MTH223-01
Number Systems I
Fall 2022

Class Time and Location: M W 4:30 -5:45 in S 245

Instructor: Marsha Jenkins, B.S.E. +18, Henderson State University
Office Location: Johnson Learning Commons 205
Office Hours: MW 8:00 – 12:00, 1:00 – 4:15
TR 8:30 – 12:00, 1:00 – 5:00
F 8:00 – 2:15
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Resources:
Text: *Mathematics for Elementary Teachers – A Contemporary Approach, 8th Edition,*
Musser, Burger, and Peterson, Copyright 2008. ISBN # 13 – 978 – 0470 – 10583 - 2

Required Materials:
TI-83 or 84 Calculator, paper, 3-ring notebook suggested, two-pocket folder, mechanical pencils with good erasers or FriXion ink pens, small pack colored pencils (preferably erasable) or multiple colors of FriXion pens, straight edge.

Course Description: This course includes influences on and directions in mathematics education, learning theories, problem solving, number concepts, numeration, number theory, and whole-number operations. In addition, fraction and decimal concepts and computation are developed. Ratio, proportion and percent are also studied. Estimation and alternative algorithms are addressed, and mental math strategies are studied and modeled. MTH223 contains mathematics content, teaching techniques, mathematics manipulatives, and technology with emphasis on problem solving, reasoning, communication, connections, and representation. This course is designed for future elementary and middle school teachers.

Program Outcomes: The purpose of the Associate of Arts Program is to provide students with the knowledge and critical thinking skills that will enable students to analyze problems, arrive at intelligent conclusions, and make reasoned choices in their professional and personal lives.

- Students will demonstrate competency in mathematics, including analytical and occupational skills.
- Students will apply technological skills to process information.
- Students will be prepared to compete academically upon transfer to a four-year institution.

Rationale: An objective of post-secondary education is to provide a core of knowledge that is shared with most educated people. By studying and developing a deeper understanding of mathematical concepts and computations, students can better analyze, problem solve, and prepare critical thinking strategies for real world scenarios, and thereby, be better prepared to teach

elementary and middle school students. Technological skills with graphing calculators are necessary to reduce time needed for more complex problems.

Course Objectives: Upon successful completion of MTH 223 Number Systems I, the student should be able to:

1. Construct and explain concrete, pictorial, and abstract models for concepts and operations of sets, whole numbers, fractions, decimals, and percents.
2. Solve real-world applications using numerous strategies.
3. Translate and perform operations in other number bases and numeration systems.
4. Identify and analyze number theory topics including primes, composites, factors, multiples, greatest common factor, and least common multiple.
5. Use thinking strategies to perform mental math, estimation, and non-standard algorithms.

Students will demonstrate mastery of the above objectives by grades of C or above on quizzes, tests, and final exam.

Topical Course Outline:

Chapter 1: Introduction to Problem Solving — Weeks 1 – 2 8/22-8/29
- 1.1 The Problem Solving Process and Strategies
- 1.2 Three Additional Strategies

Chapter 2: Sets, Whole Numbers, and Numeration — Weeks 2-4 8/31 – 9/12
- 2.1 Sets as a Basis for Whole Numbers — No class on 9/5, Labor Day
- 2.2 Whole Numbers and Numeration
- 2.3 The Hindu-Arabic System
- 2.4 Relations and Functions

TEST 1: Chapters 1 and 2, Wednesday, 9/14

Chapter 3: Whole Numbers: Operations and Properties — Weeks 4–6 9/14–9/26
- 3.1 Addition and Subtraction
- 3.2 Multiplication and Division
- 3.3 Ordering and Exponents

Chapter 4: Whole Number Computation — Weeks 6-7 9/28-10/3
- 4.1 Mental Math, Estimation, and Calculators
- 4.2 Written Algorithms for Whole-Number Operations

Chapter 5: Number Theory — Weeks 7-8 10/3-10/12
- 5.1 Primes, Composites, and Tests for Divisibility
- 5.2 Counting Factors, Greatest Common Factor, and Least Common Multiple

TEST 2: Chapters 3 - 5, Monday, 10/12

Chapter 6: Fractions — Weeks 9-11 10/17-10/31
- 6.1 The Sets of Fractions

6.2 Fractions: Addition and Subtraction
6.3 Fractions: Multiplication and Division

TEST 3: Chapter 5 and 6, Monday, 11/2

Chapter 7:	Decimals, Ratio, Proportion, and Percent 7.1 Decimals 7.2 Operations with Decimals 7.3 Ratios and Proportions 7.4 Percent	Weeks 12-13 11/2-11/17

TEST 4: Chapter 7, Wednesday, 11/17

Chapter 8:	Integers 8.1 Addition and Subtraction 8.2 Multiplication, Division, and Order	Week 14 11/28-11/30
Chapter 9:	Rational Numbers, Real Numbers, and Algebra 9.1 The Rational Numbers 9.2 The Real Numbers 9.3 Functions and Their Graphs	Week 14-15 11/30-12/5

TEST 5: Chapters 8 and 9, Monday, 12/5

Important Dates:

September 5 (M)	Labor Day holiday (No classes/offices open)
October 17 (M)	Eight Week (Mid-term) grades due UA Rich Mountain
November 21-25 (M-F)	Thanksgiving holidays (no classes/office open M-W)
December 6 (T)	Last day of classes/Last day to drop with a W
December 7-13 (W-T)	Final Exams
December 14 (F)	Grades due UA Rich Mountain

Course Conduct: The class will be taught using a combination of lecture, group interaction, question and answer approach, and independent study. New topics will be demonstrated using the board, document camera with smart board, and many manipulatives to support development of concepts in a concrete fashion. Students are strongly encouraged to discuss concepts and examples as opportunities are presented during instructor presentation. It is the student's responsibility to inform the instructor when a concept is confusing or otherwise unclear.

UA Rich Mountain Credit Hour Calculator: For every course credit hour, you should expect to spend at least three clock hours per week of concentrated attention on course-related work, including but not limited to time attending class, as well as out-of-class time spent completing homework, seeking help from instructor or tutors, preparing for upcoming quizzes/tests/exam, reviewing material, problem solving, and organizing your notebook. For a three hour course, a typical student should expect to spend at least nine hours per week dedicated to this course. This includes the time spent in class. Please see credit hour calculator attached to end of syllabus.

Course Requirements / Evaluation (Grading):

Tests & Announced Quizzes are **40%** of your final grade.

Test/Quiz Average: Total points earned on tests / total points possible

Daily Grades: Homework assignments, projects, pop quizzes, and attendance with participation are **40%** of your final grade. Attendance is three points per class period with point(s) deducted for tardiness. Absences due to official school activities do not apply. Quarantined students may attend via Zoom to earn attendance points.

Criteria for Homework Credit: Homework must be neat and complete. Each problem assigned has three parts: 1) the original problem complete with figures drawn, 2) <u>all steps or an explanation</u> of how to arrive at the correct answer, and 3) the final answer**.** *Answers alone are not acceptable.* Use pencils or erasable pens and straight edge paper; no ink or ruffles please. Label each page with your name and lesson number in the top, right corner. <u>Leave a blank line between problems.</u> For immediate feedback, you may check your answers for most of the assigned problems in the back of the book. Box your correct answers as you check them. Find and correct any mistakes. *You will not receive credit for any problems not meeting the criteria for credit described above.*
Submit assignments in a two-pocket folder. Completed notes are to follow homework papers. The practice test is to follow the notes. The note taking guide and practice test must be complete for full credit as assignments.

Daily Grades Average: Total points earned on daily grades / total points possible

The **Final Exam** is **20%** of your final grade. The final exam is comprehensive. Problems are similar to chapter test problems.

Final Grade: The final grade for this course will be determined by rounding the following computation:

Test/Quiz Avg. x 0.40 + Daily Grades Avg. x 0.40 + Final Exam Grade x 0.20

The final, letter grades are assigned based on the following percentage scale after rounding the above calculation to the nearest whole number.

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

Attendance / Make-up Policy:

<u>Attendance</u>: Absences and poor class participation usually result in low grades. If you have an unavoidable absence, you should meet with the instructor as soon as possible. You are responsible for instruction missed during class by studying the material in the book, seeking help from the teacher, and by getting class notes from the teacher or another student.

Tests: No make-up exams will be given. If you miss an exam, the missing grade will be replaced by the final exam score at the end of the course. Deliberately missing an exam is not advised due to the comprehensive nature of the final exam and the possibility of missing a future exam. An exception to this rule may be given in the most serious, unavoidable, and documented circumstances.

Homework: Homework folders are due just before taking the exam. Late homework and projects will be penalized by 10% (of the total possible) per day. Late homework will not be accepted after one week.

Cell Phones and Smart Watches: The use of cell phones in the classroom is prohibited. Turn cell phone off or set on vibrate and store in student's belongings during class time. Having a cell phone out during class will result in the loss of 5 attendance points. If you are expecting an emergency call, please, notify the instructor before class. If you receive the call, please, exit the classroom to take the call. You may return to the classroom after the call. During tests, smart watches will also be stored away in student's belongings. See Academic Dishonesty paragraph.

Academic Dishonesty: Any suspicion of academic dishonesty will result in no credit for the assignment in question. Having a cell phone or smart watch in view during a test will result in a zero on the test.

Disability Policy: It is the policy of UA Rich Mountain to accommodate students with disabilities, pursuant to state and federal law. Any student with a disability who needs accommodations should contact the Associate Vice-Chancellor for Student Affairs Office, 479-394-7622, ext. 1460.

Computer and On-Campus Resources: Computer labs with printers are available in several places on campus including the Johnson Learning Commons. UA Rich Mountain offers students assistance with quality tutors available in the Student Support Services (SSS) in the Johnson Learning Commons. You may access www.tutor.com/uarichmountain nights and weekends when SSS is not available.

Title IX and Discrimination Policy: UA Rich Mountain adheres to a policy that enables all individuals regardless of race, color, gender, national origin, age, religion, sexual orientation, veteran's status, or disability, to work and study in an environment unfettered by discriminatory behavior or acts. Harassment of an individual or group will not be condoned, and any person (student, faculty, of staff member) who violates this policy will be subject to disciplinary action.

Harassment that is considered discriminatory includes actions or conduct (verbal, graphic, gestural, or written) directed against any person or group with the intent to demean or create a hostile or threatening environment. It is not the intent of this policy to infringe upon or limit educational, scholarly, or artistic expression. Any person who believes he or she has been discriminated against should contact the Title IX Coordinator to obtain assistance and information concerning the filing of a complaint.

Infectious Diseases:

Face mask policy: Students are encouraged but not required to wear face masks in class and public spaces.

Attendance Policy: For attendance purposes, a student who is displaying symptoms of illness must email: contact.tracing@uarichmountain.edu to determine next steps for an excused absence related to COVID or flu. Contacting an instructor **DOES NOT** start this process or guarantee an excused absence.

Food and Drink: Food and drinks other than plain water are not allowed in the classroom at any time.

Arkansas Clean Air Act: In compliance with the Arkansas Clean Air Act, UA Rich Mountain is a smoke and tobacco free facility. Students and guests are to refrain from the use of all tobacco products while on campus.

Student Misconduct: Students committing misconduct are subject to disciplinary sanction(s) and/or restrictions. Misconduct or prohibited behavior includes, but is not limited to endangerment, harassment, disruption, sexual misconduct, illegal drugs and/or alcohol, fire or safety issues, gambling, property violations, computer violations or other violations as listed in the UA Rich Mountain catalog.

UA Rich Mountain Mission: The University of Arkansas Rich Mountain provides transformative education to all learners.

Change: This syllabus is subject to change as deemed necessary by the instructor.

Credit Hour Requirement Calculator

Course Information			
Department, Course Number	Mathematics	MTH223	
Course Title	Number Systems I		
Credit Hours	3		
Mode of Delivery	Traditional		
Weeks in Part of Term	15		
Level of Reading Material	Advanced/Scientific/Technical (2)		2
Reading Level of Students	Average Student (2)		2
Average Pages per Hour	11		

		Enter either week or term, not both		
Contact Hours		**Hours/Week**	**Hours/Term**	**Total Hours**
Lecture/Recitation			45	45
	Pages Asg'd	**Hours/Week**	**Hours/Term**	
Syllabus Items				

Weekly Homework Assignments		4		60
Prepare for Chapter Tests			12	12
Prepare for Final exam			4	4
Study Assigned Examples	87			7.9
				0
				0
				0
				0
				0
				0
Total Hours				128.9
Required Hours				112.5
Difference				Ok + 16.4