I. CATALOG INFORMATION
   A. Discipline: MATHEMATICS
   B. Subject Code and Number: MATH M10
   C. Course Title: Mathematics for Elementary Teachers
   D. Credit Course units:
       Units: 3
       Lecture Hours per week: 3
       Lab Hours per week: 0
       Variable Units: No
   E. Student Learning Hours:
       Lecture Hours:
       Classroom hours: 52.5 - 52.5
       Laboratory/Activity Hours:
       Laboratory/Activity Hours 0 - 0
       **Total Combined Hours** in a 17.5 week term: 52.5 - 52.5
   F. Non-Credit Course hours per week 
   G. May be taken a total of:  X 1 2 3 4 time(s) for credit
   H. Is the course co-designated (same as) another course: No  X  Yes 
      If YES, designate course Subject Code & Number: 
   I. Course Description:
      Focuses on the development of quantitative reasoning skills through in-depth, integrated explorations of topics in mathematics, including real numbers systems and subsystems. Emphasizes the comprehension and analysis of mathematical concepts and applications of logical reasoning.
   J. Entrance Skills
      *Prerequisite:  No  X  Yes  Course(s)
      MATH M03 or MATH M03B or placement as determined by the college's multiple measures assessment process.
      *Corequisite:  No  X  Yes  Course(s)
      Limitation on Enrollment:  No  X  Yes  
      Recommended Preparation:  No  X  Yes  Course(s)
      Other:  No  X  Yes  

### K. Other Catalog Information:

Designed for students intending to teach in K-8. Not recommended for majors in physical sciences or mathematics.

C-ID: MATH 120

### II. COURSE OBJECTIVES

Upon successful completion of the course, a student will be able to:

<table>
<thead>
<tr>
<th></th>
<th>Methods of evaluation will be consistent with, but not limited by, the following types or examples.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>write numbers in Hindu-Arabic, Babylonian, Roman and other numeration systems.</td>
</tr>
<tr>
<td></td>
<td>Graded homework Projects Exams</td>
</tr>
<tr>
<td>2</td>
<td>convert numbers from base ten into place value systems in other bases and perform basic arithmetic operations in bases other than ten.</td>
</tr>
<tr>
<td></td>
<td>Graded homework Projects Exams</td>
</tr>
<tr>
<td>3</td>
<td>define addition and subtraction of integers and state the properties of addition and subtraction.</td>
</tr>
<tr>
<td></td>
<td>Graded homework Projects Exams</td>
</tr>
<tr>
<td>4</td>
<td>define multiplication and division of integers and state the properties of multiplication and division.</td>
</tr>
<tr>
<td></td>
<td>Graded homework Projects Exams</td>
</tr>
<tr>
<td>5</td>
<td>evaluate the equivalence of numeric algorithms and explain the advantages and disadvantages of equivalent algorithms in different circumstances.</td>
</tr>
<tr>
<td></td>
<td>Graded homework Projects Exams</td>
</tr>
<tr>
<td>6</td>
<td>apply algorithms from number theory to determine divisibility in a variety of settings.</td>
</tr>
<tr>
<td></td>
<td>Graded homework Projects Exams</td>
</tr>
<tr>
<td>7</td>
<td>define prime and composite numbers and factor a composite into primes.</td>
</tr>
<tr>
<td></td>
<td>Graded homework Projects Exams</td>
</tr>
<tr>
<td>8</td>
<td>determine the greatest common divisors and least common multiples of sets of numbers and explain their role in standard algorithms.</td>
</tr>
<tr>
<td></td>
<td>Graded homework Projects Exams</td>
</tr>
</tbody>
</table>
| 9 | define the set of rational numbers using both ratio and decimal representations; analyze the arithmetic algorithms for these two representations and justify their equivalence. | Graded homework
Projects
Exams |
|---|---|---|
| 10 | define the set of real numbers and state the properties of real numbers. | Graded homework
Projects
Exams |
| 11 | analyze the structure and properties of whole, rational, and real number systems; define rational and irrational numbers, including their decimal representation and illustrate the use of a number line representation. | Graded homework
Projects
Exams |
| 12 | define rates, ratios and proportions and use ratios and proportions to solve real life problems. | Graded homework
Projects
Exams |
| 13 | define percentages and use percents to solve problems. | Graded homework
Projects
Exams |
| 14 | use patterns, problem solving, communication, connections, modeling, reasoning, and representation to reinforce conceptual understanding of mathematical topics. | Graded homework
Projects
Exams |
| 15 | develop activities implementing national, state and Common Core curriculum standards. | Graded homework
Projects
Exams |

### III. COURSE CONTENT

<table>
<thead>
<tr>
<th>Estimated %</th>
<th>Topic</th>
<th>Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lecture</strong> (must total 100%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 20.00% | Numeration Systems  
1. The history of numeration systems  
2. Hindu-Arabic numeration system  
3. Place value systems  
4. Basic arithmetic in other bases | 1, 2 |
| 20.00% | Integers and Number Theory  
1. Basic properties of integers and computational algorithms  
2. Divisibility  
3. Prime and composite numbers  
4. Prime factorization  
5. Greatest common divisor and least common multiple  
6. The fundamental theorem of arithmetic | 3, 4, 5, 6, 7, 8 |
|  | Rational Numbers  
1. The set of rational numbers and its properties | |
### Course Outline - MATH M10

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Topics</th>
</tr>
</thead>
</table>
| 20.00%     | 2. Addition and subtraction of rational numbers  
3. Multiplication and division of rational numbers |
| 15.00%     | Real Numbers  
1. The set of real numbers  
2. Properties of real numbers  
3. Rational and irrational numbers  
4. Arithmetic operations, decimal representation, and number line representation |
| 10.00%     | Proportional Reasoning  
1. Rates and ratios  
2. Using proportions  
3. Using percents |
| 5.00%      | Curriculum Standards for Elementary School Mathematics  
1. National curriculum standards  
2. State curriculum standards  
3. Common Core state standards |
| 10.00%     | Problem Solving  
1. Patterns and connections  
2. Mathematical reasoning  
3. Communication of mathematical concepts  
4. Modeling and representation |

### IV. TYPICAL ASSIGNMENTS

**A. Writing assignments**

Writing assignments are required. Possible assignments may include, but are not limited to:

| 1 | complete homework problems selected from the math for elementary teachers textbook where answers require a written explanation of the solution, such as find the greatest common factor and least common multiple of sets of numbers. |
| 2 | complete graded assignments: in-class and/or homework assignments requiring complete solutions using both written English and symbolic mathematical language, such as solving an application problem using Polya's Four Step Strategy. |
| 3 | write solutions to short answer problems on exams, such as stating the solution of a ratio and proportion problem. |

**B. Appropriate outside assignments**

Appropriate outside assignments are required. Possible assignments may include, but are not limited to:

| 1 | complete assigned reading material and homework problems from the math for elementary teachers textbook, such as solving problems using Venn diagrams. |
| 2 | complete additional problem sets provided by the instructor, such as practice converting numbers from base ten into other bases. |
| 3 | complete graded problem solving assignments, such as checking numbers for divisibility. |
| 4 | complete group or individual projects, such as students participating in a card game activity to practice ordering fractions. |
V. METHODS OF INSTRUCTION

Methods of instruction may include, but are not limited to:

☐ Distance Education – When any portion of class contact hours is replaced by distance education delivery mode (Complete DE Addendum, Section XV)

☒ Lecture/Discussion

☐ Laboratory/Activity

☒ Other (Specify)
Introductory lectures to new concepts; review material from previous topics as related to the current topic; provide detailed step-by-step examples; provide practice problems to develop proper mathematical skills and techniques; provide student interaction for questions and answers; use projects and/or group work to enhance student understanding of the concepts; and discuss application problems, such as using percentages to solve increasing and decreasing population problems.

☐ Optional Field Trips

☐ Required Field Trips

VI. METHODS OF EVALUATION

Methods of evaluation may include, but are not limited to:

☐ Essay Exam

☒ Problem Solving Exam

☒ Objective Exams

☒ Classroom Discussion

☒ Reports/Papers/Projects

☐ Skill Demonstration

☐ Participation

☒ Other (specify)

Quizzes and/or graded work will be used to evaluate students for the critical thinking skills needed to solve math problems.
Problems must require students to demonstrate analytic skills and the step-by-step details required for the solution, such as using a factor sieve to find prime
and composite numbers.

VII. REPRESENTATIVE TEXTS AND OTHER COURSE MATERIALS


VIII. STUDENT MATERIALS FEES

[ ] No  [ ] Yes

IX. PARALLEL COURSES

<table>
<thead>
<tr>
<th>College</th>
<th>Course Number</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of the Canyons</td>
<td>MATH 130</td>
<td>Elementary Teachers</td>
<td>3</td>
</tr>
<tr>
<td>San Jose State University</td>
<td>MATH 102</td>
<td>Secondary School Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>Sierra College</td>
<td>MATH 0019</td>
<td>Mathematical Concepts for Elementary School Teachers</td>
<td>3</td>
</tr>
<tr>
<td>CSU Channel Islands</td>
<td>MATH 208</td>
<td>Modern Math for Elementary Teaching I – Numbers and Problem Solving</td>
<td>3</td>
</tr>
<tr>
<td>UC San Diego</td>
<td>MATH 95</td>
<td>Introduction to Teaching Math</td>
<td>2</td>
</tr>
</tbody>
</table>

X. MINIMUM QUALIFICATIONS

Courses Requiring a Masters Degree:
Master’s degree in mathematics or applied mathematics OR bachelor’s degree in either of the above AND master's degree in statistics, physics, or mathematics education OR the equivalent.

XI. ARTICULATION INFORMATION

A. Title V Course Classification:

1. This course is designed to be taken either:

[ ] Pass/No Pass only (no letter grade possible); or
[ ] X Letter grade (P/NP possible at student option)

2. Degree status:

Either [ ] Associate Degree Applicable; or [ ] Non-associate Degree Applicable

B. Moorpark College General Education:

1. Do you recommend this course for inclusion on the Associate Degree General Education list?

Yes: [ ] No: [ ] If YES, what section(s)?

[ ] A1 - Natural Sciences - Biological Science
[ ] A2 - Natural Sciences - Physical Science
[ ] B1 - Social and Behavioral Sciences - American History/Institutions

[ ]
B2 - Social and Behavioral Sciences - Other Social Behavioral Science
C1 - Humanities - Fine or Performing Arts
C2 - Humanities - Other Humanities
D1 - Language and Rationality - English Composition
D2 - Language and Rationality - Communication and Analytical Thinking
E1 - Health/Physical Education
E2 - PE or Dance
F - Ethnic/Gender Studies

C. California State University (CSU) Articulation:

1. Do you recommend this course for transfer credit to CSU? Yes: [X] No:

2. If YES do you recommend this course for inclusion on the CSU General Education list? Yes: [X] No: [ ] If YES, which area(s)?

   C1 [ ] C2 [ ] D1 [ ] D2 [ ] D3 [ ] D4 [ ] D5 [ ]
   D6 [ ] D7 [ ] D8 [ ] D9 [ ] D10 [ ] E [ ]

D. University of California (UC) Articulation:

1. Do you recommend this course for transfer to the UC? Yes: [X] No: [ ]

2. If YES do you recommend this course for the Intersegmental General Education Transfer Curriculum (IGETC)? Yes: [ ] No: [X]

   IGETC Area 1: English Communication
   [ ] English Composition
   [ ] Critical Thinking-English Composition
   [ ] Oral Communication

   IGETC Area 2: Mathematical Concepts and Quantitative Reasoning
   [ ] Mathematical Concepts

   IGETC Area 3: Arts and Humanities
   [ ] Arts
   [ ] Humanities

   IGETC Area 4: Social and Behavioral Sciences
   [ ] Anthropology and Archaeology
   [ ] Economics
   [ ] Ethnic Studies
IGETC Area 5: Physical and Biological Sciences (mark all that apply)

- Physical Science Lab or Physical Science Lab only (non-sequence)
- Physical Science Lecture only (non-sequence)
- Biological Science
- Physical Science Courses
- Physical Science Lab or Biological Science Lab Only (non-sequence)
- Biological Science Courses
- Biological Science Lab course
- First Science course in a Special sequence
- Second Science course in a Special Sequence
- Laboratory Activity
- Physical Sciences

IGETC Area 6: Language other than English

- Languages other than English (UC Requirement Only)
- U.S. History, Constitution, and American Ideals (CSU Requirement ONLY)
- U.S. History, Constitution, and American Ideals (CSU Requirement ONLY)

XII. REVIEW OF LIBRARY RESOURCES

A. What planned assignment(s) will require library resources and use?

The following assignments require library resources:

Research papers and projects, using as sources material from the Library's print and online resources, on topics related to the teaching of mathematics to elementary school students, such as researching polygons and three-dimensional figures to write a report and present to the class.

B. Are the currently held library resources sufficient to support the course assignment?

YES: [X] NO: 

If NO, please list additional library resources needed to support this course.

XIII. PREREQUISITE AND/OR COREQUISITE JUSTIFICATION

Requisite Justification for MATH M03
A. Sequential course within a discipline.

B. Standard Prerequisite or Corequisite required by universities.
   CSU Stanislaus ; Cal-Poly Pomona ; CSU San Bernardino

C. Corequisite is linked to companion lecture course.

D. Prerequisite or Corequisite is authorized by legal statute or regulation.
   Code Section: _________

E. Prerequisite or Corequisite is necessary to protect the students' health and safety.

F. Computation or communication skill is needed.

G. Performance courses: Audition, portfolio, tryouts, etc. needed.

or

Requisite Justification for MATH M03B

A. Sequential course within a discipline.

B. Standard Prerequisite or Corequisite required by universities.
   CSU Stanislaus ; Cal-Poly Pomona ; CSU San Bernardino

C. Corequisite is linked to companion lecture course.

D. Prerequisite or Corequisite is authorized by legal statute or regulation.
   Code Section: _________

E. Prerequisite or Corequisite is necessary to protect the students' health and safety.

F. Computation or communication skill is needed.

G. Performance courses: Audition, portfolio, tryouts, etc. needed.

or
Requisite Justification for placement as determined by the college's multiple measures assessment process.

- [ ] A. Sequential course within a discipline.
- [ ] B. Standard Prerequisite or Corequisite required by universities.
- [ ] C. Corequisite is linked to companion lecture course.
- [ ] D. Prerequisite or Corequisite is authorized by legal statute or regulation.
  Code Section: _________
- [ ] E. Prerequisite or Corequisite is necessary to protect the students' health and safety.
- [x] F. Computation or communication skill is needed.
- [ ] G. Performance courses: Audition, portfolio, tryouts, etc. needed.

XIV. WORKPLACE PREPARATION
MATH M10: Not Applicable

XV. DISTANCE LEARNING COURSE OUTLINE ADDENDUM
MATH M10: Not Applicable

XVI. GENERAL EDUCATION COURSE OUTLINE ADDENDUM

General Education Division of Learning [check all applicable boxes]:

- [ ] Natural Sciences
  - [ ] Biological Science
  - [ ] Physical Science
- [ ] Social and Behavioral Sciences
  - [ ] American History/Institutions
  - [ ] Other Social Science
- [ ] Humanities
  - [ ] Fine or Performing Arts
  - [ ] Other Humanities
- [x] Language and Rationality
  - [ ] English Composition
  - [x] Communication and Analytical Thinking
Check either Option 1 or Option 2

☑ OPTION #1: Moorpark College has already received approval from the CSU and/or UC systems for this course to fulfill a GE requirement. Note: This option applies only to technical revisions and updated courses.

☐ OPTION #2: Moorpark College has not received approval from the CSU and/or UC systems for this course to fulfill a GE requirement. This option applies to all new and substantively revised courses.

XVII. STUDENT MATERIALS FEE ADDENDUM
MATH M10: Not Applicable

XVIII. REPEATABILITY JUSTIFICATION TITLE 5, SECTION 55041
MATH M10: Not Applicable

XIX. CURRICULUM APPROVAL
Course Information:
Discipline: MATHEMATICS
Discipline Code and Number: MATH M10
Course Revision Category: Outline Update

Course Proposed By:
Originating Faculty: Doreen Butler 10/12/2017
Faculty Peer: Claudia Gutierrez 10/16/2017
Curriculum Rep: Daniel Rubinstein 10/18/2017
Department Chair: Phillip Abramoff 10/16/2017
Division Dean: Mary Rees 10/16/2017

Approved By:
Curriculum Chair: Jerry Mansfield 04/23/2018
Executive Vice President: 
Articulation Officer: Jodi Dickey 04/03/2018
Librarian: Mary LaBarge 04/04/2018

Implementation Term and Year: Fall 2018

Approval Dates:
Approved by Moorpark College Curriculum Committee: 04/17/2018
Approved by Board of Trustees (if applicable): 
Approved by State (if applicable): 04/25/2018