**1. COURSE TITLE\*:** Math for the Educator I

**2. CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*:** MATH 2237

**3. PREREQUISITE\*:** One of the following:

* Math 118 or Math 1118
* Three years of college preparatory math with a grade of C or

above.

**4. Course Time Location (Course Syllabus – Individual Instructor Specific)**

**5. CREDIT HOURS\*:** 3 **LECTURE HOURS\*:** 3

**LABORATORY HOURS\*:** 0 **OBSERVATION HOURS\*:** 0

**6. FACULTY CONTACT INFORMATION: (Course Syllabus – Individual Instructor Specific)**

**7. COURSE DESCRIPTION\*:**

This course includes math topics that are fundamental to elementary education. Topics include a review of problem solving, set theory, numeration systems, whole numbers, decimals, fractions, signed numbers, and the basic binary operations, with an emphasis on the use of manipulatives and visual representations to teach elementary mathematics.

**8. LEARNING OUTCOMES\*:**

At the completion of this course the student will be able to:

1. Numbers

The successful Mathematics in Elementary Education student can:

1a. Discuss the intricacies of learning to count, including the distinction between counting as a list of numbers in order and counting to determine a number of objects, and use pairings between elements of two sets to establish equality or inequalities of cardinalities.

1b. Attend closely to units (e.g., apples, cups, inches, etc.) while solving problems and explaining solutions.

1c. Discuss how the base-ten place value system (including extending to decimals) relies on repeated bundling in groups of ten and how to use objects, drawings, layered place value cards, base-ten blocks, and numerical expressions (including integer exponents) to help reveal base-ten structure.

1d. Use the CCSS (Common Core State Standards) development of fractions: • Start with a whole. • Understand the fraction 1/b as one piece when the whole is divided into b equal pieces. • Understand the fraction a/b as a pieces of size 1/b and that the fraction a/b may be larger than one. • Understand fractions as numbers that can be represented in a variety of ways, such as with lengths (esp. number lines), areas (esp. rectangles), and sets (such as a collection of marbles). • Use the meaning of fractions to explain when two fractions are equivalent.

1e. Model positive versus negative numbers on the number line and in real-world contexts.

1f. Reason about the comparison (=, ) of numbers across different representations (such as fractions, decimals, mixed numbers, ...).

1g. Demonstrate the skill of calculating simple arithmetic problems WITHOUT the use of a calculator.

1. Operations

The successful Mathematics in Elementary Education student can:

2a. Recognize addition, subtraction, multiplication, and division as descriptions of certain types of reasoning and correctly use the language and notation of these operations.

2b. Illustrate how different problems are solved by addition, subtraction, multiplication and division and be able to explain how the operation used is connected to the solving of the problem.

2c. Recognize that addition, subtraction, multiplication, and division problem types and associated meanings for the operations (e.g., CCSS, pp. 88–89) extend from whole numbers to fractions and decimals.

2d. Employ teaching/learning paths for single-digit addition and associated subtraction and single-digit multiplication and associated division, including the use of properties of operations (i.e., the field axioms).

2e. Compare and contrast standard algorithms for operations on multi-digit whole numbers that rely on the use of place-value units (e.g., ones, tens, hundreds, etc.) with mental math methods students generate.

2f. Use math drawings and manipulative materials to reveal, discuss, and explain the rationale behind computation methods.

2g. Extend algorithms and mental math methods to decimal arithmetic.

2h. Use different representations of the same fraction (e.g., area models, tape diagrams) to explain procedures for adding, subtracting, multiplying, and dividing fractions. (This includes connections to grades 6–8 mathematics.).

2i. Explain the connection between fractions and division, a/b = a ÷ b, and how fractions, ratios, and rates are connected via unit rates. (This includes connections to grades 6–8 mathematics. See the Ratios and Proportional Relationships Progression for a discussion of unit rate.).

2j. Explain why the extensions of the operations to signed numbers make sense.

1. Algebraic Thinking

The successful Mathematics in Elementary Education student can:

3a. Model and communicate their reasoning about quantities and the relationships between quantities using a variety of representations.

3b. Discuss the foundations of algebra in elementary mathematics, including understanding the equal sign as meaning “is the same [amount] as” rather than a “calculate the answer” symbol.

3c. Look for regularity in repeated reasoning, describe the regularity in words, and represent it using diagrams and symbols and communicate the connections among these.

3d. Articulate, justify, identify, and use properties of operations.

3e. Describe numerical and algebraic expressions in words, parsing them into their component parts, and interpreting the components in terms of a context.

3f. Use a variety of methods (such as guess and check, pan balances, strip diagrams, and properties of operations) to solve equations that arise in “real-world” contexts.

1. Number Theory

The successful Mathematics in Elementary Education student can:

4a. Demonstrate knowledge of prime and composite numbers, divisibility rules, least common multiple, greatest common factor, and the uniqueness (up to order) of prime factorization.

4b. Discuss decimal representation and recognize that there are numbers beyond integers and rational numbers.

**9. ADOPTED TEXT(S):**

*Contemporary Mathematics*

First Edition

Kirk, Donna et. al.

Download for free at <https://openstax.org/details/books/contemporary-mathematics>

**10. OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.) \*\***

A calculator that can perform basic arithmetic operations is required.

**11. GRADING\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

 A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: Below 60

**12.** **GRADING PROCEDURES OR ASSESSMENTS: *(Course Syllabus – Individual Instructor Specific)***

**EXAMPLES BELOW:**

|  |
| --- |
| *Example 1 - By Percent* |
|  Homework 10% Quizzes/Tests 65% Project 15% Presentation 10% Total 100% |

|  |
| --- |
| *Example 2*  |
| *Category* | *By Total Points* | *% of Grade* |
| Homework (20x10) | 200 | 10% |
| Quizzes/Tests (5x360) | 1800 | 90% |
| Total | 2000 | 100% |

|  |
| --- |
| *Example 3* |
| *Category* | *By Total Points* | *% of Grade* |
| Online Quizzes | 400 | 10% |
| Online Tests (6x100) | 600 | 15% |
| Notebook (2x500) | 1000 | 25% |
| Midterm | 1000 | 25% |
| Final | 1000 | 25% |
| Total | 4000 | 100% |

**13. COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

The course design provides instruction and materials to support the course objectives. Classes may consist of a variety of means to accomplish this including but not limiting to: lectures, class discussions, small group projects, supplemental materials, and outside assignments. Practice is an important part of the learning process. For every one hour of class time, two additional hours of study time should be expected.

**14. COURSE OUTLINE:** ***(Course Syllabus – Individual Instructor Specific)***

|  |  |  |
| --- | --- | --- |
| WEEK | TOPIC | LEARNING OUTCOMES |
| 1 | Problem-solving strategies, reasoning, representations | 1a, 1b, 3a |
| 2 | Whole numbers & place value | 1a, 1b, 1c |
| 3 | Operations with whole numbers | 2a, 2b, 2d, 2e |
| 4 | Number theory (factors, primes, divisibility) | 2a, 2b, 2d, 2e, 2f |
| 5 | Integers & negative numbers | 1e, 2j |
| 6 | Fractions: concepts & models | 1d, 2h, 2i |
| 7 | Fractions: Equivalence and Comparison | 1d, 1f, 2h |
| 8 | Fractions: operations | 2h, 2i, 1d |
| 9 | Decimals & percents | 1c, 1f, 2g, 4b |
| 10 | Ratios & proportions | 2i, 3a |
| 11 | Real numbers & irrationals | 4a, 1g |
| 12 | Problem-solving practices (Polya) | 3b, 3c, 3d, 3f |
| 13 | Connecting math to teaching | 3d, 3e, 3f |
| 14 | Technology & manipulatives | 1 – 4, emphasis 2f, 3a |
| 15 | Preparing final project | 1 – 4  |
| 16 | Finals Week | 1 – 4  |

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

 This course is delivered fully online and asynchronously through Canvas, SSCC's learning management system. It is designed to support flexible, independent learning while promoting deep engagement with course materials, peers, and real-world applications.

The instructional approach is **project-based and discussion-driven**, encouraging students to apply concepts to practical, relevant scenarios. The course methodology includes the following components:

* **Video Lectures**: Instructor-created video presentations introduce key concepts, frameworks, and theories. These are designed for self-paced learning and are typically 10–20 minutes in length to support focus and retention.
* **Curated Multimedia Resources**: Students will engage with a range of high-quality, curated video content, podcasts, and visual explainers from trusted industry sources to gain multiple perspectives on the subject matter.
* **Industry Blogs and Articles**: Weekly readings include current blogs and articles from practitioners and thought leaders. These readings aim to connect academic concepts with real-world trends and professional discourse.
* **Discussion Forums**: Asynchronous discussion forums will be used for peer interaction, knowledge sharing, and critical reflection. Students are expected to post and respond to prompts, supporting a collaborative online learning environment.
* **Project-Based Assessments**: Students will complete individual or team-based projects that require the application of course concepts to realistic scenarios. These projects are scaffolded throughout the term to support deeper learning. The first three people to send me a Canvas Inbox message by September 1, with the subject silver monkey, will be given a free 5 bonus points (excludes projects and final week assignments).
* **Live Chat Sessions**: Optional real-time chat sessions can be scheduled periodically to provide additional support, clarify course content, and foster a sense of community. Participation is encouraged but not required due to the asynchronous nature of the course.
* **Canvas Tools**: All course content, announcements, deadlines, and communications will be managed through Canvas. Modules are released on a weekly basis, and students are expected to follow the schedule for maximum success.

This methodology is intended to provide a balance of flexibility, autonomy, and meaningful interaction to support learning in a fully online environment.

**16.** **FERPA: \***

Students need to understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17. DISABILITIES:\***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431, X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires an accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.