ED 614 – Elementary Math Methods
Online PACE Winter 2018
3 credits

Instructor: Dr. Travis Mukina
Email: travis.mukina@chaminade.edu
Office Phone: 808-440-4250
Cell Phone: 814-450-8134

Office Hours: *MWF* 12:00-1:30pm
TR 1:00-2:00pm
By Appointment
Office Location: Brogan 132

Learning Materials:

- **Textbook**: J.A. Van DeWalle, K. Kary, J.M. Bay-Williams (2016). Elementary and Middle School Mathematics: Teaching Developmentally. 9th ed. Pearson. ISBN-10: 0133768937
- **Common Core State Standards (CCSS)** for grades K – 6. Electronic copy or hard copy available at
  - http://www.corestandards.org/wp-content/uploads/Math_Standards1.pdf
- Other readings and video links will be provided when necessary.
- **3-Ring Binder**: Throughout the course, you should keep a collection of the course material. This is comprised of chapter handouts, class activities, and problem-solving sets. All will be posted on Canvas under weekly "Modules" and should be kept in an organized binder.
- **GroupMe App**: Reminders, updates, and changes about the course will be posted here. It may also be used to ask questions to classmates or the professor. Any personal questions or comments, please DM me or email me.

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: 8 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:

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):

1	*Content Knowledge* (Knowledge of subject matter)
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):

1	Know, understand, and use the major concepts and procedures that define number and operations, algebra, geometry, measurement, and data analysis and probability.
2	Engage in problem solving, reasoning and proof, communication, connections, and representation.
3	Plan lessons that teach upper elementary students: 1. To understand and use the major concepts and procedures that define number and operations, algebra, geometry, measurement, and data analysis and probability. 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.
4	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.
5	Know and are able to help students understand the history of mathematics and contributions of diverse cultures to that history.
6	Foster students' use of appropriate technology.

Assessment:
Since this course is online, the dates noted are permanent. Read the textbook sections BEFORE you turn in assignments as indicated on the tentative schedule at the end of this syllabus. Always be prepared to explain your thinking in every assignment and every exam. 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. It will be your responsibility to turn in all assignments on time. Late assignments will not be accepted. Submissions will all be done electronically through Canvas in **PDF format**.

1. Attendance / Professionalism / Participation – 10% of Final Grade
Due: Ongoing evaluation by instructor throughout the semester
You are now well into your studies for your chosen career in teacher education. Important in the concept of professionalism is your concern with becoming the best teacher you can become. Your

attendance, promptness, attention, cooperation, and active participation are necessary to facilitate this process. Attitude and responsibility are also important aspects of professionalism. It is your instructor's responsibility to challenge you to grow as a professional and to help you develop a professional disposition. However, you also have a responsibility to be responsive and participate fully in all activities. Your grade will be determined based a holistic evaluation of your professionalism and participation.

2. Problem-Solving Sets – 10% of Final Grade
Due: Every Sunday by Midnight on Canvas
10 points each
Each week you will complete a series of mathematical problems using strategies that elementary level students might use to complete the mathematical tasks. The readings, videos, and presentations can be used to help you make sense of how to solve these problems and prepare you to teach these to students in the future. It is important that you are diligent in solving these each week to the best of your ability. The intention of these problems is to help you not only participate in class discussion, but to help you to deepen your own conceptual understanding of the mathematical concepts you may be teaching in the future. These will be submitted on Canvas in a PDF format.

3. Article Reading Reflections/Number Talk Discussions – 10% of Final Grade
Due: Every Sunday by Midnight
5 points each
There will be a mixture of reading articles and watching Number Talk videos in this course. Reading the selected articles and watching the videos is vital for your success in this class and your own future classroom. For the articles, you will be required to do a reading reflection over the provided articles. Your reflections must be submitted on Canvas in a PDF format. The form in which you complete your reflection can be chosen from the following three options:

a. Written Reflection – requires a 150-word typed reflection of the article
b. Mind Map – summarize main ideas in a mind mapping format that shows strong understanding of the article and several of the main ideas presented in the article
c. Agree & Disagree – Make a bulleted list of 5 points in the article you agree with and 5 points in the article you disagree with. Each bullet must be a complete sentence.

For the Number Talk videos, you will be required to participate in an online group discussion on Canvas. You will post comments, questions, or concerns about what the videos you observe. Reponses must be filled with thoughtfulness contributing the conversation in order to receive full credit.

4. Mathematical Task Analysis and Development – 20% of Final Grade
(The two tasks must be chosen/created and approved by Dr. Mukina by Feb. 18th)
Due: March 11th by Midnight
100 points (50 points per task)
You will develop a "connected" sequence of 2 high cognitive demand number tasks that would be appropriate for elementary age students. For each task, provide a 3-4 sentence rationale justifying why each task qualifies as high cognitive demand.
Then, with a small group of children (2-5 children), implement your 2 high cognitive demand tasks. You should reflect and journal about the experience and then write a 2-page case story for each task that paints a picture of the episodes and your thoughts and comments about students' thinking and your implementation of the task.

5. O&P Reflections – 10% of Final Grade
Due: Throughout the Semester and ALL due by March 17th by Midnight
10 points each
An important part of your effort in this course will be devoted to observing and participating. You will

be required to observe and participate in an assigned classroom for a minimum of 8 hours this semester. Attendance starting once the semester begins is required and contact must be made with your mentor teacher as soon as possible to select dates to attend. Failure to attend O&P sessions could result in an automatic lowering of your final grade by one letter. Appropriate, casual-professional dress at all O&P sessions is extremely important.

- O&P Reflections will reflect on your observation experience five different times during the semester. Your responses need to reflect an understanding of effective methods for teaching mathematics at the elementary level. Specific topics of reflections are posted on Canvas.

6. Literature Review – 20% of Final Grade
(The topic must be chosen and approved by Dr. Mukina by Feb. 18th)
Due: March 17th by Midnight
100 points
Over a period of several weeks, you will locate 5-7 research articles to read on an elementary mathematics concept. Based on your readings, you will develop a 2-3 page literature review. Possible topics must be approved by Dr. Mukina before you begin writing and researching. You may also use 2 articles that we read for class that support the main ideas in your literature review. Your final paper must be free of grammatical and typographical errors along with using proper APA format.

7. Final Exam – 20% of Final Grade
Due: Final – Mar. 17th at 5pm
100 points
There will be a cumulative final exam. The final exam will consist of pedagogical and mathematics content questions based on content identified in grades K – 3. Exams will be emailed out personally and must be submitted on Canvas in a PDF format within 24 hours of receiving. It is expected that you work independently on the exam with no assistance from anyone.

Assignments	Percentage of Final Grade
Attendance / Professionalism / Participation	10%
Problem-Solving Sets	10%
Article Reading Reflections / Number Talks Discussions	10%
Mathematical Task Analysis and Development	20%
O&P Reflections	10%
Literature Review	20%
Final Exam	20%

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

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. Should you want to speak to a confidential source you may contact the following:

- Chaminade Counseling Center: 808-735-4845
- Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role.

Disability Access:
The University is committed to providing reasonable accommodations for all persons with disabilities. This syllabus is available in alternate formats upon request. Students who need accommodations must be registered with Student Disability Services. 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 the instructor to plan accordingly. Failure to provide written documentation will prevent your instructor from making the necessary accommodates. Please refer any questions to the Dean of Students.

Course Outline (Winter)

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

Week # / Day # Date	Class Description	Assignments Due Each Sunday by Midnight
Week 1 Jan. 8th – 14th	Book: *Chapter 1*: Teaching Mathematics in the 21st Century • Pages 1 – 12 Article: "Improving The Planning & Teaching of Mathematics by Reflecting on Research" by Hoffman and Brahier	Jan. 14th • Problem-Solving Set 1 • Brahier Reflection on Canvas in PDF
Week 2 Jan. 15th – 21st	Book: *Chapter 2*: Exploring What It Means to Know and Do Mathematics • Pages 13 – 31 Article: "Relational Understanding and Instrumental Understanding" by Skemp	Jan. 21st • Problem-Solving Set 2 • Skemp Reflection on Canvas in PDF
Week 3 Jan. 22nd – 28th	Book: *Chapter 3*: Teaching through Problem Solving • Pages 33 – 55 Article: "Fostering Mathematical Thinking and Problem Solving: The Teacher's Role" by Rigelman	Jan. 28th • Problem-Solving Set 3 • Rigelman Reflection on Canvas in PDF
Week 4 Jan. 29th – Feb. 4th	Book: *Chapter 4*: Planning in the Problem-Based Classroom • Pages 57 – 83 Article: "Preparing for Problem Solving" by Holden	Feb. 4th • Problem-Solving Set 4 • Holden Reflection on Canvas in PDF
Week 5 Feb. 5th – 11th	Book: *Chapter 8*: Developing Early Number Concepts and Number Sense • Pages 142 – 164 Article: "Number Concepts and Special Needs Students: The Power of Ten-Frame Tiles" by Losq Number Talks Video: "Ten Frames: 8+6"	Feb. 11th • Problem-Solving Set 5 • Losq Reflection on Canvas in PDF • Number Talks 8+6 Discussion Post
Week 6 Feb. 12th – 18th	Book: *Chapter 9*: Developing the Meaning for the Operations • Pages 167 – 191 Article: "A Problem-Solving Alternative to Using Key Words" by Clement & Bernhard Number Talks Video: "Array Discussion: 8x25"	Feb. 18th • Literature Review Topic must be approved by Dr. Mukina • Mathematical Tasks must be chosen and approved by Dr. Mukina • Problem-Solving Set 6 • Clement & Bernhard Reflection on Canvas in PDF

		• Number Talks 8x25 Discussion Post
Week 7 Feb. 19th – 25th	Book: *Chapter 10*: Developing Basic Fact Fluency • Pages 194 – 220 Article: "Research Suggests that Timed Tests Cause Math Anxiety" by Boaler Number Talks Video: "Multiplication String: 7x7"	Feb. 25th • Problem-Solving Set 7 • Boaler Reflection on Canvas in PDF • Number Talks 7x7 Discussion Post
Week 8 Feb 26th – Mar. 4th	Book: *Chapter 11*: Developing Whole-Number Place Value Concepts • Pages 222 – 245 Article: "Opportunities to Develop Place Value through Student Dialogue" by Kari & Anderson	Mar. 4th • Problem-Solving Set 8 • Kari & Anderson Reflection on Canvas in PDF
Week 9 Mar. 5th – 11th	Book: *Chapter 12*: Developing Strategies for Addition and Subtraction Computation • Pages 247 – 275 Article: "Using Research to Develop Computational Fluency in Young Mathematicians" by O'Loughlin Number Talks Video 1: "Addition: 38+37" Number Talks Video 2: "Subtraction: 70-59"	Mar. 11th • Mathematical Task Analysis and Development • Problem-Solving Set 9 • O'Loughlin Reflection on Canvas in PDF • Number Talks 38+37 Discussion Post • Number Talks 70-59 Discussion Post
Week 10 Mar. 12th – 17th	Book: *Chapter 13*: Developing Strategies for Multiplication and Division Computation • Pages 277 – 297 Article: "The Distributive Property in Grade 3" by Benson, Wall, & Malm Number Talks Video: "Multiplication: 32x15"	Mar 17th • Problem-Solving Set 10 • Benson, Wall, & Malm Reflection Due on Canvas in PDF • Number Talks 32x15 Discussion Post • All 5 O&P Reflections Due • Literature Review Due
FINAL EXAM	Chapters 1 – 4 and 8 – 13	• Emailed: Mar. 16th at 5pm • Due: Mar. 17th at 5pm