Course Number/Title/Credits: MATU 207: Mathematics for Elementary School Teachers II

Catalog Course Description: This course is the second in a two-part mathematics sequence for prospective elementary school teachers. Addressing the Common Core and National Council of Teachers of Mathematics Standards, instruction will include algebraic thinking, use of variables, graphing algebraic equations, geometry, measurement, data analysis, statistics, and probability.

LEARNING OUTCOMES and ASSESSMENT:

Learning Outcomes are statements that specify what learners will know, understand, or be able to demonstrate at the end of a learning experience.

Types of Learning Outcomes include:

- ✓ Course Learning Outcome – Result of finishing a course.
- ✓ Program Learning Outcome – Result of finishing a program.
- ✓ Institutional Learning Outcome – Result of finishing a degree at an institution, reflecting the core learning values and experiences of all graduates.

A Signature Assignment is an assignment used to measure a student's mastery of a program or institutional learning outcome. If a course you are taking includes a Signature Assignment, it will be clearly marked (**SIGNATURE ASSIGNMENT**).

Access the following link(s) for information on the Program Learning Outcomes (PLOs) and Curriculum Map related to this course:

Click Here for Learning Outcomes

Access the following link(s) for information on the Institutional Learning Outcomes (ILOs) and Curriculum Map related to this course:

Click Here for Learning Outcomes

Prerequisites: MATU 206: Mathematics for Elementary School Teachers I

Restrictions: None

Essential Equipment and Facilities: By the end of the first week of class, students must have the ability to access MyBrandman, the Blackboard portal to their class site, and other key locations necessary to meet course requirements. Individual browser preferences vary, and, at times, some work with Blackboard better than others. Therefore, if you try one browser, such as Firefox, and you have difficulty, try another browser, such as Internet Explorer. Since versions of Microsoft Office vary, students who do not use the most recent version may need the free conversion

software available via the Microsoft.com website.   Java is also required for courses. Students who do not have Java may download it for free at java.com.
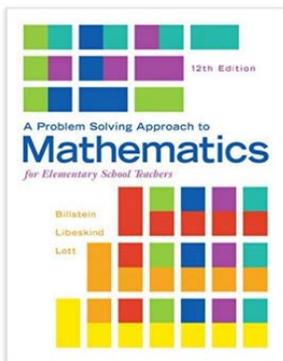
A. This course requires MyMathLab in order to access textbook videos, animation, help tools, step-by-step guided solutions, and homework. Flash Player and/or other downloads may be required for the tools in the site to run properly. If free downloads are required, these are stated on the MyMathLab site.

Academic Integrity: As a learning community of scholars, Brandman University emphasizes the ethical responsibility of all members to seek knowledge honestly and in good faith. Students are responsible for doing their own work. Academic dishonesty of any kind will not be tolerated. Violations of academic integrity include, but are not limited to, cheating, plagiarism, or misrepresentation of information in oral or written form. Plagiarism means presenting someone else's idea or writing as if it were your own. If you use someone else's idea or writing, be sure the source is clearly documented. Further information may be found in the *Brandman University Catalog* available under Academic Resources in MyBrandman.

Americans with Disabilities Act Statement: According to the Americans with Disabilities Act (ADA) of 1990, an individual with disability is defined as having functional limitations resulting from a diagnosed disability and applies to an individual who has a physical or mental impairment that substantially limits one or more of the individual's major life activities; has a record of such an impairment; or is regarded as having such an impairment. In compliance with ADA guidelines, students who have any condition, either permanent or temporary, that may impair or impact their ability to successfully complete assignments, tasks or satisfy course criteria are requested to notify their Advisor or Campus Director in order to understand how to apply for Student Disability Services. If and when the student is granted formal approval by the Director of ADA Services, both the student and professor will be notified. It is highly suggested that the student contact their professor to discuss the accommodations during the first week of the session. The granting of accommodations will not be retroactive and cannot jeopardize the academic standards or integrity of the course.

University Policies: Students are responsible for complying with university policies including, but not limited to: incompletes, course drops, and student conduct. Information may be found in the *Brandman University Catalog* available under Academic Resources in MyBrandman.

Required Text: Billstein, R., Libeskind, S., and Lott, J., (2015). A Problem Solving Approach to Mathematics for Elementary School Teachers, 12th ed., Boston: Pearson Education, Inc. ISBN-13: 978-0321990594 ISBN-10:0321990595

- This course requires MyMathLab to access textbook videos, animation, help tools, step-by-step guided solutions, and homework.
- When you purchase your book through the Brandman bookstore, your book will come with MyMathLab access. If you purchase the book elsewhere make sure the book comes with an unused access code. A used access code will not work.
- The access code cannot be shared with friends or family because it links to your assignments and scores.
- A digital copy of the text comes with MyMathLab access.
- If you purchased MyMathLab access for MATU 206 with the same textbook, you do not need to pay for this access a second time. Just "register" when you log onto your account with the new Course ID given by your instructor.

Texts are available at the Brandman Online Bookstore: See "Bookstore" under Academic Resources in MyBrandman.

Online Brandman Library Resources: Click on red "Library" button in Blackboard.

Course Learning Objectives:

By the end of the course, students should be able to:

1. Apply the Common Core Standards for Mathematics and the National Council of Teachers of Mathematics Principles and Standards for School Mathematics to build student understanding of a specific mathematical concept related to geometry or statistics.
2. Analyze and apply algebraic rules and operations to relations, functions, and coordinate geometry.
4. Demonstrate the appropriate use of central tendency, variation, normal distributions, and correlation in order to make inferences.
5. Portray statistical data using dot plots, stem and leaf plots, box plots, bar graphs, frequency polygons, circle graphs, histograms, and scatterplots.
6. Analyze and determine the basic and conditional probabilities, odds, and expected value to real world examples.
7. Define and apply basic geometric concepts, theorems, and properties of congruence, similarity, symmetry, tessellations.
8. Identify two and three dimensional geometric figures and transformations including: curves, angles, polygons, prisms, pyramids, cones, cylinders, and spheres.
9. Apply spatial reasoning to the effective teaching of length, area, surface area, and volume of geometric shapes.
10. Analyze and solve problems involving coordinate geometry including slope, collinearity, mid-point, slope, distance formula, equation of a circle, and the Pythagorean Theorem.

Major Study Units: The Common Core Standards for Mathematics and the National Council of Teachers of Mathematics Principles and Standards for School Mathematics are the principal guidelines for this course.

1. Real Numbers and Algebraic Thinking
2. Probability
3. Data Analysis and Statistics
4. Geometry
5. Congruence and Similarity
6. Constructions
7. Transformations
8. Area and the Pythagorean Theorem
9. Volume, Surface Area, Mass, and Temperature

Instructional Strategies: This course requires active participation. Instruction includes readings, videos, lectures, online discussions, homework, final exam, and the design of classroom activities. Specific strategies are further explained in the course Blackboard site. Instruction includes:

The Rule of Three: Every topic should be presented visually, numerically, and algebraically.

The Way of Archimedes: Formal definitions and procedures evolve from the investigation and problems.

On a weekly basis, students will write via online discussion boards and classroom activity development. Manipulatives, inquiry, and research are among the various methodologies used to augment instruction and promote higher-level thinking.

Attendance Policy

Requirements for students' attendance and participation will be defined by each instructor based on the following policy:

- Monday of the first week is considered the first day of class for online and blended instruction. This includes instruction for fully online classes and online instruction supporting blended classes.

- Regular onsite attendance is expected for student success. If a student misses more than one onsite class or one week of engagement in an online class, the student may, at the discretion of the instructor, fail the course. Students are expected to attend all classes, particularly the first night of class.

- Students should consider withdrawing from a course if they will be absent more than once. Instructors may, but are not obligated to, accommodate students under extraordinary circumstances, but the student must request accommodation and provide requested supporting documentation. Students enrolled in blended courses must attend at least one class during the first two weeks of classes.

- If a student misses a portion (e.g., arriving late or leaving early) of an onsite course, the student's grade may be adversely affected. Students who are not in attendance for at least 75 percent of any scheduled class may be considered absent for that class. Students should discuss missing portions of a class with their instructor to determine how their grade may be affected.

- Regular online attendance/participation and engagement is expected for student success in both fully online and blended courses. Online participation is evident through posting to a discussion board, blog, completing assignments including journal entries, or taking quizzes and exams.

- Schools and programs may have different attendance policies. Refer to school and program specific information for additional attendance policies.

Letter Grade/Percentage Equivalents:

<table>
<tr><th colspan="4">Grade Point System
(Rounded up at .5 and up)</th></tr>
<tr><td>A = 93%-100%</td><td>B = 83%-86%</td><td>C = 73%-76%</td><td>D = 63%-66%</td></tr>
<tr><td>A- = 90%-92%</td><td>B- = 80%-82%</td><td>C- = 70%-72%</td><td>D-= 60%-62%</td></tr>
<tr><td>B+ = 87%-89%</td><td>C+ = 77%-79%</td><td>D+ = 67%-69%</td><td>F=59% and below</td></tr>
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Methods of Evaluation for Determining Grades:

Assignment Detail for Blended Course:

Assignments for Blended Course (Rubrics in Course Information on Blackboard)	Points	Quantity	Total Possible Points
Lecture Three hour lectures will be delivered each week in class. Additionally, readings and	20	7	140

video lectures will be posted on Blackboard.			
Discussion Board Weekly discussion topics will be posted on Blackboard. Students are required to answer the initial post by Thursday and respond to three other classmates each week. Real examples will be discussed.	20	8	160
Homework MyMathLab homework assignments are found on www.coursecompass.com. There are fifteen 20-point homework assignments: two per week except the last week. You may repeat each question until you get the correct answer.	20	15	300
Hands-on Learning Activity Students will construct five K-8 mathematics classroom activities corresponding to the given topic provided in the week's lesson. Participants will outline the teacher's role and student process/project. Any 5 of the 7 topics may be chosen and completed.	50	5	250
Class Presentation On the last day of class, each student will give a 4-5-minute presentation sharing one of the lesson plans created for this class.	50	1	50
Final Exam A 50-question final covering the material learned throughout this class is found on MyMathLab/Course Compass. Questions may be repeated until you get the question correct.	100	1	100
			Total - 1000

Class by Class Outline for <u>Blended Course</u>:

Week	Topics	Assignments
Week 1	Real Numbers and Algebraic Thinking	Read Chapter 8 – pp. 388 - 464 Homework 1 and 2 Discussion Topic #1 Hands-on Learning Activity #1
Week 2	Probability	Read Chapter 9 – pp. 469 - 532 Homework 3 and 4 Discussion Topic #2 Hands-on Learning Activity #2
Week 3	Data Analysis/Statistics: An Introduction	Read Chapter 10 – pp. 537 - 615 Homework 5 and 6 Discussion Topic #3 Hands-on Learning Activity #3
Week 4	Introductory Geometry	Read Chapter 11 – pp. 621 - 686 Homework 7 and 8 Discussion Topic #4 Hands-on Learning Activity #4
Week 5	Congruence and Similarity with Constructions	Read Chapter 12 – pp. 691 - 753 Homework 9 and 10 Discussion Topic #5 Hands-on Learning Activity #5
Week 6	Congruence and Similarity with Transformations	Read Chapter 13 – pp. 757 - 809 Homework 11 and 12 Discussion Topic #6 Hands-on Learning Activity #6
Week 7	Area, Pythagorean Theorem, and Introduction to Three Dimensional Geometry	Read Chapter 14 – pp. 813 - 859 Homework 13 and 14 Discussion Topic #7 Hands-on Learning Activity #7
Week 8	Volumes, Surface Area, Mass, and Temperature	Read Chapter 14 – pp. 863 - 888 Homework 15 Discussion Topic #8

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		Hands-on Learning Activity – *In Class Presentation*
		Final Exam

Assignment Detail for <u>Fully Online Course</u>:

Assignments for Blended Course (Rubrics in Course Information on Blackboard)	Points	Quantity	Total Possible Points
Lecture Readings and video lectures will be posted on Blackboard.			
Discussion Board Fifteen discussion topics will be posted on Blackboard each week: two per week except the last week. Students are required to answer the initial post by Thursday and respond to three other classmates each week. Real examples will be discussed.	20	15	300
Homework MyMathLab homework assignments are found on www.coursecompass.com. There are fifteen 20-point homework assignments: two per week except the last week. You may repeat each question until you get the correct answer.	20	15	300
Hands-on Learning Activity Students will construct six K-8 mathematics classroom activities corresponding to the given topic provided in the week's lesson. Participants will outline the teacher's role and student process/project. Any 6 of the 7 topics may be chosen and completed.	50	6	300
Final Exam A 50-question final covering the material learned throughout this class is found on MyMathLab/Course Compass. Questions may be repeated until you get the question correct.	100	1	100
			Total - 1000

Class by Class Outline for <u>Online Course</u>:

Week	Topics	Assignments
Week 1	Real Numbers and Algebraic Thinking	Read Chapter 8 – pp. 388 - 464 Homework 1 and 2 Discussion Topics #1 and #2 Hands-on Learning Activity #1
Week 2	Probability	Read Chapter 9 – pp. 469 - 532 Homework 3 and 4 Discussion Topics #3 and #4 Hands-on Learning Activity #2
Week 3	Data Analysis/Statistics: An Introduction	Read Chapter 10 – pp. 537 - 615 Homework 5 and 6 Discussion Topics #5 and #6 Hands-on Learning Activity #3
Week 4	Introductory Geometry	Read Chapter 11 – pp. 621 - 686 Homework 7 and 8 Discussion Topics #7 and #8 Hands-on Learning Activity #4
Week 5	Congruence and Similarity with Constructions	Read Chapter 12 – pp. 691 - 753 Homework 9 and 10 Discussion Topics #9 and #10 Hands-on Learning Activity #5
Week 6	Congruence and Similarity with Transformations	Read Chapter 13 – pp. 757 - 809 Homework 11 and 12 Discussion Topics #11 and #12

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		Hands-on Learning Activity #6
Week 7	Area, Pythagorean Theorem, and Introduction to Three Dimensional Geometry	Read Chapter 14 – pp. 813 - 859 Homework 13 and 14 Discussion Topic #13 and #14 Hands-on Learning Activity #7
Week 8	Volumes, Surface Area, Mass, and Temperature	Read Chapter 14 – pp. 863 - 888 Homework 15 Discussion Topic #15 - **Hands-on Learning Activity - *Class Presentation*** Final Exam