Fall 9-1-2021

M 132.01: Numbers and Operations for Elementary School Teachers

Ke Wu
University of Montana, Missoula, ke.wu@umontana.edu

M 132: Number and Operation for Elementary School Teachers
Fall, 2021

Instructor: Ke Wu Email: ke.wu@umontana.edu

Class time: 9:00-9:50AM on M/W/F

Class location: Zoom:

https://umontana.zoom.us/j/95892251097?pwd=OTRvK3pLMWRmb0o1eTY5RitPL2w1Zz09

Meeting ID: 958 9225 1097 Passcode: 444582

To allow most flexibility and accessibility, all our classes via Zoom will be recorded and the recordings will be shared with students.

Office hours: You are welcome to request a meeting with me or/and schedule weekly 30 minutes with me (scheduled by individual students). Just send me an email!

Prerequisites: Open to Elementary Education or (pre-ED) majors **only**.

Text: Mathematics for Elementary School Teachers, 5th Edition, by Sybilla Beckmann

Supplies: A scientific calculator is recommended

Course Agenda: Chapters 1-6

Learning Outcomes: Upon successful completion of this course, a student will be able to:

1. Develop as a mathematician and teacher with the ability to explain reasoning (both verbally and in writing) while solving problems, and participating with confidence in mathematical activity,

2. View mathematics as the human activity of structuring the world, by demonstrating knowledge of the historical development of number and number systems including contributions from diverse cultures and its use in describing the world around us,

3. Become a more-central participant in the community of mathematics teachers,

4. Develop a meaning of addition, subtraction, multiplication, and division and provide multiple models for whole number operations and their applications,

5. Recognize commutativity, associativity, distributivity, identities, and inverses as properties of operations on a given domain and appreciate that a small set of rules governs all of arithmetic,

6. Recognize the meaning and use of place value in efficiently representing whole numbers and finite decimals, comparing and ordering numbers, and understand the relative magnitude of numbers,

7. Demonstrate proficiency in and understanding of multi-digit computation using standard and alternative/invented algorithms, mental mathematics, and computational estimation. Explain the difference in understanding required for various algorithmic processes,

8. Analyze integers and rational numbers, their relative size, and how operations with whole numbers extend to integers and rational numbers, and,

9. Evaluate student work regarding numbers and operations, determine the mathematical reasoning and strategies used, and recognize some common mistakes, including the reasoning that makes these mistakes sensible. Formulate feedback and identify instructional activities to further student learning.

Course Assignments:

1. *Homework* assignments are assigned and collected regularly.

2. *Tests*: Test 1 (chapters 1); Test 2 (chapter 2), Test 3 (chapter 3), Test 4 (chapter 4); Test 5 (chapter 5);

3. *Final Exam* two options: You can take the final exam on **Tuesday, December 14th, 8:00-10:00AM**. It will be comprehensive over the whole semester. OR, you can use the average performance of the best 4 of the 5 tests as your final exam performance.

Grading distribution and scale:

The grading distribution will be approximately as follow:

Homework	50%
Tests	35%
Final exam	15%

Grading scale:

93 – 100%	A	90 - 92%	A-		
87 – 89%	B+	83 - 86%	B	80 - 82%	B-
77 – 79%	C+	73 - 76%	C	70 – 72%	C-
67 – 69%	D+	63 - 66%	D	60 - 62%	D-
Below 60%	F				

Test Revision Opportunity

The purpose of education is not to pass exams — the purpose of education is to learn and grow! Making mistakes and learning from them is a key component of the learning process. In this spirit, you may choose to revise your test (entirely open book / open internet) with the opportunity to receive up to 50% of the points back that you missed. To pursue this opportunity, you must critically examine each question that you missed (either partially or fully) on the exam. **First**, you must fully and clearly document your initial misunderstandings. **Second**, you must fully and clearly document the step-by-step process used to arrive at the correct solution. **Third**, you must include pedagogical text in your documentation that could help young learners learn from similar potential challenges and gain a deeper understanding of the material. You may document your initial misunderstandings and revised solutions using words, mathematical notation, and/or diagrams, as applicable.

Timeline: Revision needs to be submitted via Moodle **1 week** after the test is graded and returned back to you.

Administrative Policies:

***Grade**:* You must earn a C- or better in this course to pass the requirement in the College of Education. You may change to CR/NC up to the last day of class and you will receive credit with a grade of D- or better. However, if you choose this option the grade can't be counted towards the College of Education requirement nor the UM graduation requirement.

Digital Access: Digital devices (like laptops and cell phones) are becoming increasingly important to success in college. In this course, you may need digital devices to access readings, complete and submit written assignments, complete online tests/exam, verify your attendance, take in-class polls, coordinate with other students regarding group projects, complete and submit group projects. I recognize that some students are unable to afford the cost of purchasing digital devices and that other students rely on older, more problem-prone devices that frequently break down or become unusable. I also recognize that those technology problems can be a significant source of stress for students. Given those challenges, I encourage students to contact me if they experience a technology-related problem that interferes with their work in this course. This will enable me to assist students in accessing support.

Academic Honesty: All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

Accommodation: The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit www.umt.edu/disability for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

Grounds for Approving Petitions for Late Drops: According to the University catalog, some examples of documented circumstances that may merit approval are accident or illness, family emergency, or other circumstances beyond the student's control. When filling out the Course Drop Form, students are expected to check one of the following:

□ An accident/illness prevented me from meeting course requirements.
□ A family/personal emergence prevented me from meeting course requirements.
□ I received no evaluation of my performance before a drop deadline.
□ Employment schedule changed, preventing me from meeting course requirements.
□ _____

Student Conduct Code: All students need to be familiar with the Student Conduct Code. You can find it in the "A to Z Index" on the UM home page.

SEMESTER SCHEDULE

Monday	Wednesday	Friday
30-Aug Introduction	1-Sep Section 1-1	3-Sep Section 1-2
6-Sep Labor Day	8-Sep Section 1-3	10-Sep Section 1-4 and Review
13-Sep Test 1	15-Sep Section 2-1	17-Sep Section 2-2
20-Sep Section 2-3	22-Sep Section 2-4	24-Sep Section 2-5 and Review
27-Sep Test 2	29-Sep Section 3-1	1-Oct Section 3-2
4-Oct Section 3-3	6-Oct Section 3-4	8-Oct Section 3-5 and Review
11-Oct Test 3	13-Oct Section 4-1	15-Oct Section 4-2
18-Oct Section 4-3	20-Oct Section 4-4	22-Oct MT Educator Conf
25-Oct Section 4-5	27-Oct Section 4-6	29-Oct Section 4-6 and Review
1-Nov Test 4	3-Nov Section 5-1	5-Nov Section 5-2
8-Nov Section 5-3	10-Nov Section 5-4	12-Nov Section 5-4 and Review
15-Nov Test 5	17-Nov Section 6-1	19-Nov Section 6-2
22-Nov Section 6-3	24-Nov Travel Day	26-Nov Holiday
29-Nov Section 6-3	1-Dec Section 6-4	3-Dec Section 6-5
6-Dec Section 6-6	8-Dec Review	10-Dec Review
Final Assessment Tuesday, December 14th, 8:00-10:00		

HOMEWORK ASSIGNMENTS

Section	Problems for Section	Due Date
1.1	3,7,9	8-Sept
1.2	1,2a,7,8a,12	8-Sept
1.3	3,6,10a,11,13,15*	15-Sept
1.4	2,3,4,6	15-Sept
2.2	2,5,7,11,16,18,20*	22-Sept
2.3	1,3,4,10,15,19,25*	29-Sept
2.4	2,3,4,6,7,10,11,18,19*	29-Sept
2.5	3,4,9,10,15,20,22*	29-Sept
3.1	1,3,5	6-Oct
3.2	3,4c,5,6,10	6-Oct
3.3	2,3,4,7,9,12*,14*	13-Oct
3.4	2,3,4,6ac,11,14,27*	13-Oct
3.5	3,4	13-Oct
4.1	1,2,3,4,8,9	20-Oct
4.2	1,2,3,4*	20-Oct
4.3	1,2,6,7,8,10,13,14,20	27-Oct
4.4	5,6,7,8,9,18*	27-Oct
4.5	2,3,7,8,10,12,16,17*	3-Nov
4.6	1,3,4,7,12	3-Nov
5.1	1,3,5,7,8,11,15,19*	10-Nov
5.2	1,3,4,5,6,9	10-Nov
5.3	1,2,3	17-Nov
5.4	1,2,3,5,9,10	17-Nov
6.1	1,2,3,4,5	24-Nov
6.2	1,4,6,7,9,11*	24-Nov
6.3	1,2,3,4,5,8,10,19,25*	8-Dec
6.4	2,4,7,9,11,15,16*	8-Dec
6.5	3,6,7,8,9,10,11	8-Dec
6.6	3,5,6,7,13	Optional

* - indicates optional challenging problem