**ED 322-01-1: Elementary Math Methods I**
**School of Education & Behavioral Sciences**
**Fall 2020 / 3 Credits**
**Brogan Hall 101**
**Tuesday & Thursday 2:40 – 4:10 pm**


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| **Instructor:** | Dr. Travis Mukina | **Office Location:** | Brogan 132 |
| **Email:** | travis.mukina@chaminade.edu | **Office Hours:** | By Appointment |
| **Office Phone:** | (808) 440-4250 | **Cell Phone:** | (814) 450-8134 |


**Learning Materials:**

- **Textbook**: J.A. Van DeWalle, K. Kary, J.M. Bay-Williams (2016). Elementary and Middle School Mathematics: Teaching Developmentally. 10th ed. Pearson. ISBN: 9780134802084
- **GroupMe App**: A way to stay up-to-date with all class routines, assignments, and questions between you, your professor, and your classmates.
- **Computer Folder/Google Drive/3-Ring Binder**: This should be comprised of provided handouts, class activities, and all assignments.

**Additional Resources:**

- Common Core State Standards for Mathematics:
  - http://www.corestandards.org/wp-content/uploads/Math_Standards1.pdf
- Suggested Mathematical Research Articles [provided in each chapter]

**Essential Question(s):**

1. What are the qualities needed to learn and grow as a professional teacher of mathematics?
2. What does it mean to do mathematics?
3. Which teaching practices related to problem solving support mathematical learning for all students?

**Course Catalog Description:**
This course provides an overview and applications of best practice mathematics instructional approaches, strategies, techniques, and assessment methods. Math concepts for students in kindergarten through grade 3 are explored using hands-on and problem-solving approaches.
*Required*: 8 hours of O&P
*Prerequisite*: Pass Praxis I or 9 hours of math credit, ED 220, ED 221, ED 322

**Mission Statement:**
The mission of the education division is to foster the education of teachers and leaders in education through programs based in the liberal arts tradition, Catholic Marianist's values, current research, and best practices.

**Marianist Values:**
1. Educate for Formation in Faith
2. Provide an Integral Quality Education
3. Educate in Family Spirit
4. Educate for Service, Justice, and Peace
5. Educate for Adaptation and Change

**WASC Core Competencies:**
1. Written Communication
2. Oral Communication
3. Quantitative Reasoning
4. Critical Thinking
5. Information Literacy

## Program Learning Outcomes (PLOs):

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| **1** | **Content Knowledge** - Knowledge of subject matter such as reading/language, arts, mathematics, social sciences, science, visual arts, musical arts, and kinesthetic arts. |
| **2** | **Developmentally Appropriate Practice** - Knowledge of how students develop and learn, and engagement of students in developmentally appropriate experiences that support learning. |
| **3** | **Pedagogical Content Knowledge** - Knowledge of how to teach subject matter to students and application of a variety of instructional strategies that are rigorous, differentiated, focused on the active involvement of the learner. |
| **4** | **Educational Technology** - Knowledge of and application of appropriate technology for student learning. |
| **5** | **Assessment for Learning** - Knowledge of and use of appropriate assessment strategies that enhance the knowledge of learners and their responsibility for their own learning. |
| **6** | **Diversity** - Skills for adapting learning activities for individual differences and the needs of diverse learners and for maintaining safe positive, caring, and inclusive learning environments. |
| **7** | **Focus on Student Learning** - Skills in the planning and design of meaningful learning activities that support and have positive impact on student learning based upon knowledge of subject matter, students, the community, curriculum standards, and integration of appropriate technology. |
| **8** | **Professional & Ethical Dispositions and Communication** - Professional dispositions, professionalism in teaching, and ethical standards of conduct consistent with Marianist values, and positive and constructive relationships with parents, the school community and professional colleagues. |

## Course Learning Outcomes (CLOs):

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| **1** | Engage in problem solving, reasoning and proof, communications, connections, and representation. |
| **2** | Plan lessons that teach upper elementary students:<br>1. To understand and use the major concepts and procedures that define number and operations, algebra, geometry, measurement, and data analysis and probability.<br>2. To explore, conjecture and reason logically; to solve non-routine problems; to communicate about and through mathematics; and to connect ideas within and between mathematics and other intellectual activity. |
| **3** | Know what mathematical preconceptions, misconceptions, and error patterns to look for in upper elementary student work as a basis to improve understanding and construct appropriate learning experiences and assessments. |
| **4** | Use a variety of manipulatives, calculators, computer programs, and other appropriate technology to investigate and explain mathematics. |

## Alignment of Learning Outcomes:

| | **CLO 1** | **CLO 2** | **CLO 3** | **CLO 4** |
|---|---|---|---|---|
| **Marianist Values** | -Provide an integral and quality education | -Provide an integral and quality education<br>-Educate for adaptation and change | -Provide an integral and quality education<br>-Educate for adaptation and change | -Provide an integral and quality education<br>-Educate for adaptation and change |
| **WASC Core Competencies** | -Written Communication<br>-Oral Communication<br>-Quantitative Reasoning<br>-Critical Thinking | -Written Communication<br>-Oral Communication<br>-Quantitative Reasoning<br>-Critical Thinking | -Quantitative Reasoning<br>-Oral Communication<br>-Critical Thinking | -Quantitative Reasoning<br>-Oral Communication<br>-Critical Thinking |
| **Program Outcomes** | 1, 2, 3, 4, 6, 7 | 1, 2, 3, 4, 5, 6, 7 | 1, 3, 4, 5, 6, 7 | 1, 2, 3, 4, 6, 7 |
| **Essential ?'s** | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 |

**Assessment:**
The assignments described below are each designed to contribute in a different and significant way to your knowledge and experience relative to diagnosis and remediation of mathematics, and to teaching elementary mathematics. Always be prepared to effectively participate to class discussions, analyze the thinking of others in class, and clearly explain your thinking in every assignment. It will be your responsibility to turn in all assignments on time, as late assignments are not accepted. Feedback and grades on all assignments are provided within 2 days of submission.

**1. Class Participation – 10% of Final Grade**
*Due: Ongoing evaluation by instructor throughout the semester*
*1: Low Participation 2: Majority Participation 3: Full Participation*
Your cooperation and active participation are necessary to facilitate this course synchronously and asynchronously, including being actively involved in the class GroupMe app. If you are unable to attend synchronous classes, it is your responsibility to notify your instructor before the start of class and find out from a classmate what you missed. However, you also have a responsibility to be responsive and participate fully in all asynchronous activities. It is important that you listen to the ideas of others and respect their thoughts. Your grade will be determined based a holistic evaluation of your professionalism and participation.

**2. Problem-Solving Sets – 20% of Final Grade**
*Due: After the Completion of Chapters 8 – 12*
*10 points each*
After Chapters 8 – 12, you are required to complete 5 questions from the topics covered in those chapters using strategies that elementary level students might use to complete them. These questions require detailed explanation of thought processes and, sometimes, mathematical drawings to show ideas. These assignments are designed to prepare you for understanding how to teach problems conceptually while using multiple strategies. All problem-solving sets must be submitted on Canvas in a PDF format.

**3. Chapters 1 – 5 and 7 – 12 Reflections– 15% of Final Grade**
*Due: After the Completion of Chapters 1 – 5 and 7 – 12*
*5 points each*
Chapter reflections are required after reading Chapters 1 – 5 and 7 – 12 in the textbook. Information on methods to complete the reflections can be found on Canvas. Your reflections must be submitted on Canvas in a PDF format.

**4. Three-Act Task & Presentation – 30% of Final Grade**
*First Submission Due: End of Week 6*
*Second Submission Due: End of Week 11*
*Final Submission Due: Finals Week*
*45 points*
Your Three-Act Task must focus on one of the content areas covered in this course. The task can involve any specific content covered in this course. Task information, templates, and the scoring rubric are on Canvas. You will submit pieces of the task for feedback before you submit the full, completed task at the end of the course.

**5. O&P Assignments – 25% of Final Grade**
*Due: Randomly throughout the semester*
*10 points each*
You have five assignments to complete during your Observation & Participation time in the classroom you are assigned to this semester. Several of the assignments involve communication between yourself and your mentor teacher. Please ensure your mentor teacher that if they have questions about the assignments they can contact me at any time. A summary of each assignment is provided on Canvas.

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

**Kokua Ike Tutoring Center:**
Kokua Ike provides access to free one-on-one tutoring for undergraduate students. The tutoring services are designed to guide students to the point at which they become independent learners, no longer needing a tutor. Subjects tutored include, but are not limited to: Biology, Mathematics, Nursing, English, etc. The tutoring center consists of trained Peer and Professional Tutors.

- In order to receive tutoring, a student must visit the Student Support Services building and complete a brief contract prior to receiving services.
- After submitting the form, a staff member will assist you in creating an online account that allows you to book an appointment through the online system.
- Hours of Operation: Monday – Friday 8:30 am – 4:30 pm
- Want to become a tutor? Ask me how!

**Course Attendance Policy:**
As stated in the Chaminade University Catalog, students are expected to attend all classes for courses in which they are registered. Students must follow the attendance policy as stipulated in the syllabus of Education Division courses. Penalties for not meeting the attendance requirements may result in lowering of the grade, withdrawal from the course, or failing the course.

**1. Excused Absences.**

*1.1.* Since it is expected that students will participate in all class sessions, excused absences are only granted in exceptional situations where evidence is provided by the student to the instructor. Examples would include illness (with verification by a doctor) or the death of a close family member. Students should notify their instructors when a situation prevents them from attending class and make arrangements to complete missed assignments. *While notification of the instructor by a student that he/she will be absent is courteous, it does not necessarily mean the absence will be excused.*

*1.2.* In cases where excused absences constitute a significant portion of a course's meetings (e.g., more than 20% of on-ground course meetings, or a significant portion of online or hybrid courses), the instructor should refer the case to the Dean with a recommendation on how the case should be handled (e.g., withdrawal or incomplete).

**2. Unexcused Absences.** Chaminade University policy states that in cases where unexcused absences are equivalent to more than a week of classes the instructor has the option of lowering the grade. In the Education Division, we have added detailed guidelines to cover different types of courses and class schedules:

*2.1.* On-Ground courses: Missing more than 2 weeks of class (6 classes) will result in an automatic lowering of one letter grade after final grade is calculated.

*2.2.* Online courses and online portion of hybrid courses: The instructor will specify and enforce expectations for online participation and receipt of assignments appropriate to the design of the course. For online/hybrid courses failure to log in for one week is equivalent to an absence in a traditional on-ground course. Two weeks of not logging in constitutes grounds for removal of the student from the course.

**3. Additional Notes.**

*3.1.* If a student does not logon to an online or hybrid course for the first two weeks, the instructor should notify the Dean and the student will be withdrawn from the course.

*3.2.* Any student who stops attending an on-ground course or stops participating in an online course without officially withdrawing may receive a failing grade.

## University Policies

**Academic Honesty Statement:** Violations of the Honor Code are serious. They harm other students, your professor, and the integrity of the University. Alleged violations will be referred to the Office of Judicial Affairs. If found guilty of plagiarism, a student might receive a range of penalties, including failure of an assignment, failure of an assignment and withholding of the final course grade until a paper is turned in on the topic of plagiarism, failure of the course, or suspension from the University.

Violations of Academic Integrity: Violations of the principle include, but are not limited to:

- Cheating: Intentionally using or attempting to use unauthorized materials, information, notes, study aids, or other devices in any academic exercise.
- Fabrication and Falsification: Intentional and unauthorized alteration or invention of any information or citation in an academic exercise. Falsification is a matter of inventing or counterfeiting information for use in any academic exercise.
- Multiple Submissions: The submission of substantial portions of the same academic work for credit (including oral reports) more than once without authorization.
- Plagiarism: Intentionally or knowingly presenting the work of another as one's own (i.e., without proper acknowledgment of the source).
- Abuse of Academic Materials: Intentionally or knowingly destroying, stealing, or making inaccessible library or other academic resource materials.
  Complicity in Academic Dishonesty: Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.

Plagiarism includes, but is not limited to:

- Copying or borrowing liberally from someone else's work without his/her knowledge or permission; or with his/her knowledge or permission and turning it in as your own work.
- Copying of someone else's exam or paper.
- Allowing someone to turn in your work as his or her own.
- Not providing adequate references for cited work.
- Copying and pasting large quotes or passages without properly citing them.

**Title IX Compliance:** Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. If you or someone you know has been harassed or assaulted, you can find the appropriate resources by visiting Campus Ministry, the Dean of Students Office, the Counseling Center, or the Office for Compliance and Personnel Services.

**Disability Access:** If you need individual accommodations to meet course outcomes because of a documented disability, please speak with me to discuss your needs as soon as possible so that we can ensure your full participation in class and fair assessment of your work. Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from the Counseling Center by the end of week three of the class, in order for instructors to plan accordingly. If a student would like to determine if they meet the criteria for accommodations, they should contact the Kokua Ike Coordinator at (808) 739-8305 for further information (ada@chaminade.edu).

# Course Outline (Fall 2020)

***The professor reserves the right to make adjustments to this outline to better accommodate student needs.**

| Blue Group (A) | Silver Group (B) | Everyone (Online) |
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| **Week #**<br>Date | **Class Description**<br>[Assigned readings completed BEFORE class] | **Assignments Due by Midnight** |
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| **Week 1**<br>August 25th | Introduction to Course & Syllabus<br><br>Chapter 1: Teaching Mathematics in the 21st Century<br>[Pages 1 – 12]<br><br>*Suggested Research Article*:<br>• "Improving The Planning & Teaching of Mathematics by Reflecting on Research" by Hoffman & Brahier | August 25th<br>• GroupMe App Confirmation |
| **Week 1**<br>August 27th | Introduction to Course & Syllabus<br><br>Chapter 1: Teaching Mathematics in the 21st Century<br>[Pages 1 – 12]<br><br>*Suggested Research Article*:<br>• "Improving The Planning & Teaching of Mathematics by Reflecting on Research" by Hoffman & Brahier | August 28th<br>• Chapter 1 Reflection |
| **Week 2**<br>September 1st | Chapter 2: Exploring What It Means to Know and Do Mathematics<br>[Pages 13 – 29]<br><br>*Suggested Research Article*:<br>• "Relational Understanding and Instrumental Understanding" by Skemp | |
| **Week 2**<br>September 3rd | Chapter 2: Exploring What It Means to Know and Do Mathematics<br>[Pages 13 – 29]<br><br>*Suggested Research Article*:<br>• "Relational Understanding and Instrumental Understanding" by Skemp | September 4th<br>• Chapter 2 Reflection |
| **Week 3**<br>September 8th | Chapter 3: Teaching through Problem Solving<br>Chapter 4: Planning in the Problem-Based Classroom<br>[Pages 30 – 54] & [Pages 55 – 82]<br><br>*Suggested Research Articles*:<br>• "Fostering Mathematical Thinking and Problem Solving: The Teacher's Role" by Rigelman<br>• "Preparing for Problem Solving" by Holden | |
| **Week 3**<br>September 10th | Chapter 3: Teaching through Problem Solving<br>Chapter 4: Planning in the Problem-Based Classroom<br>[Pages 30 – 54] & [Pages 55 – 82]<br><br>*Suggested Research Articles*:<br>• "Fostering Mathematical Thinking and Problem Solving: The Teacher's Role" by Rigelman<br>• "Preparing for Problem Solving" by Holden | September 11th<br>• Chapter 3 Reflection<br><br>• Chapter 4 Reflection |

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| **Week 4**<br>September 15th | Chapter 5: Creating Assessments *for* Learning<br>[Pages 83 – 102]<br><br>Three-Act Task Information | |
| **Week 4**<br>September 17th | Chapter 5: Creating Assessments *for* Learning<br>[Pages 83 – 102]<br><br>Three-Act Task Information | September 18th<br>• Chapter 5 Reflection<br><br>• Three-Act Task Information & Understanding |
| **Week 5**<br>September 22nd | Chapter 7: Developing Early Number Concepts and Number Sense<br>[Pages 125 – 152]<br><br>*Suggested Research Article*:<br>• "Number Concepts and Special Needs Students: The Power of Ten-Frame Tiles" by Losq<br><br>*Number Talks Discussion:* Ten Frames: 8 + 6 | |
| **Week 5**<br>September 24th | Chapter 7: Developing Early Number Concepts and Number Sense<br>[Pages 125 – 152]<br><br>*Suggested Research Article*:<br>• "Number Concepts and Special Needs Students: The Power of Ten-Frame Tiles" by Losq<br><br>*Number Talks Discussion:* Ten Frames: 8 + 6 | September 25th<br>• Chapter 7 Reflection |
| **Week 6**<br>September 29th | Chapter 8: Developing Meanings for the Operations<br>[Pages 153 – 182]<br><br>*Suggested Research Article*:<br>• "A Problem-Solving Alternative to Using Key Words" by Clement & Bernhard | |
| **Week 6**<br>October 1st | Chapter 8: Developing Meanings for the Operations<br>[Pages 153 – 182]<br><br>*Suggested Research Article*:<br>• "A Problem-Solving Alternative to Using Key Words" by Clement & Bernhard | October 2nd<br>• First Submission of Three-Act Task |
| **Week 7**<br>October 6th | Chapter 8: Developing Meanings for the Operations<br>[Pages 153 – 182]<br><br>*Number Talks Discussion:* Array Discussion: 8 x 25 | |
| **Week 7**<br>October 8th | Chapter 8: Developing Meanings for the Operations<br>[Pages 153 – 182]<br><br>*Number Talks Discussion:* Array Discussion: 8 x 25 | October 9th<br>• Chapter 8 Reflection<br><br>• Problem-Solving Set (Chap. 8)<br><br>• ~~O&P Placement Confirmation Email~~ |
| **Week 8**<br>October 13th | Chapter 9: Developing Basic Fact Fluency<br>[Pages 183 – 210] | |

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| | *Suggested Research Article*:<br>• "Research Suggests that Timed Tests Cause Math Anxiety" by Boaler | |
| **Week 8**<br>October 15th | Chapter 9: Developing Basic Fact Fluency<br>[Pages 183 – 210]<br><br>*Suggested Research Article*:<br>• "Research Suggests that Timed Tests Cause Math Anxiety" by Boaler | |
| **Week 9**<br>October 20th | Chapter 9: Developing Basic Fact Fluency<br>[Pages 183 – 210]<br><br>*Number Talks Discussion*: Multiplication String: 7 x 7 | |
| **Week 9**<br>October 22nd | Chapter 9: Developing Basic Fact Fluency<br>[Pages 183 – 210]<br><br>*Number Talks Discussion*: Multiplication String: 7 x 7 | October 23rd<br>• Chapter 9 Reflection<br><br>• Problem-Solving Set (Chap. 9)<br><br>• O&P Observation Reflection |
| **Week 10**<br>October 27th | Chapter 10: Developing Whole-Number Place-Value Concepts<br>[Pages 211 – 237]<br><br>*Suggested Research Article*:<br>• "Opportunities to Develop Place Value through Student Dialogue" by Kari & Anderson | |
| **Week 10**<br>October 29th | Chapter 10: Developing Whole-Number Place-Value Concepts<br>[Pages 211 – 237]<br><br>*Suggested Research Article*:<br>• "Opportunities to Develop Place Value through Student Dialogue" by Kari & Anderson | October 30th<br>• Chapter 10 Reflection<br><br>• Problem-Solving Set (Chap. 10) |
| **Week 11**<br>November 3rd | Chapter 11: Developing Strategies for Addition and Subtraction Computation<br>[Pages 238 – 272]<br><br>*Number Talks Discussion*: Addition: 38 + 37 | |
| **Week 11**<br>November 5th | Chapter 11: Developing Strategies for Addition and Subtraction Computation<br>[Pages 238 – 272]<br><br>*Number Talks Discussion*: Addition: 38 + 37 | November 6th<br>• Second Submission of Three-Act Task<br><br>• O&P Small Group Reflection |
| **Week 12**<br>November 10th | Chapter 11: Developing Strategies for Addition and Subtraction Computation<br>[Pages 238 – 272]<br><br>*Suggested Research Article*:<br>• "Using Research to Develop Computational Fluency in Young Mathematicians" by O'Loughlin | |

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| | *Number Talks Discussion*: Subtraction: 70 - 59 | |
| **Week 12**<br>November 12th | Chapter 11: Developing Strategies for Addition and Subtraction Computation<br>[Pages 238 – 272]<br><br>*Suggested Research Article*:<br>• "Using Research to Develop Computational Fluency in Young Mathematicians" by O'Loughlin<br><br>*Number Talks Discussion*: Subtraction: 70 - 59 | November 13th<br>• Chapter 11 Reflection<br><br>• Problem-Solving Set (Chap. 11) |
| **Week 13**<br>November 17th | Chapter 12: Developing Strategies for Multiplication and Division Computation<br>[Pages 273 – 298]<br><br>*Number Talks Discussion*: Multiplication: 32 x 15 | |
| **Week 13**<br>November 19th | Chapter 12: Developing Strategies for Multiplication and Division Computation<br>[Pages 273 – 298]<br><br>*Number Talks Discussion*: Multiplication: 32 x 15 | |
| **Week 14**<br>November 24th | Chapter 12: Developing Strategies for Multiplication and Division Computation<br>[Pages 273 – 298]<br><br>*Suggested Research Article*:<br>• "The Distributive Property in Grade 3?" by Benson, Wall, & Malm<br><br>*Number Talks Discussion*: Division String: 496 ÷ 8 | November 24th<br>• Chapter 12 Reflection<br><br>• Problem-Solving Set (Chap. 12)<br><br>• O&P Teaching Reflection<br><br>• ~~O&P Completed Time Sheet~~ |
| **Week 14**<br>November 26th | **THANKSGIVING BREAK** | **NO CLASS** |
| **Week 15**<br>December 1st | Presentation of Three-Act Tasks | |
| **Week 15**<br>December 3rd | Presentation of Three-Act Tasks | |
| **Finals Week**<br>December 7th | | December 7th<br>• Final Submission of Three-Act Task & Presentation |