Curriculum Proposal Cover Sheet – form is available on-line as an interactive PDF

LSC Use Only Proposal No:	UWUCC Use Only Proposal No: 12-79
LSC Action-Date: AP-2/7/13	UWUCC Action-Date: App-4/2/13 Senate Action Date: App-4/30/13

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person(s)	Email Address
Edel Reilly	ereilly@iup.edu
Proposing Department/Unit	**Phone**
Mathematics	7-7907

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

_____ New Course _____ Course Prefix Change _____ Course Deletion

__X__ Course Revision _____ Course Number and/or Title Change _____ Catalog Description Change

Current course prefix, number and full title: MATH 152: Elements of Math II

Proposed course prefix, number and full title, if changing:

2. Liberal Studies Course Designations, as appropriate

__X__ This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

_____ Learning Skills __X__ Knowledge Area _____ Global and Multicultural Awareness _____ Writing Intensive (include W cover sheet)

__X__ Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

_____ Global Citizenship _____ Information Literacy _____ Oral Communication

__X__ Quantitative Reasoning _____ Scientific Literacy _____ Technological Literacy

3. Other Designations, as appropriate

_____ Honors College Course _____ Other: (e.g. Women's Studies, Pan African)

4. Program Proposals

_____ Catalog Description Change _____ Program Revision _____ Program Title Change _____ New Track

_____ New Degree Program _____ New Minor Program _____ Liberal Studies Requirement Changes _____ Other

Current program name:

Proposed program name, if changing:

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)	Edel Reilly	10/11/12
Department Chairperson(s)		11/15/12
College Curriculum Committee Chair	Anne Kondo	12/10/12
College Dean		12/12/12
Director of Liberal Studies (as needed)		3/14/13
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate	Edel Reilly (TECC Chair) Edward Nardi Dean	1/28/13
UWUCC Co-Chairs	Gail Sechrist	4/2/13

Received MAR 14 2013 Liberal Studies

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Elements of Math II

Overview of changes from original syllabus of record

1. Objectives: The course objectives were aligned with the Expected Undergraduate Student Learning Outcomes as part of Liberal Studies Elective Revisions.
2. An additional objective has been included
3. An additional supplemental reading was assigned that addresses Responsible Learners
4. An example of a class assignment is included that addresses Responsible Learners.

MATH 152: Elements of Math II

SYLLABUS OF RECORD

I. CATALOG DESCRIPTION

MATH 152 Elements of Mathematics II 3c-0l-3cr

Prerequisite: MATH 151

Topics included are organizing and analyzing data, statistics, probability, geometric shapes, measurement, congruence and similarity, coordinate geometry, and transformational geometry.

II. COURSE OBJECTIVES

RELATIONSHIP OF COURSE TO COLLEGE CONCEPTUAL FRAMEWORK: The College of Education has developed a teacher education program based upon a preservice teacher who is competent in content and pedagogy. MATH 152 is a content course which broadens and deepens the student's knowledge of the mathematics content of the elementary grades as a vehicle to develop a pedagogical framework for learning to teach mathematics. In the course, students use a variety of materials for learning, work with conceptual models, use conceptual models to do mathematics, perform activities that develop new perspectives, and demonstrate competence in elementary and middle school mathematics. These activities help preservice teachers become reflective practitioners who are capable of inquiry into a variety of methods of communicating mathematics while learning to collaborate and interact with their peers and with experienced teachers.

Objective 1:
Examine and develop elementary and middle school geometry content, critical concepts and principles, and skills.
Expected Student Learning Outcomes 1 and 2:
Informed and Empowered Learners
Rationale:
Assignments will require students to have a level of knowledge of elementary geometry that will enable them to understand the geometry taught at the elementary and middle level schools. Assignments will also require students to critically analyze features of shapes, transformations, and coordinate geometry. Students will be asked to demonstrate their knowledge by developing mathematical arguments about geometric relationships, use visualization, spatial reasoning, and geometric modeling to solve problems.

Objective 2:
Examine and develop elementary and middle school measurement content, concepts, and skills
Expected Student Learning Outcomes 1 and 2:
Informed and Empowered Learners
Rationale:
Assignments will require students to have a level of knowledge of measurement that will enable them to understand the underlying structure of measures and the requirements for taking measurements. Assignments will also require students to critically analyze the fundamental ideas of measurement: the need to select a

measurable attribute, the concept that measurement involves comparison, and the need and role of units. Students will be asked to develop and apply appropriate techniques, tools, and formulas to determine measurements.

Objective 3:
Examine and develop elementary and middle school data analysis and probability content, concepts, and skills.
Expected Student Learning Outcomes 1 and 2:
Informed and Empowered Learners
Rationale:
Assignments will require students to have a level of knowledge of data analysis and probability that will enable them to interpret data from a variety of settings and to recognize trends in these data. Assignments will also require students to interpret, critically analyze, and use numerical and graphical data. Assignments will also allow students to explore and apply basic concepts of probability.

Objective 4:
Analyze and explain mathematical representations such as formulas, using deductive and other reasoning, problem solving, and communication in order to gain insight and perspective into the nature of mathematics as taught in the elementary and middle school, including appropriate applications of technology.
Expected Student Learning Outcomes 1 and 2:
Informed and Empowered Learners
Rationale:
Assignments will require students to build new mathematical knowledge through problem solving, and to solve problems that arise in math and in other contexts. Assignments will also require students to recognize reasoning as a fundamental aspect of mathematics and to develop and evaluate mathematical arguments. Assignments will allow students to communicate their mathematical thinking through both written and oral forms of communication, and use the language of mathematics to express mathematical ideas precisely.

Objective 5:
Demonstrate knowledge and application of mathematics by actively engaging in problem solving, applying multiple strategies to solve problems, using critical thinking to make sense of solutions found and modeling and making connections to real world phenomenon in current and historical contexts.
Expected Student Learning Outcomes 1 and 2:
Informed and Empowered Learners
Rationale:
Assignments will require students to apply and adapt a variety of appropriate problem solving strategies and to monitor and reflect on the process of mathematical problem solving. Assignments will also require students to recognize and apply mathematics in contexts outside of mathematics.

Objective 6:
Examine social, political, and economic justice issues using mathematics.
Expected Student Learning Outcomes 3
Responsible Learners
Rationale:

Assignments in this course will require students to use mathematical concepts to explore social issues more deeply. These assignments are designed to enable students to apply mathematical skills to real-world social justice problems.

Course Objective	College Conceptual Framework / Danielson	INTASC Standard /Principle	NCATE / ACEI Elementary Education Program Standard	Course Assessment Measuring Objective
1	1a – Content & Pedagogy	1, 4	2.3 Mathematics	**Outcomes Assessment: Geometry Exam**
2	1a – Content & Pedagogy	1, 4	2.3 Mathematics	Tests, Projects, and Quizzes
3	1a – Content & Pedagogy	1, 4	2.3 Mathematics	Tests, Projects, and Quizzes
4	1a – Content & Pedagogy	1, 4	2.3 Mathematics	Tests, Projects, and Quizzes
5	1b – Knowledge of Students	9	2.3 Mathematics	Projects and Quizzes
6	2-The classroom environment	2	2.3 Mathematics	In-class assignments

III. COURSE OUTLINE / TIME SCHEDULE

A. Statistics (*Objectives #3, #4, #5, #6*) 12 academic hours
1. Organizing and Picturing Information
2. Analyzing Data
3. Misleading Graphs and Statistics

B. Probability (*Objectives #3, #4, #5*) 10 academic hours
1. Probability and Simple Experiments
2. Probability and Complex Experiments
3. Simulations, Expected Value, Odds, and Conditional Probability
4. Additional Counting Techniques

C. Geometric Shapes (*Objectives #1, #4, #5*) 4 academic hours
1. Recognizing Geometric Shapes and Definitions
2. Analyzing Shapes
3. Properties of Geometric Shapes: Lines and Angles
4. Regular Polygons and Tessellations
5. Describing Three-Dimensional Shapes

D. Measurement (*Objectives #2, #4, #5*) 5 academic hours
1. Measurement with Nonstandard and Standard Units
2. Length and Area
3. Surface Area
4. Volume

E. Geometry Using Triangle Congruence and Similarity (*Objectives #1, #4*) 3 academic hours

1. Congruence of Triangles
2. Similarity of Triangles
3. Basic Euclidean Constructions
4. Additional Euclidean Constructions
5. Geometric Problem Solving Using Triangle Congruence and Similarity

F. Geometry Using Coordinates (*Objectives #1, #4*) 2 academic hours
1. Distance and Slope in the Coordinate Plane
2. Equations and Coordinates
3. Geometric Problem Solving Using Coordinates

G. Geometry Using Transformations (*Objectives #1, #4*) 2 academic hours
1. Transformations
2. Congruence and Similarity Using Transformations
3. Geometric Problem Solving Using Transformations

This syllabus covers 38 academic hours leaving 4 academic hours for testing and/or review. The final is an additional 2 academic hours.

IV. EVALUATION METHODS

Criteria used in assessing the competency of the student will vary depending upon the instructor, but generally include examinations, projects, presentations, lab activities, writing assignments, and class participation.

More specifically, the following guidelines are recommended:

45% Tests (tests and final).

15% Geometry Test (***Key Assessment)***

20% Participation and Quizzes. Participation includes attendance, homework, and in-class activities. Quizzes provide a formative assessment of class members' understandings and fulfillment of course outcomes.

20% Projects

V. EXAMPLE GRADING SCALE

90 – 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
0 - 59%	F

VI. UNDERGRADUATE-COURSE ATTENDANCE POLICY

The course attendance policy is consistent with the Undergraduate Catalog.

VII. REQUIRED TEXT

Beckmann, S. (2011). *Mathematics for Elementary Teachers.* Boston: Pearson

SUPPLEMENTAL READING:

Gutstein, E., & Peterson, B. (Eds.). (2006). *Rethinking mathematics: Teaching social justice by the numbers.* Milwaukee, WI: Rethinking Schools, Ltd.

VIII. SPECIAL RESOURCE REQUIREMENTS

None.

IX. BIBLIOGRAPHY

Bartell, T. G. (2011) Learning to teach mathematics for social justice: Negotiating social justice and mathematical goals. Report to Diversity in Mathematics Education Center for Learning and Teaching. Reston, VA: National Council of Teachers of Mathematics.

Bassarear, T. (2005). Mathematics for Elementary School Teachers. Boston, MA: Houghton Mifflin.

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Bigelow, B., Harvey, B., Karp, S., & Miller, L. (Eds.). (2001). *Rethinking our classrooms, Volume 2: Teaching for equity and justice.* Milwaukee, WI: Rethinking Schools, Ltd.

Burns, M. (2000). About teaching mathematics: A K-8 resource. Sausalito, CA: Math Solutions Publications.

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Carraher, T. N., Carraher, D., W., & Schliemann, A. D. (1985). Mathematics in the streets and in schools. *British Journal of Development Psychology, 3*, 21-29.

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Frankenstein, M. (1997). In addition to the mathematics: Including equity issues in the curriculum. In Trentacosta & M. Kenney (Eds.), *Multicultural and gender equity in the mathematics classroom* (pp. 10-22). Reston, VA: National Council of Teachers of Mathematics.

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Kenschaft, P. C. (2005). *Change is possible: Stories of women and minorities in mathematics.* Providence, RI: American Mathematical Society.

Long, C. & DeTemple, D. (2006). Mathematical reasoning for elementary teachers. NY: Pearson Education.

Masingila, J. O., Lester, F. K., & Raymond, A. M. (2002). Mathematics for elementary teachers via problem solving. Upper Saddle River, New Jersey: Prentice Hall.

Musser, Burger, & Peterson. (2006). Mathematics for Elementary Teachers: A Contemporary Approach, Seventh Edition. New York: John Wiley & Sons.

National Council of Teachers of Mathematics. Teaching Children Mathematics. Reston, Virginia. (Formerly known as the Arithmetic Teacher)

National Council of Teachers of Mathematics. Yearbooks. Reston, Virginia

National Council of Teachers of Mathematics. Mathematics Teaching in the Middle School. Reston, Virginia

National Council of Teachers of Mathematics. Curriculum and Evaluation Standards for School Mathematics, Addenda Series. Reston, Virginia

National Council of Teachers of Mathematics. (1989) Curriculum and evaluation standards for school mathematics. Reston, Virginia: The National Council of Teachers of Mathematics.

National Council of Teachers of Mathematics. Navigations Series. Reston, Virginia: The National Council of Teachers of Mathematics.

National Council of Teachers of Mathematics. (2000) Principles and standards for school mathematics. Reston, Virginia: The National Council of Teachers of Mathematics.

National Council of Teachers of Mathematics. (1991) Professional standards for teaching mathematics. Reston, Virginia: The National Council of Teachers of Mathematics.

National Council of Teachers of Mathematics. (1995) Assessment standards. Reston, Virginia: The National Council of Teachers of Mathematics.

O'Daffer, P. G., Clemens, S. R.(1992). *Geometry: and investigative approach.* Menlo Park, CA: Addison-Wesley.

O'Daffer, P., Charles, R., Cooney, T., Dossey, J., Schielack, J. (2005). *Mathematics for Elementary School Teachers.* NY: Pearson Education.

Presmeg, N. G. (2007). The role of culture in teaching and learning mathematics. In F. J. Lester, Jr. (Ed.), *Second Handbook of Research on Mathematics Teaching and Learning* (pp. 435-458).Reston, VA: National Council of Teachers of Mathematics.

Smith, N., Lambdin, D., Lindquist, M., & Reys, R. (2001). *Teaching elementary mathematics: A resource for field experiences.* NY: John Wiley & Sons.

Sonnabend T. (2004). *Mathematics for teachers: An introductory approach for grades K-8.* California: Thomson Brooks/Cole.

Steen, L. A. (2004). *Achieving quantitative literacy: An urgent challenge for higher education.* Washington, DC: Mathematical Association of America.

Van De Walle, J., Karp, K., Bay-Williams, J. (2013). *Elementary and middle school mathematics: Teaching developmentally.* Upper Saddle River, NJ: Pearson.

Old Syllabus of Record

I. CATALOG DESCRIPTION

MATH 152 Elements of Mathematics II 3c-0l-3cr

Prerequisite: MATH 151

Topics included are organizing and analyzing data, statistics, probability, geometric shapes, measurement, congruence and similarity, coordinate geometry, and transformational geometry.

II. COURSE OUTCOMES

RELATIONSHIP OF COURSE TO COLLEGE CONCEPTUAL FRAMEWORK: The College of Education has developed a teacher education program based upon a preservice teacher who is competent in content and pedagogy. MATH 152 is a content course which broadens and deepens the student's knowledge of the mathematics content of the elementary grades as a vehicle to develop a pedagogical framework for learning to teach mathematics. In the course, students use a variety of materials for learning, work with conceptual models, use conceptual models to do mathematics, perform activities that develop new perspectives, and demonstrate competence in elementary school mathematics. These activities help preservice teachers become reflective practitioners who are capable of inquiry into a variety of methods of communicating mathematics while learning to collaborate and interact with their peers and with experienced teachers.

The student will:

1. develop and demonstrate knowledge of elementary school geometry content, concepts, and skills.
2. develop and demonstrate knowledge of elementary school measurement content, concepts, and skills.
3. develop and demonstrate knowledge of elementary school data analysis and probability content, concepts, and skills.
4. use and explain mathematical representations, reasoning, problem solving, and communication in order to gain insight and perspective into the nature of mathematics as taught in the elementary school.
5. demonstrate that one is a learner and doer of mathematics by actively engaging in problem solving, applying multiple strategies to solve problems, and making sense of solutions found.

Course Objective	College Conceptual Framework / Danielson	INTASC Standard /Principle	NCATE / ACEI Elementary Education Program Standard	Course Assessment Measuring Objective
1	1a – Content & Pedagogy	1, 4	2.3 Mathematics	**Outcomes Assessment: Geometry Exam**
2	1a – Content & Pedagogy	1, 4	2.3 Mathematics	Tests, Projects, and Quizzes
3	1a – Content & Pedagogy	1, 4	2.3 Mathematics	Tests, Projects, and Quizzes
4	1a – Content & Pedagogy	1, 4	2.3 Mathematics	Tests, Projects, and Quizzes

5	1b – Knowledge of Students	9	2.3 Mathematics	Projects and Quizzes

III. COURSE OUTLINE / TIME SCHEDULE

A. Statistics (*Objectives #3, #4, #5*) 12 academic hours
1. Organizing and Picturing Information
2. Analyzing Data
3. Misleading Graphs and Statistics

B. Probability (*Objectives #3, #4, #5*) 10 academic hours
1. Probability and Simple Experiments
2. Probability and Complex Experiments
3. Simulations, Expected Value, Odds, and Conditional Probability
4. Additional Counting Techniques

C. Geometric Shapes (*Objectives #1, #4, #5*) 4 academic hours
1. Recognizing Geometric Shapes and Definitions
2. Analyzing Shapes
3. Properties of Geometric Shapes: Lines and Angles
4. Regular Polygons and Tessellations
5. Describing Three-Dimensional Shapes

D. Measurement (*Objectives #2, #4, #5*) 5 academic hours
1. Measurement with Nonstandard and Standard Units
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1. Transformations
2. Congruence and Similarity Using Transformations
3. Geometric Problem Solving Using Transformations

This syllabus covers 38 academic hours leaving 4 academic hours for testing and/or review. The final is an additional 2 academic hours.

IV. EVALUATION METHODS

Criteria used in assessing the competency of the student will vary depending upon the instructor, but generally include examinations, projects, presentations, lab activities, writing assignments, and class participation.

More specifically, the following guidelines are recommended:

45% Tests (tests and final). Tests provide a summative assessment of topics covered and fulfillment of course outcomes (*e.g., Geometry Exam to cover geometry*). Performance assessments consist of group and individual tasks and may be used as formative as well as summative evaluations.

20% Participation and Quizzes. Participation includes attendance, homework, and in-class activities. Quizzes provide a formative assessment of class members' understandings and fulfillment of course outcomes.

20% Projects. Projects include but are not limited to: in-class activities, in-class presentations, small-group project problems, course topic reflections, reviews of elementary school journals and textbooks, and a portfolio of student's work. Group and individual projects are assigned. Projects show students' understandings and application of course topics in order to fulfill course outcomes.

V. EXAMPLE GRADING SCALE

90 – 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
0 - 59%	F

VI. UNDERGRADUATE-COURSE ATTENDANCE POLICY

The course attendance policy is consistent with the University policy.

VII. REQUIRED TEXT

Musser, Burger, & Peterson. (2006). Mathematics for Elementary Teachers: A Contemporary Approach, Seventh Edition. New York: John Wiley & Sons.

VIII. SPECIAL RESOURCE REQUIREMENTS

None.

IX. BIBLIOGRAPHY

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Bennett, A. B & Nelson, L. T. (2004). Mathematics for elementary teachers: A conceptual approach. Boston, MA: McGraw-Hill.

Burns, M. (2000). About teaching mathematics: A K-8 resource. Sausalito, CA: Math Solutions Publications.

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Sonnabend T. (2004). Mathematics for teachers: An introductory approach for grades K-8. California: Thomson Brooks/Cole.

Van De Walle, J. (2007). Elementary and middle school mathematics: Teaching developmentally. New York: Pearson.

Sample Assignment and Rubric

Name: _____

Newspaper Activity: Interpretation of Graphs

Directions:

- Obtain a copy of a newspaper (USA Today is a good choice).
- Select **two different** graphs **from two different articles.**
- Write a paragraph (4-5 sentences) on each graph that summarizes the articles. Your paragraphs should include:
  - A brief description of the article
  - The type of graph used
  - Why that type of graph was used?
  - How the graph was used to reinforce the main points of the article.
- Your paragraph should be typed in 12-point font. Attach the graph **only** beside your paragraph on the paper.

Grading Rubric	**Detailed/concise (3)**	**Some details given (2)**	**Missing details/unclear (1-0)**
Description of the **first** article	☐	☐	☐
Define the first graph used and why the authors chose it	☐	☐	☐
Explained how the first graph was used	☐	☐	☐
Description of the second article	☐	☐	☐
Define the second graph used and why the authors chose it	☐	☐	☐
Explained how the second graph was used	☐	☐	☐
Included graphs **only**			2
Total Points (20)			

Additional Comments:

The purpose of this assignment is to investigate racial profiling. Minority groups for some time have complained about what they believe to be unfair police practices: being stopped, searched, harassed, and sometimes arrested solely because they are of a particular race. But is this true? How can we know? Can mathematics be a useful tool in helping us answer this question?

Probability ideas covered: randomness, experimentation, simulation, sample size, experimental and theoretical probability, and the law of large numbers.

Each group of students is given a small bag with colored cubes to approximate the racial breakdown of Chicago (http://chicagohealth77.org/characteristics/demographics). The bag contains 8 black cubes (African American), 8 pink cubes (whites), 6 red cubes (Latinos), and 2 green cubes (other groups) to represent the major racial groups. The students are not told the total number of cubes or how many of each color.

Part 1: Have students pick one cube from a bag without looking into the bag, record its color (using tally marks), and replace the cube. Repeat this 100 times. After every 10 picks, have them record the totals. Each line in the chart is a cumulative total of picks.

Discussion questions posed to the class following completion of the table:

1. What do you think is in the bag? Why do you think this?
2. What happened as you picked more times and what do you think would happen if you picked 1,000 times?

Part 2: Provide students with data provided from Illinois police records.
Sample:

- *In an area of one million motorists, approximately 28,000 were Latinos.*
- *During a 10 year period, state police made 14,750 discretionary traffic stops (changing lanes without signaling, driving one to five miles per hour over the limit).*
- *Of these stops, 3,100 were Latinos.*

The students would use what they learned above and create their own simulation of this situation using cubes. Students would decide what would be a reasonable representation of Latino drivers to place in their bag. Then the students pick and replace a cube 100 times, record the data, and calculate the results of simulating 100 discretionary stops.

Class discussion questions:

1. If 28,000 motorists were Latinos out of 1 million total, what percentage of motorists were Latinos?
2. How many cubes represented Latinos in your simulation? How many total cubes did you use?
3. In your simulation, how many Latinos were picked out of 100 picks? What was the percentage?
4. What percentage of discretionary traffic stops involved Latinos?
5. Do the results from your simulation support the claim of racial profiling? Why or why not?
6. Combine individual groups' results and analyze as a whole class.

Individual writing questions:

1. What did you learn from this activity?
2. How did mathematics help you understand the issue?
3. Do you think racial profiling is a problem, and if so, what do you think should be done about it?
4. What questions does this assignment raise in your mind?

Sample of recording sheet used in Part 1.

Determining the racial breakdown of the population of Chicago												
Total # of picks	**Whites**			**African Americans**			**Latinos**			**Asians**		
	#	**fraction**	**%**	**#**	**fraction**	**%**	**#**	**fraction**	**%**	**#**	**fraction**	**%**
10												
20												
30												
40												
50												
60												
70												
80												
90												
100												

This is an in-class assignment. The following grading rubric will be used.

___ Target: Clear and effective explanation of strategies used. All steps clearly identified using refined and complex reasoning. Correctly applied procedures discussed in class. Mathematically relevant observations were made.

__ Satisfactory: Clear explanations of strategies used were given. Steps were identified using effective mathematical reasoning. All math is correct.

__ Unsatisfactory: There is no explanation of the strategies used or the explanation does not relate to the problem. There is no evidence of mathematical reasoning. Several mathematical errors throughout the assignment.

Answers to Liberal Studies Questions

A. Within the department, there is a curriculum committee, the Elementary Mathematics Education Committee (EMEC), which oversees this course's scheduling, staffing, and the textbook selection. Most sections of this course are taught by members of EMEC who regularly meet and discuss issues related to the course. A Reflective Practice group was formed by the members of EMEC and continues to meet to discuss various instruction practices used in MATH 151.

B. There are many contributions to the mathematics in this course. Algorithms, games, and visual representations come from many cultures. As mathematics educators who teach this course, we are aware of the need to recognize cultural and individual contributions. This course is presented in ways that provide perspectives to future teachers for teaching to all children with problem solving, cooperative learning, visual, and hands on approaches. The approaches we use to teach content are those that are recognized in the field for teaching children with learning disabilities, English-Language Learners, minorities, and women. In so doing, this enables us to use this course as a foundation for experiencing the mathematics and pedagogy that is presented in subsequent courses delivered to education majors. In the textbooks we use for this course, authors explicitly give contributions to the mathematics by other cultures, women, and minorities. These textbook features are made mandatory reading assignments and used in classroom lessons by instructors of the course.

C. This course includes topics about social and economic justice issues to help students better understand how the mathematical concepts being studied apply to the real world. Examples will also allow students to use mathematics to examine the social-dynamic contexts of their lives. For example, in the unit on Data Analysis and Probability, students will work with data regarding equity issues and racial profiling. The inclusion of these types of real-world examples and assignments help students to develop a grounded understanding of mathematics and how mathematical concepts can be applied in valuable ways in society.

D. This course is intended for selected majors who have chosen education as their major. The focus of this course is to develop perspectives appropriate for understanding mathematics in ways that make sense to children. As such, mathematics is presented in non-standard ways, such as using blocks, counters, or visual representations to show a mathematical concept or idea. Students practice the mathematics they have already learned, but also, students are involved in activities that show the math in ways they may not have seen or approaches they may have forgotten.