**EDUC 614-90-3: Elementary Math Methods**
**School of Education & Behavioral Sciences**
Chaminade University Honolulu
**Fall 2022 / 3 Credits**
**Online**


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**Learning Materials:**

- **Textbook (Required)**: J.A. Van DeWalle, K. Kary, J.M. Bay-Williams (2016). *Elementary and middle school mathematics: Teaching developmentally*. 10th ed. Pearson. ISBN-10: 013480208X
- **Textbook (Required)**: Parrish, Sherry (2014). *Number talks: Whole number computation, grades K-5.* Math Solutions. ISBN-10: 1935099655
- **Textbook (Required):** Parrish, S., Dominick, A. (2016). *Number talks: Fractions, decimals, and percentages*. Math Solutions. ISBN-13: 9781935099758
- **GroupMe App**: A way to stay up-to-date with all class routines, assignments, and questions between you, your professor, and your classmates.
- **Google Drive/3-Ring Binder**: This is comprised of problem-solving sets, discussion posts, and all other assignments.

**Additional Resources:**

- Common Core State Standards (CCSS) for Mathematics
  - http://www.corestandards.org/Math/
- Mathematical Research Articles [provided in each module and should be saved for future reference]

**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:**
Philosophy and rationale for teaching math to young children. General math theory and concepts are demonstrated through the use of math materials and other manipulatives.
*Required*: 10 hours of O&P

**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:**
This class represents one component of your education at Chaminade University of Honolulu. An education in the Marianist Tradition is marked by five principles and you should take every opportunity possible to reflect upon the role of these characteristics in your education and development:

1. Education 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

**Native Hawaiian Values:**
Education is an integral value in both Marianist and Native Hawaiian culture. Both recognize the transformative effect of a well-rounded, value-centered education on society, particularly in seeking justice for the marginalized, the forgotten, and the oppressed, always with an eye toward God (Ke Akua). This is reflected in the ʻOlelo Noʼeau (Hawaiian proverbs) and Marianist core beliefs:

1. Educate for Formation in Faith (Mana) E ola au i ke akua (ʻŌlelo Noʻeau 364) May I live by God
2. Provide an Integral, Quality Education (Naʼauao) Lawe i ka maʻalea a kūʻonoʻono (ʻŌlelo Noʻeau 1957) Acquire skill and make it deep
3. Educate in Family Spirit (ʻOhana) ʻIke aku, ʻike mai, kōkua aku kōkua mai; pela iho la ka nohana ʻohana (ʻŌlelo Noʻeau 1200) Recognize others, be recognized, help others, be helped; such is a family relationship
4. Educate for Service, Justice and Peace (Aloha) Ka lama kū o ka noʻeau (ʻŌlelo Noʻeau 1430) Education is the standing torch of wisdom
5. Educate for Adaptation and Change (Aina) ʻAʻohe pau ka ʻike i ka hālau hoʻokahi (ʻŌlelo Noʻeau 203) All knowledge is not taught in the same school

## Program Learning Outcomes (PLOs):

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| **1** | Apply knowledge of learner development, learner differences, diverse students and the learning environment to optimize learning for Elementary students. |
| **2** | Describe central concepts, tools of inquiry and structures of the subject matter disciplines for Elementary students. |
| **3** | Utilize formative and summative assessments, to determine, select, and implement effective instructional strategies for Elementary students. |
| **4** | Analyze the history, values, commitments, and ethics of the teaching profession within the school community. |
| **5** | Explain the Marianist tradition of providing an integral, quality education within diverse learning communities. |

## Course Learning Outcomes (CLOs):

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| **1** | Students will be able to design real-world mathematics lessons that reflect appropriate consideration of student needs, objectives to be achieved, content to be taught while allowing exploration, conjectures, and logical reasoning. |
| **2** | Students will be able to use problem-solving skills to investigate real-life mathematical situations, and communicate mathematical ideas with others verbally, numerically, symbolically, graphically, and/or geometrically. |
| **3** | Students will be able to analyze and implement various approaches, strategies, and materials for teaching lower and upper elementary mathematics. |

## Alignment of Learning Outcomes:

| | **CLO 1** | **CLO 2** | **CLO 3** |
|---|---|---|---|
| **Marianist Values** | -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 | -Oral Communication<br>-Quantitative Reasoning<br>-Critical Thinking |
| **Program Outcomes** | 1, 2 | 1, 2 | 1, 2 |
| **Essential Questions** | 1, 2, 3 | 1, 3 | 1, 2, 3 |

**Assessment:**
The assignments in this course 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. It is your responsibility to turn in all assignments on time before the due dates. A scoring rubric is provided with every assignment to ensure you know what is required to receive the score desired. Feedback and grades on all assignments are provided within 7 days of submission.

**1. Van De Walle (VDWR) & Number Talks Reflections (NTR) – 30% of Final Grade** **[CLO 2 & 3]**
*Modules 1, 2, 3, 4, 5, 6, 7, & 8*
*5 points each*
After reading the first 5 chapters of the Van De Walle textbook, specific Number Talks pages & watching the corresponding classroom videos from both textbooks, you will submit reflections about what you saw by responding to provided questions.

**2. Problem-Solving Sets (PSS) – 40% of Final Grade** **[CLO 2, & 3]**
*Modules 3, 4, 5, 6, 7, & 8*
*10 points per set*
During specific chapters, you will complete five questions from each chapter's content. These questions will require detailed explanation of thought processes and mathematical drawings to show solutions.

**3. Three-Act Task – 30% of Final Grade** **[CLO 1]**
*Information & Understanding: Module 2*
*First Submission: Module 3*
*Second Submission: Module 6*
*Final Submission: Module 9*
*45 points*
You will create your own real-world math lesson called a Three-Act Task, which must focus on one of the content areas covered in this course. You will submit parts of the task during specific modules for feedback before you submit the full, completed task in the final module.

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

**A** - Outstanding scholarship and an unusual degree of intellectual initiative
**B** - Superior work done in a consistent and intellectual manner
**C** - Average grade indicating a competent grasp of subject matter
**D** - Inferior work of the lowest passing grade, not satisfactory for fulfillment of prerequisite course work
**F** - Failed to grasp the minimum subject matter; no credit given

## Course Policies

**Grades of "Incomplete:"**
This policy on incomplete grades aligns with the same University policies.

**Writing Policy:**
For any writing assignments, please use APA format. Please refer to https://apastyle.apa.org for any specific style and grammar guidelines questions.

**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 Kōkua ʻIke: Center for Student Learning 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 Kōkua ʻIke Coordinator at (808) 739-8305 for further information (ada@chaminade.edu).

**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.

**Academic Conduct Policy:**
Any community must have a set of rules and standards of conduct by which it operates. At Chaminade, these standards are outlined so as to reflect both the Catholic, Marianist values of the institution and to honor and respect students as responsible adults. All alleged violations of the community standards are handled through an established student conduct process, outlined in the Student Handbook, and operated within the guidelines set to honor both students' rights and campus values.

Students should conduct themselves in a manner that reflects the ideals of the University. This includes knowing and respecting the intent of rules, regulations, and/or policies presented in the Student Handbook, and realizing that students are subject to the University's jurisdiction from the time of their admission until their enrollment has been formally terminated. Please refer to the Student Handbook for more details. A copy of the Student Handbook is available on the Chaminade website.

For further information, please refer to the Student Handbook, which is linked annually on the following webpage: https://chaminade.edu/current-students/

**Credit Hour Policy:**
The unit of semester credit is defined as university-level credit that is awarded for the completion of coursework. One credit hour reflects the amount of work represented in the intended learning outcomes and verified by evidence of student achievement for those learning outcomes. Each credit hour earned at Chaminade University should result in 45 hours of engagement. This equates to one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester, 10-week term, or equivalent amount of work over a different amount of time. Direct instructor engagement and out-of-class work result in total student engagement time of 45 hours for one credit.

The minimum 45 hours of engagement per credit hour can be satisfied in fully online, internship, or other specialized courses through several means, including (a) regular online instruction or interaction with the faculty member and fellow students and (b) academic engagement through extensive reading, research, online discussion, online quizzes or exams; instruction, collaborative group work, internships, laboratory work, practica, studio work, and preparation of papers, presentations, or other forms of assessment. This policy is in accordance with federal regulations and regional accrediting agencies.

## Course Schedule

| **Module #**<br>Date | **Module Description** | **Assignments Due by End of Module** |
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| **Module 1**<br>October 3rd – 16th | *Van De Walle Textbook Reading:* [Pages 1 – 54]<br>• Chapter 1: Teaching Mathematics in the 21st Century<br>• Chapter 2: Exploring What It Means to Know and Do Mathematics<br>• Chapter 3: Teaching through Problem Solving<br><br>*Number Talks Whole Number Computation*: [Pages 1 – 15]<br>• Chapter 1: What is a Classroom Number Talk?<br><br>*Suggested Research Article(s)*:<br>• "Improving The Planning & Teaching of Mathematics by Reflecting on Research" by Hoffman & Brahier<br>• "Relational Understanding and Instrumental Understanding" by Skemp"<br>• Fostering Mathematical Thinking and Problem Solving: The Teacher's Role" by Rigelman | October 6th<br>• Introductory Post<br>• GroupMe Registration<br><br>October 16th<br>• VDWR (Chap. 1 – 3)<br>• NTR (Module 1) |
| **Module 2**<br>October 17th – 23rd | *Van De Walle Textbook Reading:* [Pages 55 – 102]<br>• Chapter 4: Planning in the Problem-Based Classroom<br>• Chapter 5: Creating Assessments *for* Learning<br><br>*Number Talks Whole Number Computation*: [Pages 16 – 31]<br>• Chapter 2: How Do I Prepare for Number Talks?<br><br>*Suggested Research Article(s)*:<br>• "Preparing for Problem Solving" by Holden | • VDWR (Chap. 4 & 5)<br>• NTR (Module 2)<br>• Three-Act Task Information & Understanding |
| **Module 3**<br>October 24th – 30th | *Van De Walle Textbook Reading:* [Pages 125 – 182]<br>• Chapter 7: Developing Early Number Concepts and Number Sense<br>• Chapter 8: Developing Meanings for the Operations<br><br>*Number Talks Whole Number Computation*: [Pages 35 – 57]<br>• Chapter 3: How Do I Develop Specific Strategies in the K – 2 Classroom?<br><br>*Suggested Research Article(s)*:<br>• "Number Concepts and Special Needs Students: The Power of Ten-Frame Tiles" by Losq<br>• "A Problem-Solving Alternative to Using Key Words" by Clement & Bernhard | • NTR (Module 3)<br>• PSS (Chap. 8)<br>• Three-Act Task (First Submission) |
| **Module 4**<br>Oct 31st – Nov 6th | *Van De Walle Textbook Reading:* [Pages 183 – 237]<br>• Chapter 9: Developing Basic Fact Fluency<br>• Chapter 10: Developing Whole-Number Place-Value Concepts<br><br>*Number Talks Whole Number Computation*:<br>• Designated Classroom Videos Only<br><br>*Suggested Research Article(s)*:<br>• "Research Suggests that Timed Tests Cause Math Anxiety" by Boaler<br>• "Opportunities to Develop Place Value through Student Dialogue" by Kari & Anderson | • NTR (Module 4)<br>• PSS (Chap. 9)<br>• PSS (Chap. 10) |
| **Module 5**<br>Nov 7th – 13th | *Van De Walle Textbook Reading:* [Pages 238 – 272]<br>• Chapter 11: Developing Strategies for Addition and Subtraction Computation | • NTR (Module 5)<br>• PSS (Chap. 11) |

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| | *Number Talks Textbook Reading*: [Pages 157 – 181]<br>• Chapter 5: How Do I Develop Specific Addition and Subtraction Strategies in the 3 – 5 Classroom?<br><br>*Suggested Research Article(s)*:<br>• "Using Research to Develop Computational Fluency in Young Mathematicians" by O'Loughlin | |
| **Module 6**<br>Nov 14th – 20th | *Van De Walle Textbook Reading:* [Pages 273 – 298]<br>• Chapter 12: Developing Strategies for Multiplication and Division Computation<br><br>*Number Talks Whole Number Computation*: [Pages 230 – 261]<br>• Chapter 7: How Do I Develop Specific Multiplication and Division Strategies in the 3 – 5 Classroom?<br><br>*Suggested Research Article*:<br>• "The Distributive Property in Grade 3?" by Benson, Wall, & Malm | • NTR (Module 6)<br>• PSS (Chap. 12)<br>• Three-Act Task (Second Submission) |
| **Module 7**<br>Nov 21st – 27th | *Van De Walle Textbook Reading:* [Pages 337 – 372]<br>• Chapter 14: Developing Fraction Concepts<br><br>*Number Talks Fractions, Decimals, & Percentages*:<br>• Introduction: Why Fractions, Decimals, and Percentages? [Pages 1 – 9]<br>• Chapter 3: What Are the Big Ideas with Rational Numbers? [Pages 63 – 71]<br>• Chapter 4: Number Talks to Help Students Build Fractional Reasoning [Pages 72 – 111]<br><br>*Suggested Research Article(s)*:<br>• "Ten Practical Tips for Making Fractions Come Alive and Make Sense" by Clarke, Roche, & Mitchell | • NTR (Module 7)<br>• PSS (Chap. 14) |
| **Module 8**<br>Nov 28th – Dec 4th | *Van De Walle Textbook Reading:* [Pages 373 – 404]<br>• Chapter 15: Developing Fraction Operations<br><br>*Number Talks Fractions, Decimals, & Percentages*:<br>• Chapter 6: Number Talks for Addition with Fractions [Pages 135 – 178]<br>• Chapter 7: Number Talks for Subtraction with Fractions [Pages 179 – 218]<br>• Chapter 8: Number Talks for Multiplication with Fractions [Pages 219 – 271]<br>• Chapter 9: Number Talks for Division with Fractions [Pages 273 – 296 & 302 – 315]<br><br>*Suggested Research Article(s)*:<br>• "The Role of Representations in Fraction Addition and Subtraction" by Cramer, Wyberg, & Leavitt<br>• "Measurement and Fair-Sharing Models for Dividing Fractions" by Gregg & Gregg | • NTR (Module 8)<br>• PSS (Chap. 15) |
| **Module 9**<br>Dec 5th – 12th | Work on Three-Act Task | • Three-Act Task (Final Submission) |