EED 4230 (formerly EED 302)
Teaching Mathematics at the Elementary – Middle Levels (4 credits)
SECTION U02: Mondays, 8:00am – 11:20am; MUC3, Room 110
Winter 2018
Oakland University
School of Education and Human Services
Teacher Development and Educational Studies
[NOTE: During the semester, changes might occur]

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Office Hours Monday 7:30 to 7:50am & 11:20am to 11:50am or by appointment

Catalog Description: This course "assists prospective teachers in developing sound pedagogical strategies and instructional techniques for teaching mathematics in the elementary and middle school. Includes a required field experience. (Formerly EED 4230)"

Prerequisites: EED 354 or 3000; MTE 210 or MTE 2110

Readings: All required/optional readings will be made available online via Moodle.
Textbook references will be: Van de Walle, J. A., Karp, K. S., & Bay-Williams, J. M. (2015). *Elementary and middle school mathematics: Teaching developmentally (9th Ed.)*. Boston: Pearson. ISBN-13: 9780134046952 or ISBN-10: 0134046951

Notebook (REQUIRED by 2nd Class):
A4x4 quadrille rule, 75 pages, notebook that is 9 1/4" by 11 3/5" such as the National 43648 or Ampad AMP22156 (available at Staples) or Rediform 43648 or Tops 35126. *At a minimum, a notebook with graph paper or graph paper.*

Technology:
You might be asked to contribute online via google docs, moodle chat, an online concept maps (?). This might require you to bring a laptop, tablet, or smartphone. It is likely you work in pairs or in small groups and only 1 of you need to have a device
(**Note**: *When electronic devices are in use, I will see what is on your screen*).

Michigan Certification Standards (MCS) for Elementary Teachers: Mathematics

http://www.michigan.gov/documents/mde/Elementary_Program_Standards_557145_7.pdf

Candidates demonstrate knowledge, understanding, and application of the major concepts, procedures, and reasoning processes in mathematics that define number systems and number sense, geometry, measurement, statistics and probability, and algebra in order to foster student understanding and use of patterns, quantities, and spatial relationships that can represent phenomena, solve problems, and manage data.

Candidates will know and demonstrate an understanding of how to teach:

1.3.1   Number sense and knowledge of development, multiple representations of numbers and number systems; concepts of number, number theory, and number systems;

1.3.2   Numerical computation; use of four basic operations (addition, subtraction, multiplication, and division) in multiple contexts; modeling, explanation, and development of a variety of computational algorithms;

1.3.3   Estimation strategies to quantities, measurements, and computation to determine the reasonableness of results;

1.3.4   Measurable attributes of objects and the units (non-standard and standard), systems (customary and metric), and process of measurement; application of appropriate techniques, tools, and formulas to determine measurements of two- and three-dimensional objections;

1.3.5   Major concepts of Euclidean geometry from a variety of perspectives, including coordinate and transformational;

1.3.6   Question formulation that can be addressed with data; collection, organization, display, and interpretation of relevant data; selection and use of appropriate statistical methods, descriptive and inferential, to analyze data, make predictions, and make decisions;

1.3.7   Basic concepts of probability; interpretation of probability in real-world situations, construction of sample spaces; modeling and comparing experimental probabilities with mathematical expectations; using probability to make predictions;

1.3.8   Patterns, relations, and functions; understand and apply concepts of variable and function; represent and analyze mathematical situations and structures using algebraic symbols; model and solve contextualized problems using various representations, such as graphs, tables, and equations;

1.3.9   Knowledge of historical development of mathematics that includes the contributions of underrepresented groups and diverse cultures; and

1.3.10   Axiomatic systems and proofs in different branches of mathematics, such as algebra and geometry; describe and represent mathematical relationships; use mathematical modeling to solve real-world problems.

InTASC (Interstate Teacher Assessment and Support Consortium) Standards
(http://www.ccsso.org/Documents/2013/2013_INTASC_Learning_Progressions_for_Teachers.pdf)

* The standards listed below are the focus in this course. But the remaining standards are also integrated into the course.

- *Standard #4 Content Knowledge*: The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

- *Standard #6 Assessment*: The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

- *Standard #7 Planning for Instruction*: The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross- disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

- *Standard #8 Instructional Strategies*: The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

- *Standard #9 Professional Learning and Ethical Practice*: The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

High-Leverage Teaching Practices (http://www.teachingworks.org/work-of-teaching/high-leverage-practices)

* The practices listed below are the focus in this course. But the remaining practices are also integrated into the course.

- HLP #2 Explaining and modeling content, practices, and strategies
- HLP #3 Eliciting and Interpreting Individual Students' Thinking
- HLP #4 Diagnosing particular common patterns of student thinking and development in a subject-matter domain
- HLP #12 Learning about students' cultural, religious, family, intellectual, and personal experiences and resources for use in instruction (related to HLP #10 Building respectful relationships with students)
- HLP #17 Interpreting the results of student work, including routine assignments, quizzes, tests, projects, and standardized assessments

EED4230 Course Outcomes/Goals:

EED4230 is one of the required courses in Oakland University's Elementary Education Program. Upon completion of the program, teacher candidates should demonstrate the ability to:

1) Explain and model the key concepts and skills of mathematics appropriate to K-8 mathematics curriculum [MCS 1.3.1 ~ 1.3.10; INTASC 4; HLP 2].
2) Identify current trends in mathematics education policy, goals, and standards [InTASC 7].
3) Design mathematics lessons that address content/practice standards and adaptations in order to be responsive to the needs, values, and a diverse group of students [InTASC 4, 7, 8; HLP 4].
4) Elicit and interpret students' mathematical thinking and plan appropriate instruction [InTASC 6, 7, 9; HLP 3, 17].

5) Utilize assessment strategies to monitor the development of mathematical concepts and skills [InTASC 6, 7, 9; HLP 3, 4, 17].

Field Experience:
School and Field Services Offices will assign field placements. You must be able to implement a lesson with your field placement students and cooperating teacher. *IF you are in a placement where you do NOT do mathematics with students, attempt to find a time when you can / teacher who does for the Assess-Teach-Assess assignment (see below). If NOT possible let me know soon.*

Methods of Instruction
Throughout the semester several modes of instruction will be used by the instructor. The variety of modes are meant to provide a model for students enrolled in EED4230 that can be used or adapted for use in K-8 grade classrooms with varying degrees of effectiveness; however, the modes of instruction presented are not meant to be inclusive of all effective modes. In EED4230 students will participate in lectures, large group discussions, small group discussions, deductive inquiry and problem solving, cooperative learning groups, supervised field work, micro- and peer-teaching, critical reviews, performance tasks, and online.

Course Assignments and Assessment
* Detailed directions, resources, submission forms, and rubrics are in Moodle.

1. Exams (20%): Performance Demonstrations/ Exam #1 (50 pts) & Exam #2 (50 pts):
Each exam will have a closed part (class concepts) and an open part (application/problem solving). It is important for you to learn new terminology; however, tests and questions will primarily cover concepts and application rather than memorized facts. A variety of short answer, picture drawings, essay questions and performance tasks will be included on tests covering all readings and course work. You are encouraged to meet and study with classmates outside of class. Opportunities will be provided to use the lab and its materials. [MCS 1.3.1 ~1.3.10; InTASC 4, 8; HLP 2]

2. Class Participation (10 %)
As a future teacher, I expect you to exhibit a desire to learn and be an active participant in the learning process. This course is not a lecture class. Your participation in each class session is very important. Everyone needs to ask questions and share experiences. For maximum credit, class contributions must show evidence of intense participation. For both large and small group discussion/work, you need to show: (a) the ability to link assigned reading to discussion and relate relevant ideas, (b) helping to create an atmosphere conducive to learning (in-class and online) that includes consideration for classmates (equity) / instructor (professionalism) and necessary supplies and materials. [MCS 1.3.1 ~1.3.10; InTASC 9]
> ** Note: Please follow the procedures listed below in case of absence:*
> *(a) Provide a courtesy email to the instructor and so that your group members can be prepared accordingly.*
> *(b) Individually we (student and instructor) will coordinate requirements for absences and excessive tardiness).*

3. Math Journal (10 %)
You will be assigned weekly math problems and reflection questions based on the readings. The journal should be completed every week, in preparation for each class. Your work on the journal will be assessed weekly and due at the beginning of class. These math journals may include your responding to classmate's reflection responses. **Note:** The textbook /reflection questions are completed individually and the Mathematics Application / Problem solving questions completed with your Math Journal partners. You will submit this electronically to moodle. *Be prepared to respond to a classmate's reflection questions (more details during class). For the Mathematics Application/Problem Solving section: write/type your name/s (or ALL) next to the Math Application/Problems you worked on. Do not let the SAME person work on the problem solving problems every week. Otherwise, grade may reflect effort/cooperation/divvying up work (i.e., a +grade or -grade)..*

4. Math Assessment Project (20 %)
This project will involve careful analysis of classroom assessment data that I will provide to you. The project will be completed in groups (more details during class and on moodle). *Note: Based on observation and feedback, grade may reflect effort/cooperation/divvying up work (i.e., a +grade or -grade) to the assignment.* [MCS 1.3.1, 1.3.2; InTASC 4, 6, 7, 8, 9; HLP 3, 4, 17]

5. Lesson Design & Rehearsal (20 % ~ 5% based from classmate feedback)
You will engage your classmates in thinking about a key topic related to teaching children mathematics, selecting a topic and lesson from a given list. The lesson will be designed for your peers or for them to role-play as young children). You will do this assignment with a group, and your group must initiate a meeting with me to discuss your lesson ideas before teaching your lesson (i.e., *initial meeting: 2 weeks before, and 1 week before your lesson should be **mostly** complete*). More details about this assignment

will be provided in class and on moodle. *Note: Based on observation and feedback, grade may reflect effort/divvying up work* (i.e., a +grade or -grade*) to the assignment.* [MCS will Vary; InTASC 7, 8; HLP: 2, 3]

6. Assess-Teach-Assess Project (20 %)
During your placement, you will interview two students about their mathematical understanding/thinking, teach a lesson (if possible), and then re-interview these same students. You will carefully analyze students' understanding and changes to their understanding. *Note: If you work with a partner, based on observation and feedback, grade may reflect effort/cooperation/divvying up work (i.e., a +grade or -grade) to the assignment.* [MCS will Vary; InTASC 7, 8; HLP: 2, 3]

Grading Standards:

EED4230 will be graded using the University's 32-point scale, 1.0-4.0. Your earned percentage will determine your grade in this class. Students who complete each assignment should not assume that full credit will be given. The quality of the assignments will be considered (e.g., well-organized and neat presentation, correct citation format, spelling, grammar, meeting deadlines, and degree of insight displayed in the completed assignment will be considered in the evaluation of each assignment). The purpose of evaluation of tests, outside assignments (daily work), fieldwork, and class participation is to provide a well-rounded picture of each student's potential for becoming a member of the teaching profession. Higher final grades should reflect students who hold the potential to become model members of the mathematics teaching profession.

Grading Scale:

Considered "A"s	Considered "C"s	Considered "D"s
4.0: 100 % - 98.60	2.9: 79.59 - 78.60	1.9: 69.59 - 68.60
3.9: 98.59 - 96.60	2.8: 78.59 - 77.60	1.8: 68.59 - 67.60
3.8: 96.59 - 94.60	2.7: 77.59 - 76.60	1.7: 67.59 - 66.60
3.7: 94.59 - 92.60	2.6: 76.59 - 75.60	1.6: 66.59 - 65.60
3.6: 92.59 - 90.60	2.5: 75.59 - 74.60	1.5: 65.59 - 64.60
	2.4: 74.59 - 73.60	1.4: 64.59 - 63.60
Considered "B"s	2.3: 73.59 - 72.60	1.3: 63.59 - 62.60
3.5: 90.59 - 88.60	2.2: 72.59 - 71.60	1.2: 62.59 - 61.60
3.4: 88.59 - 86.60	2.1: 71.59 - 70.60	1.1: 61.59 - 60.60
3.3: 86.59 - 84.60	2.0: 70.59 - 69.60	1.0: 60.59 - 59.60
3.2: 84.59 - 82.60		
3.1: 82.59 - 80.60		
3.0: 80.59 - 79.60		

Course Policy

1) Academic Integrity: Cheating and plagiarism are considered serious infractions at Oakland University as delineated in the Oakland University Catalog. *In your assignments, any material or another person's ideas (even classmates') must be documented and should be cited under a separate section.* All allegations of academic misconduct will be reported to the Dean of Students and, thereafter, to the Academic Conduct Committee for adjudication. Anyone found guilty of cheating in this course will receive a course grade of 0.0, in addition to any penalty assigned by the Academic Conduct Committee.

2) Late Policy: Late (after the class starting time of day due) assignments will be scored in the following manner:
Up to one session late: score x 90%   Up to two sessions late: score x 80%
Assignments more than two sessions late will not be accepted unless special arrangements have been made and approved prior to the due date (Please e-mail me if an assignment will be late).

3) Attendance Policy: Students who have three unexcused absences will automatically receive a concern report that will be submitted to the Faculty/Student Concerns Committee.

4) If the instructor has concerns regarding a student's "professionalism," professional development as a teacher and/or commitment to the teaching profession, a concern report that may be submitted to the Faculty/Student Concerns Committee. The student and instructor will discuss this prior to submission.

5) All written requirements of this course must be type-written (or photographs of hand-written work as word or PDF documents). Submission format should be in size 12 font, Times New Roman, single-spaced. When you submit application & problem solving solutions, you can do your work by hand (even written explanation), take photographs of that work or scan and submit as a word or PDF document. **All assignments will be submitted electronically.** Contact me for exceptions

6) Writing style and bibliographic citations must follow the APA guidelines presented in *Publication Manual of the American Psychological Association* (6th ed.). Washington, D.C.: American Psychological Association. Refer to this link: https://library.oakland.edu/events/brownbag/apa_resources.htm

7) Electronic Interruptions: Electronic devises (laptops, phones) are to be used only for course-related activities in class except in case of an emergency. If an emergency does arise, please be sure to discuss this with the instructor.

8) Office Hours: They will be 30 minutes before class (up until 10 minutes until the hour) and for 30 minutes after class. In case you are not available, please contact me to schedule an appointment (on-campus / virtual).

9) Accommodation: Faculty in the School of Education will make every effort to accommodate unique and special needs of students with respect to speech, hearing, vision, seating, or other possible disabling conditions. Please notify the instructor as soon as possible of requested accommodations and ways to help. Please refer to Disability Support Services for more information / support: https://oakland.edu/dss/

10) Email Response: Course instructor will respond to students' emails within 24 hours.

11) Online Activities/ Online Submission:

- Use an Internet connected computer with the most updated versions of your favorite web   browser installed. *Use of smartphones and tablets is not recommended.*
- In the event that your computer crashes or Internet goes down, it is essential to have a   backup plan to be able to log in from another computer or another location as needed.
- For the problems with logging in, maneuvering the course, or posting work, first check to see if it is a technical problem by communicating the problem through "Moodle Help" as described above, or call the e-Learning and Instructional Support Office at (248) 805-1625 during business hours or submit a help ticket: http://www2.oakland.edu/elis/help.cfm?lms=2.
- For questions or concerns related to course content, email the course instructor.
- If I cannot attend a class, we will have an online session. For online sessions, the agenda will be posted in advance. You have opportunities to share helpful information or questions via the Teachers' Lounge Forum. Before beginning the online activities, go through the agenda and read all instructions well before you get started.
- Write all of your assignments in a Word or other word processing program file and copy and paste it in discussion or assignment posting or attach the file for assignment submission. This prevents loss of work when weather or problems with the system temporarily freezes up the OU system or Moodle.

* Course Evaluation: Please complete your course evaluation by the last day of class (http://www.oakland.edu/evals).

Assessment Record

Exam #1 (50 points)	20%
Exam #2 (50 points)	
Math Journals	10%
Math Assessment Project	20%
Rehearsal & Lesson Design	20%
ATA Assignment	20%
Class Participation	10%
Total	**100%**

Major Topics and Tentative Course Schedule
EED 4230 (formerly EED 302)
SECTION U02: Monday, 8:00am – 11:20am

Notes:
1. The following course schedule and assignments due dates are subject to change. It is your responsibility to check Moodle and/or emails for corrections or updates to the syllabus. Any changes will be posted in Moodle and/or through email.
2. All reading will be available online via Moodle. Read all materials prior to class.

Class	Date	Topics	Assignment Due
C1	01/08/18	• Community / Culture Building • What is mathematics? (VdW, Chap. 2) What does Social Justice and Equity have to do with Mathematics? • Teaching Practice Standards • Educational Theories in mathematics • Assessment • *Preview Math Assessment Project*	
	01/15/18	**MLK Birthday (NO CLASS)**	
C2	01/22/18	• Teaching Through Problem Solving (Chap. 3) • Developing early number concepts and number sense (Chap. 8) • Developing Meanings of Operations (Chap. 9) • *Preview Rehearsal / Lesson Plan*	• MJ 1
C3	01/29/18 [ONLINE CLASS]	• Assessment (Chap. 5) • Three part lesson Plan (Chap. 4) • Master basic facts (Chap. 10)	• MJ 2
C4	02/05/18	• Developing whole-number place-value concepts (Chap. 11) • Developing strategies for addition and subtraction computation (Chap. 12: pp. 247-270) • Developing strategies for multiplication and division computation (Chap 13: pp. 277-292) • Content Review • *Preview Assess-Teach-Assess*	• MJ 3
C5	02/12/18	• Brief Review • **Exam #1**	• MJ 4
	02/19/18	**Winter Recess**	
C6	02/26/18	• Developing concepts of exponents, integers, and real numbers (Chap. 23) • Developing fraction concepts (Chap. 15)	• **Math Assessment Due (End of the week)**
C7	03/05/18	• Developing strategies for fraction computation (Chap. 16) • Developing concepts of decimals and percent (Chap. 17) • *[*Lesson Design & Rehearsal/s]*	• MJ 5
C8	03/12/18	• Proportional reasoning (Chap. 18) • Data Analysis (Chap. 21) • *[*Lesson Design & Rehearsal/s]*	• MJ 6
C9	03/19/18	• Probability (Chap. 22) • Algebraic Thinking (Chap. 14) • *[*Lesson Design & Rehearsal/s]*	• MJ 7
C10	03/26/18	• Measurement (Chap. 19) • Geometric Thinking & Concepts (Chap. 20) • Content Review • *[*Lesson Design & Rehearsal/s]*	• MJ 8

C11	04/02/18	• Brief Review • **Exam #2**	• MJ9
C12	04/09/18	• "In My Shoes" – Equity discussion • *Presentations / Debriefing I [Lesson Design & Rehearsal]*	
C13	04/16/18	• Technology (Chap. 7) • *Presentations / Debriefing II [ATA]* • Course Evaluation http://www.oakland.edu/evals	• MJ 10 (optional) • **Assess Teach Assess Due (end of the week)**

Selected Resources

Common Core State Standards for Mathematics: http://www.corestandards.org/Math

High Leverage Teaching Practices: http://www.teachingworks.org/work-of-teaching/high-leverage-practices

Illustrative Mathematics: http://www.illustrativemathematics.org/

Interstate Teacher Assessment and Support Consortium (InTASC):

http://www.ccsso.org/Documents/2013/2013_INTASC_Learning_Progressions_for_Teachers.pdf

National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all*. Reston, VA: Author

PARCC - Partnership for Assessment of Readiness for College and Careers: http://www.parcconline.org

Smarter Balanced Assessment Consortium: http://www.smarterbalanced.org