MATH 308: Mathematics for K – 8 Teachers: Rational Numbers Western Kentucky University – Summer 2020

Section Number: C01	Class 7	
Instructor: Nicholas Fortune	Classr	
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Class Times: MTWRF 8:00 – 9:40 Classroom: <u>https://wku.zoom.us/j/98612491485</u> Office Hours: By Appointment

Course Description: 3 Credit Hours - Conceptual development of rational number system, including operations with and relationships among fractions, decimals, and percents.

Learning Objectives: MATH 308 specifically meets the four learning objectives below:

- 1. Demonstrate a conceptual understanding of the relationships and interconnectedness among fractions, decimals, percent, and ratios.
- 2. Recognize and develop multiple representations of equivalent terms, simplest form, rational number properties, denseness property, and ordering of fractions and decimals.
- 3. Complete computations with fractions and decimals using models and manipulatives.
- 4. Solve rational number problems in multiple ways.

Prerequisites: Completion of MATH 205 with a grade of C or better; for students in Elementary Education, Middle Grades Mathematics Education, or Special Education Teacher Certification programs only.

Textbook: You are required to purchase a MATH 308 Course Packet from the WKU Bookstore. You will be receiving more information about where and how to purchase this packet in an email.

Classroom Materials: You should bring pencils (not pens), colored pencils, and a three-ring binder with plenty of loose-leaf paper (not spiral bound) and graph paper (there is some graph paper printed at the back of the course packet; should you need more, you can print it from Blackboard) with you to class every day. The binder will help you keep all of your work organized throughout the semester.

Course Content & Instruction: MATH 308 may be different than any course you've had before – unless you have also taken MATH 205 at WKU! It is listed as a math course, and you certainly will study a lot of mathematics, but not necessarily the kind of mathematics you've studied before. In this course you will learn the mathematics needed to become an effective teacher.

What kind of mathematics do teachers need to know? It is mathematics that helps teachers understand how their students are thinking about mathematics and how they can help their students deepen their understanding. It is mathematics that helps teachers see how the different topics in elementary and middle school mathematics fit together and how they can help their students move from easier topics to more challenging topics. It is mathematics that helps teachers re-examine what they have learned before so they can understand the underlying concepts, and so they can effectively support their students' learning. This may be a new kind of mathematical knowledge for you. Learning this mathematics requires that you start fresh. It requires that you become genuinely curious about how and why all those rules in mathematics work like they do, about how children think about mathematics, about the methods children are likely to use to solve mathematical problems and why some of these methods are useful for them and some are not, and about what kinds of mathematical understandings are essential for children to acquire.

Because you will be learning a new kind of mathematics, you will notice very soon that you are not doing the usual kinds of things. You will not be shown how to do sample problems and then asked to practice more on your own. Instead, you will:

- View videotapes of students doing mathematics and be asked about what they do and do not understand.
- Work problems posed to students in grades K-8 and predict how students might solve them.
- Solve new kinds of problems designed to provide insight into several mathematical topics and promote your mathematical reasoning skills. In doing so, you will understand familiar problems more deeply.
- Examine patterns and structure; formulate generalizations and conjectures; investigate and test your conjectures using concrete materials and other tools; and construct and evaluate mathematical arguments. You will learn to ask yourself: Is there a pattern? What might happen next? Can I make a generalization or conjecture? Do I think my conjecture is true for all cases, true for some cases, true for no cases (that is, false for all cases), and why? Under what circumstances is it not true? Can I give an example? Why does it work? How might I convince my group members that my conjecture is correct?
- Be asked to explain your reasoning how you were thinking while you were solving a problem, why you think students will solve problems in a particular way, and why you think some methods for solving problems work better than others. *Developing good explanations that are convincing to others is one of the best ways to verify that you truly understand.*

This course will be one of the more challenging courses you take as you prepare to become a teacher. This is because most of what you will learn will be new. You won't always be able to rely on what you've learned before. But, if you commit yourself to becoming an effective mathematics teacher and apply yourself, what you learn in this course will be invaluable.

Internet Access: This class will primarily take place via Zoom, as well as, via Blackboard and your WKU email account. Thus, internet is important for this course. However, I know that everyone's home internet is different. Please reach out to me if you are concerned about your internet access, connectivity, and/or stability. I will work with students in a one on one capacity to come up with a plan for them. You should check your WKU email account daily, as all announcements for the class will be sent there.

Calculator: You *will not* be allowed to use a calculator in this course. A successful elementary teacher must be proficient with numbers and completely confident when solving problems mentally and on paper without the use of the calculator. Please do not reach for a calculator in class, even to check your answers. You should be able to verify that your work is correct by evaluating the process that you used to solve a particular problem. In addition, you are

encouraged to avoid using calculators on your homework assignments as this will help prepare you for quizzes and exams.

Attendance and Absences: Attendance and participation in class is crucial to your success in this course. If you miss a class for any reason, you will be responsible for obtaining any materials and/or information from your fellow classmates, *not from the instructor*.

Because this class is taught in a cooperative inquiry-based format, small group and whole class participation is an essential part of the experience for both you and your classmates. Consequently, absences by individual students hurt not only that student, but also the rest of the class. Furthermore, as a future educator, you must get in to the habit of showing up on time every day ready for work! Excessive absences from class will result in a lowering of your overall grade in the course as follows:

Number of Absences	0 – 2	3	4	5	6
Overall Grade Lowered	None	One Letter	Two Letters	Three Letters	Four Letters

The only exceptions to this policy will be those absences that are caused by University approved activities or religious observances for which documentation has been provided to the instructor in advance. Internet issues will be treated on a case by case basis. The same goes for all other absences (sickness, death in the family, grandmother in hospital, vacation, car issues, and so on). You get two free absences to cover these unexpected events. If you have extenuating circumstances, you may be eligible for other options including medical withdrawal, incomplete, audit, and so on. My general rule of thumb is to let me know ahead of time and we can figure it out.

Arriving Late or Leaving Early: In order to be counted present (not absent) for class, you need to be in the classroom for the entire class period. If you arrive late, leave early, or leave for a period of time in the middle of class, you will accrue one-half of an absence. It is important that you take care of all of your personal needs before arriving to class. If you feel that you have an extenuating circumstance that requires a one-time exception to this policy, please discuss it with your instructor. If you need a more permanent exception, you will need to provide documentation from the Student Accessibility Resource Center.

Assessment and Grading: Your grade in the course will be based on the following:

Exams: There will be two regular exams (worth 100 points each) and one cumulative final exam (worth 140 points) to measure your understanding of the course material. The exams will be taken outside of the normal class times on the dates listed in the course calendar. The exams will be taken on Blackboard. More information about the details of the exams will be distributed in class and on Blackboard.

Quizzes: There will be three quizzes (worth 15 points each) to check your understanding with a few short-response questions. These quizzes will require about 30 minutes and will be given during normal class times on the dates listed in the course calendar. The quizzes will be at roughly 9:00am on their assigned day and taken on Blackboard.

Homework: Homework will be assigned following each lesson in the course packet (worth a total of 15 points). These assignments are designed primarily as learning tools and not assessments. You are expected to complete all homework problems in the packet. Once completing those you will log into Blackboard and provide a short answer to one or two select homeworks as proof that you did the homework. Submitting those answers (or answer) will be given credit for homework submission. Points will not be deducted for up to two incomplete or unsatisfactory homework assignments. However, beginning with the third incomplete or unsatisfactory assignment, you will lose one point per assignment from the 15 available points.

Determination of Final Course Grade: The above assessments provide a total of 400 possible points in the course. Final course grades will be determined using the following scale:

Percentage	0% - 59%	60% - 69%	70% - 79%	80% - 89%	90% - 100%
Letter Grade	F	D	С	В	Α

Note: All missed exams, quizzes, and assignments will be given a grade of 0. Late homework assignments will not be accepted. The only exceptions to this policy will be those absences that are caused by University approved activities or religious observances for which documentation has been provided to the instructor in advance. The instructor will evaluate unexpected illness or unforeseen catastrophic circumstances on a case-by-case basis and determine whether a make-up is appropriate. Every effort must be made by the student to notify the instructor as soon as possible in these cases.

Understanding Course Grades:

- A Pre-service teacher consistently demonstrates competencies that signal that s/he is proficient in the mathematical topics covered in the course. This qualification includes a deeper level of understanding than that expected of the students s/he is preparing to teach. Pre-service teacher demonstrates this level of understanding by consistently going beyond the information explicitly presented by the course instructor to completing new kinds of tasks. This ability to apply one's knowledge to new contexts and to put together various ideas is *essential* for effective classroom teaching because good teachers are able to respond to children's questions, to support and assess children's mathematical proficiency, and to interpret new curricula.
- **B** Pre-service teacher occasionally demonstrates the competencies and the knowledge transfer abilities that characterize the mathematical proficiency of A-level students, but at times is limited to learning well just the information explicitly presented by the course instructor. Pre-service teacher shows evidence of better-than-acceptable level of mathematical proficiency in the topics studied and a deeper level of understanding than that expected of the students s/he is preparing to teach.
- C Pre-service teacher consistently demonstrates good levels of performance on tasks measuring straightforward learning of course content, but rarely completes knowledge transfer tasks successfully. Shows evidence of an acceptable level of mathematical proficiency of the topics studied and shows evidence, although inconsistent, of a deeper level of understanding than that expected of the students s/he is preparing to teach.
- **D** Pre-service teacher does not consistently show acceptable levels of performance, even on tasks measuring content explicitly presented by the course instructor. Although the pre-service teacher may have mastered some of the course content, and s/he shows signs of considerable effort, serious questions persist about her/his mathematical proficiency and whether s/he has developed a deeper level of understanding than that expected of the students s/he is preparing to teach.
- **F** Pre-service teacher shows a profile similar to that of the D student but, in addition, appears to be unprepared to teach others at this time. Pre-service teacher consistently exhibits lack of effort, profound and persistent misconceptions, and/or the failure to master some of the course topics.

Academic Dishonesty: Students who commit any act of academic dishonesty will receive from the instructor a failing grade in the course without possibility of withdrawal. The instructor will also present the case to the Office of Student Conduct for disciplinary sanctions.

ADA Statement: In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at <u>sarc.connect@wku.edu</u>. Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

Title IX Misconduct/Assault: Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) and Discrimination and Harassment Policy (#0.2040) at

https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf https://wku.edu/policies/hr policies/2040 discrimination harassment policy.pdf.

Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121.

Please note that while you may report an incident of sex/gender-based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and **MUST** report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

Diversity, Equity, Inclusion, and Anti-Racism: The following statement is one made by the instructor. The statement is their own and does not necessarily represent the views of the Department of Mathematics, Ogden College of Science and Engineering, or Western Kentucky University.

My pledge to students: Our class will be one that values inclusion, diversity, and equity to the highest degree, and strives to be anti-racist. Should you feel any form of oppression or discrimination from me, a student in this class, or anyone at the university, please come and talk to me about these issues. I am always willing to listen and support you to the best of my ability.

Withdrawal Dates: The last day to drop this course without a grade, without paying a fee, and to change from audit to credit is Wednesday, July 15, 2020. The last day to withdraw from this course with a W or change from credit to audit is Tuesday, August 4, 2020.

Math Tutoring Center: The Department of Mathematics provides free virtual tutoring. Hours for the lab and specific tutor schedules are posted and will be announced in class or by email.

The Learning Center: The Learning Center (DSU 2141) provides free one-on-one tutoring and study areas available to all WKU students. For more information, or to schedule a tutoring appointment, please call TLC at (270) 745-6254 or visit their website at <u>www.wku.edu/tlc</u>

Disclaimer: The instructor reserves the right to change, alter, modify, or tweak anything in this document at any time for any reason.