

Responsibilities of CSU Fresno Administration

The CSU Fresno administration will:

- a. Exhibit high standards of professional ethics.
- b. Incorporate ‘orientation/training’ about the university’s expectations for student academic integrity into “Dog Days”, University 1, English 1, History 11 and 12, Political Science 2, and all special group orientations (e.g., EOP, Summer Bridge, AMP, ISSP, SCOP, HCOP, student-athletes, Smittcamp Family Honors College, McNair, etc.).
- c. Provide training on academic integrity expectations and implementation procedures to all levels of academic personnel (i.e., faculty, department chairs, deans, administrators and staff) through:
 - i. orientations for
 - ii. academic policies and procedures, TLT workshops and other faculty development programs
- d. Distribute the Honor Code and related policies widely through office posting and distribution, Internet web sites (including my.csufresno.edu) and university publications and programs.
- e. Support the Office of Student Judicial Affairs in the implementation of academic integrity policies.

Responsibilities of CSU Fresno Faculty

CSU Fresno academic faculty will:

- a. Exhibit high standards of professional ethics.
- b. Treat all students fairly and consistently to avoid any appearance of special favors for special groups.

- c. Explain what constitutes cheating, plagiarism, inappropriate collaboration or other issues related to academic integrity through the class syllabus, and in relation to assignments, tests and other class activities for which grades are to be assigned. Provide links to university web sites that explain and elaborate these policies.
- d. Give examples of cheating and plagiarism for the particular class and provide examples of past consequences to students for such behavior.
- e. Regularly update tests, assignments and notes.
 - f. Uphold university policy to report all instances of cheating, plagiarism and inappropriate academic behavior to the Office of the Vice-President for Student Affairs /Dean of Students.
 - g. Establish a 'culture of academic integrity' in individual classes and in each department.
 - h. Monitor students during tests and develop procedures for assessing whether assigned work has been completed in accordance with expectations.
 - j. Develop expectations for student self-monitoring and collective monitoring during examinations and on assignments by having students include and sign the following statement on all work to be used as the basis for a grade: "I have done my own work and have neither given nor received unauthorized assistance on this work."

Responsibilities of CSU Fresno Students

CSU Fresno students will:

- a. Understand or seek clarification about expectations for academic integrity (including no cheating, plagiarism and inappropriate collaboration) as noted by faculty and on class syllabi, university catalogue, university web sites and other referenced sources.
- b. Sign a statement at the end of all exams and assignments that "I have done my own work and have neither given nor received unauthorized assistance on this work."
 - c. Take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

Other University Policies:

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in Madden Library 1049 (278-2811).

Cheating and Plagiarism: "Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the [Class Schedule](#) (Policy/Legal Statements) or the [University Catalog](#) (University policies).

Computers: "At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Disruptive Classroom Behavior: "The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained... Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop and understanding of the community in which they live . . . Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

In particular, the use in class of cell phones, I-pods, etc. is prohibited.

Copyright policy: Copyright laws and fair use policies protect the rights of those who have produced the material. The copy in this course has been provided for private study, scholarship, or research. Other uses may require permission from the copyright holder. The user of this work is responsible for adhering to copyright law of the U.S. (Title 17, U.S. Code). To help you familiarize yourself with copyright and fair use policies, the University encourages you to visit its [copyright web page](#).
