MTH223-01

Number Systems I

Fall 2019

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

Instructor: Paulette Sherrer ED.S Arkansas State University
M.ED Harding University
B.S.E. John Brown University

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Co-requisite: Math 203 College Algebra

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, 1 inch 3-ring notebook, college rule 3 hole paper, 4 notebook tab dividers, graph paper, pocket folder, mechanical pencils, small pack colored pencils, and ruler.

Course Description: This course emphasizes problem-solving strategies for real-world applications appropriate for grades Pre-K through 8. Included is the development of concepts and operations of sets, whole numbers, and fractions; a study of other number bases and numeration systems; mental and written computation; number theory, statistics, probability, geometric shapes, problem solving, and measurement. This course is designed to better prepare 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 computations, students can better analyze, problem solve, and prepare critical thinking strategies for real world scenarios. Technological skills with the graphing calculator are necessary for future math courses.

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, and fractions.
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 journal entries, projects, presentations, portfolio, and final exam.

Topical Course Outline:

Chapter 1:	Introduction to Problem Solving	Week 1	8/19-8/23
	1.1 The Problem Solving Process and Strategies		
	1.2 Three Additional Strategies		
Chapter 2:	Sets, Whole Numbers, and Numeration	Week 2	8/26-8/30
	2.1 Sets as a Basis for Whole Numbers		
	2.2 Whole Numbers and Numeration		
	2.3 The Hindu-Arabic System		
	2.4 Relations and Functions		
Chapter 3:	Whole Numbers: Operations and Properties	Week 3	9/3-9/6
	3.1 Addition and Subtraction		
	3.2 Multiplication and Division		
	3.3 Ordering and Exponents		
Chapter 4:	Whole Number Computation	Week 4	9/9-9/13
	4.1 Mental Math, Estimation, and Calculators		
	4.2 Written Algorithms for Whole-Number Operations		
	4.3 Algorithms in Other Bases		
Chapter 5:	Number Theory	Week 5	9/16-9/20
	5.1 Primes, Composites, and Tests for Divisibility		
	5.2 Counting Factors, Greatest Common Factor, and Least Common Multiple		
Project 1 & Presentation 1 (Review of Chapters 1-5)		Week 6&7	9/23-10/4

Chapter 6:	Fractions	Week 8	10/7-10/11
	6.1 The Sets of Fractions		
	6.2 Fractions: Addition and Subtraction		
	6.3 Fractions: Multiplication and Division		
Chapter 10:	Statistics	Week 9	10/14-10/18
	10.1 Organizing and Picturing Information		
	10.2 Misleading Graphs and Statistics		
	10.3 Analyzing Data		
Chapter 11:	Probability	Week 10	10/21-10/25
	11.1 Probability and Simple Experiments		
	11.2 Probability and Complex Experiments		
	11.3 Additional Counting Techniques		
	11.4 Simulation, Expected Value, Odds, and Conditional Probability		
Chapter 12:	Geometric Shapes	Week 11	10/28-11/1
	12.1 Recognizing Geometric Shapes		
	12.2 Analyzing Shapes		
	12.3 Properties of Geometric Shapes: Lines and Angles		
	12.4 Regular Polygons and Tessellations		
	12.5 Describing Three-Dimensional Shapes		
Chapter 13:	Measurement	Week 12	11/4-11/8
	13.1 Measurement with Nonstandard and Standard Units		
	13.2 Length and Area		
	13.3 Surface Area		
	13.4 Volume		
Project 2 & Presentation 2 (Review of Chapters 6, 10, 11, 12, & 13)		Week 13&14	11/11-11/22
Final Portfolio Due		Week 15	12/2-12/6
Final Exam Week			12/9-12/12

Important Dates:

September 2 (M)	Labor Day
September 16 (M)	Four Weeks grades due
October 14 (M)	Midterm grades due
November 11 (M)	Twelve Weeks grades due
November 27-29 (W-F)	Thanksgiving Holidays
December 6 (F)	Last day of classes/ last day to drop a class with a W
December 9-12 (M-Th)	Final Exams
December 13 (F)	Grades due

Course Conduct: The class will be taught using a combination of group interaction, question and answer approach, lecture, 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):

Syllabus Items	# of Total Items	# of Points an Item	# of Total Points	# of hrs a Week/Total	# of hrs a Term/Total	% of Total Grade
*Attendance		3	100			10%
Journal Entries	15	10	150	2 / 30		15%
Homework	10	10	100	4 / 40		10%
Projects	2	100	200		10 / 20	20%
Presentations	2	100	200		10 / 20	20%
Final Portfolio	1	150	150		10 / 10	15%
Final Exam	1	100	100		4 / 4	10%
			Total = 1000	**Total = 124 hours**		**100%**

*Attendance will be counted as an additional grade, three points accumulating each class period for a total of 100 points. Absences due to official school activities do not apply.

Criteria for Credit: Work must be neat and complete. Each problem assigned has three parts: 1) the original problem complete with figures drawn, 2) all steps or an explanation of how to arrive at the correct answer, and 3) the final answer. ***Answers alone are not acceptable***. Use pencils and straight edge paper; no ink or ruffles please. Write your name and the lesson topic and number at the top of the first page. Leave a blank line between problems. For immediate feedback, you may check your answers for most assigned problems in the back of the book. Find and correct any mistakes. *You will not receive credit for any problems not meeting the criteria for credit described above.*

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

Attendance / Make-up Policy: No make-up exam will be given. Course portfolios are due just before taking the exam. Late portfolios will be penalized. The student is responsible for instruction missed during class by studying the material in the book, seeking help from the teacher and/or student support services, and by getting class notes from the teacher or another student.

Cell Phones: The use of cell phones in the classroom is prohibited. Turn cell phone off or set on vibrate and store it out of sight during class time. ***Cell phones will be taken up during exams.***

Academic Dishonesty: Any suspicion of academic dishonesty will result in no credit for the paper in question.

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) and Learning Enrichment and Counseling Center (LEAC) in the Johnson Learning Commons. You may access www.tutor.com/uarichmountain nights and weekends when SSS is not available.

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 Vice Chancellor for Student Affairs Office, 394-7622, ext. 1460.

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: University of Arkansas Rich Mountain exists to provide all residents of the Ouachita Mountain Region with exemplary educational and enrichment opportunities to improve the quality of life and standard of living.

Crime statistics and information can be located on our webpage: http://www.uarichmountain.edu/at-a-glance/disclosures

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		

Contact Hours	**Hours/Week**	**Hours/Term**	**Total Hours**
Lecture/Recitation		45	45