

LANE COLLEGE

Syllabus

SPRING 2012

Methods of Teaching Secondary Mathematics

Course Number: **MAT331-01**
Instructor: **Dr. McCarthy**
Email: **pmccarthy@lanecollege.edu**

Classroom: **SBB 205**
Class Time: **TR 3:300 am- 4:50 pm**
Office: **STEM CENTER**

Course (Catalog) Description:

Methods and materials of teaching mathematics at the elementary level, including the appropriate use of technology in those methods and creation of materials. Designed to introduce the prospective elementary school teacher to the basic essentials of arithmetic, and some concepts of mathematics from a pedagogical perspective. This course is also available to in-service teachers. **Prerequisites: EDU 230 and MAT 125/126.**

Rationale based on Desired Outcomes of the Lane graduate, as stated in the College's Mission Statement:

1. The Lane graduate will be able to communicate in a variety of modes.
2. The Lane graduate will be able to acquire information on secondary math education.
3. The Lane graduate will be able to organize, comprehend, and make practical use of a wide variety of materials.
4. The Lane graduate will be able to apply knowledge in different contexts.

Major Objectives:

1. To produce teachers who are competent in their chosen field.
2. To foster an understanding of the uniqueness and value of each human.

Key Concepts of the Course – Major Topics

1. What it means to know and do mathematics
2. Designing mathematics instruction based on
 - a. Developmentally appropriate activities
 - b. Current research
 - c. Significant mathematical content
 - d. Supportive learning environment
3. Elements of problem solving
4. Integration of technology
5. Teacher content knowledge
 - a. Number concepts
 - b. Algebra
 - c. Measurement
 - d. Geometry
 - e. Data analysis

Requirements (Expectations)

The student is expected to:

1. Attend all classes punctually. Arrive on time and remain for the full period.
2. Prepare for class by reading ahead in the textbook. Classroom work and textbook reading are intended to supplement rather than duplicate each other; you are responsible for both.

3. Participate in problem solving exercises including solving problems on the blackboard when requested. Each student will be responsible for all class discussions and any subsequent test material that may result from these discussions.
4. Take all scheduled tests and quizzes. Turn in assigned homework on time. For article summaries, attach a copy of the article (with article information such as the name of the source, date, and author). Cooperate with the instructor in creating a dynamic learning environment.
5. Exercise integrity and honesty in preparing homework and taking tests and quizzes. All work turned in for credit must be your own.
6. Adhere to the dress code of Lane College. Students are the teachers of the future and will be role models for future generations. Attire should be appropriate and professional.
7. Refrain from eating and drinking in the classroom. No food is allowed unless it is part of a classroom activity. Cell phones, headphones, beepers, pagers, and other electronic equipment must be turned off and put away.

GRADING

- Attendance and participation 15%
- Quiz & Homework 15%
- Classroom-Teaching/Observation 15%
- Project/Activity 15%
- Final Portfolio 20%
- Final 20%

Articles and papers should be submitted on time.

The final grade for the course will be computed using the following criteria:

10 chapter quizzes @ 10 points each = 100 points (15% final grade)
 Classroom-Teaching/Observation @ 100 points= 100 points (15% final grade)
 Project/Activity @ 100 points (15% final grade)
 Class attendance/participation @ 100 points = 100 points (15% final grade)
 Midterm Exam @ 50 points = 50 points (20% final grade)
 Final Portfolio @ 50 points = 50 points (20% final grade)

Total available points = 500 points

Course grades will be assigned as follows:

- A: 90 - 100% = 450-500 total points
- B: 80 - 89% = 400 – 449 total points
- C: 70 - 79% = 350 –399 total points
- D: 60 - 69% = 300 – 349 total points
- F: 59% = 295 total points or less

Classroom assignments, homework, and quizzes are graded promptly and will not be accepted late. All other assignments must be handed in on time unless prior arrangements have been made. Late assignments result in point deduction.

The grading scale is summarized as follows:

<u>Points</u>	<u>Letter Grade</u>
90 - 100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

Expected Outcomes

Student should be able to

- Demonstrate an understanding of the concepts and skills of the following mathematics topics: counting and comparing, problem solving, numeration, addition and subtraction of whole numbers, multiplication and division of whole numbers, fractions, decimals, ration and proportion, percent, algebraic patterns, geometry, measurement, statistics and probability.
- Develop a body of procedure, activities and techniques for teaching particular concepts.
- Examine current technology (internet, computer software and calculator) in terms of its application in teaching elementary mathematics.
- Adapt instructional techniques to students of diverse backgrounds and to students who have special learning needs.
- Select or develop appropriate assessment procedures for use prior to and after instruction.
- Understand the philosophy, organization and curriculum of elementary schools and work with colleagues in planning and implementing appropriate education.
- Plan developmentally appropriate mathematics lessons that is focused on development of mathematics, reasoning, and problem solving skills.

Required Textbook(s)/Resources

A problem Solving Approach to Mathematics for Elementary School Teachers (10th Ed). Billstein, Libeskind and Lott- (ISBN: 13:978-0-321-57055-0); Secondary School Curriculum Document (Standards for School Mathematics); Ten Dimensions of Mathematics Education; and Keeping Learning on Track Document

Students must have their textbooks and document as soon as possible, but no later than **Monday, January 23, 2012.**

Note: The professor reserves the right to change the textbiik

Instructional Methods and Activities

A typical day in this class will consist of:

- Review previous day's assignment
- New concept presented (linked to previous) [students listen]
- Students discuss idea (using the state, elaborate, exemplify, illustrate model; and/or Socratic questioning)
- Students write about the idea
- Students assess each other's writing
- New idea is presented (linked to first)
- Repeat bullets 2 through 5 as time permits
- Assign section of textbook for students to read before the next class
- Chapters will be discussed in the class. Each class member will be expected to participate actively in course discussion, having read assigned materials before class. There will be opportunities to

share insights, articles, etc., as we discuss the readings, examine the topics assigned; each class participant is expected to attend all classes and take active role.

- Each class member will be expected to read an article-from education magazines or newspapers-about education (elementary or secondary) and write a summary. Articles will be discussed in the class.
- If you are unable to attend class, please notify the professor IN WRITING.
- Computer Lab Assignments: All students must complete computer work as assigned by the Instructor
- **All assignments MUST be handed in on time** unless prior arrangements have been made. (Late assignments result point deduction, 10% a day, Saturday and Sunday will count too)

Vocabulary Mastery

principle	percentage	rotation
standard	fraction	symmetry
benchmark	inverse	similar
fluency	identity	congruent
representation	rational number	graph
concept	prime number	irrational number
assessment	composite number	
rubric	integer	
problem	algorithm	
equivalent	probability	
cardinal	equation	
ordinal	length	
nominal	area	
discrete	volume	
exponent	plane figure	
base	space figure	
scientific notation	line segment	
proportion	ray	
ratio	angle	
commutative	polygon (name specific polygons)	
associative	polyhedron	
distributive	reflection	

Week Date	Topic
January 09-13, 2012	Information about the course. Hand out syllabus. Pre-Test
January 17-20, 2012	Preparing to Teach Mathematics
January 23-27, 2012	Ch.1 Introduction to Problem Solving/The Ten Dimensions of Mathematics Education
January 30-February 03, 2012	Ch.2 Numeration System and Sets/The Ten Dimensions of Mathematics Education Summary # 1 and Computer Lab Work, due
February 06-10, 2012	Ch.3 Whole Numbers and Their Operations/The Ten Dimensions of Mathematics Education
February 13-17, 2012	Ch.4 Algebraic Thinking/Formal Presentation of Instruction Summary # 2 and Computer Lab Work, due
February 20-24, 2012	Ch.5 Integers and Number Theory/Formal Presentation of Instruction/ Midterm Exam
February 27-March 02, 2012	Ch.6 Rational Numbers/Formal Presentation of Instruction Summary # 3 and Computer Lab Work, due
March 05-09, 2012	Ch.7. Decimals and Real Numbers/Keeping Learning on Track Math Workshop (10 points towards Class Test) Summary # 4 and Computer Lab Work, due
March 12-16, 2012	Ch.8 Proportional Reasoning/Keeping Learning on Track
March 19-23, 2012	SPRING BREAK
March 26-30, 2012	Ch. 9 Probability/Keeping Learning on Track Summary # 5 and Computer Lab Work, due
April 02-06, 2012	Ch. 10 Displaying Data/Keeping Learning on Track Summary # 6 and Computer Lab Work, due
April 09-13, 2012	Ch. 11 Introductory Geometry Classroom Teaching/Observing
April 16- 20, 2012	Ch.13 Concepts of Measurements Classroom Teaching/Observing
April 23-27, 2012	Ch.13 Concepts of Measurements Classroom Teaching/Observing

FINAL- [Portfolio: Computer Lab Work (50%); Other (50%)]
Due: April 24, 2012

LANE COLLEGE

Student Understandings

SPRING 2012

Course: MAT 330

Instructor Dr. McCarthy

1. I understand that I am responsible for completing reading and writing assignments using criteria and standards discussed in class. _____
2. I understand that in order to make a grade (A, B, C, or D) in this class I must fulfill all criteria so outlined in the syllabus. This includes Computer Lab Assignments. _____
3. I understand that the work of the course requires active participation. _____
4. I understand that I am expected to attend class punctually at all scheduled times. _____
5. I understand that no unexcused absences are allowed. "When the number of unexcused absences exceeds twice the credit hours, students may be requested to withdraw from the course..." _____
6. I understand that I must adhere to the dress code of Lane College. I understand that for male students, this includes no head coverings of any kind, including head bands and do-rags. _____
7. I understand that no food, drinks, or gum chewing is allowed in classrooms. _____
8. I understand that I must turn off and put away my cell phone, pager, beeper, and other electronic devices, as well as listening devices, before entering the classroom. _____
9. I understand that I must respect the instructor at all times, and otherwise adhere to Lane College policies and guidelines as stated in the *College Catalog* and the *Student Handbook*. _____
10. I understand that, by ***Monday, January 23, 2012*** I must have my textbook in class for every class period. _____

Name (print) _____ Signature _____

Cell Phone # _____ Alternative Phone # _____

Email _____

Parent/Guardian information

Name (print) _____

Phone # _____

Email _____