

MA 113 - STRUCTURE OF MATHEMATICS I: NUMBER SYSTEMS

***READ THIS SYLLABUS CAREFULLY.
YOU ARE RESPONSIBLE FOR KNOWING THIS INFORMATION!***

Prerequisite: MATH 101 (C- or higher) or Placement Examination

Course Description: MATH 113 is the first in a two-course sequence for Elementary, Early Childhood, Middle Level and Special Education certification candidates (MATH 113/MATH 213). Course content includes a problem solving approach to inductive reasoning, sets, numeration, number theory, integer properties and operations, and rational number properties. No credit is given to those with credit for MATH 366. It can be used to meet requirements of a major or minor in mathematics only for students seeking elementary, early childhood, middle level or special education certification. It is not recommended for use in meeting certification requirements for secondary school mathematics. No student is permitted to use both MATH 105 and 113 to satisfy the General Education requirements.

The major goals of this course are to:

- a. develop and use problem solving strategies
- b. develop number concepts and operations with extensive use of manipulatives and
- c. encourage mathematical discourse through written assignments and cooperative learning.

This course will teach you to think critically in mathematics and about mathematics education.

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Office Hours: Monday 2:00pm – 4:00pm
Wednesday 9:00am – 11:00am
Thursday 1:00pm – 3:00pm (9/2, 9/16, 9/30, 10/14, 10/28, 11/11, 11/18, 12/2)
and by appointment

Textbook: Mathematics for Elementary School Teachers, 4th edition, by Tom Bassarear (Houghton Mifflin Company, 2008)
Mathematics for Elementary School Teachers (Explorations), 4th edition, by Tom Bassarear (Houghton Mifflin Company, 2008)

Note: The two books listed above are sold as a package at the bookstore. The package also includes manipulatives.

Class Meeting Times: MWF 11:00am – 11:50am Maria Sanford 119
Attendance will be taken

Course Requirements: Attend and participate in class regularly, complete assignments, maintain a portfolio, observe two elementary school mathematics lessons, interview an elementary student, and take quizzes and tests as scheduled. All work to be handed in must be written neatly in pencil. I will ask for illegible work to be rewritten. Quizzes and homework cannot be made up. If you know you will be absent, you may take a quiz early and hand in homework early. Missed tests must be made up by the next class meeting. A general rule for any college course is that you are expected to put in at least 2 hours of work outside of class for every hour in class. All electronic devices must be turned off before entering the classroom. If a cell phone rings during class or any text-messaging activity occurs, a percentage point will be deducted from your test average. The classroom is a calculator-free zone.

Attendance Policies:

- a. You are expected to attend every class. When you are teachers, you will expect your students to be present each day.
- b. In the case of an unavoidable absence, please notify me in advance of the date, or, if that is impossible, phone or e-mail me at the time of the absence.
- c. Attendance and class participation are part of your grade in this course. They are evaluated in this manner:

Three or fewer absences and enthusiastic class participation:	85% - 100%
Four or five absences and occasional class participation:	75% - 85%
Six to eight absences and little class participation:	50% - 75%
More than eight absences and no class participation:	0%

University Policies:

- a. You must take the final examination at the time specified in the course selection book.
- b. If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. My telephone number and office hours are given above.
- c. In the event of a weather or other emergency curtailment or cancellation of classes, listen to WTIC (1080 AM), call 860-832-3333 for any messages, or visit the CCSU website.
- d. In the event that I am not in the classroom when class is scheduled to begin, you should wait a full 10 minutes before leaving the classroom.
- e. The last day to withdraw from a course and receive the grade of “W” is October 25th. Approvals for withdrawal prior to this date are not required; however, it is strongly recommended that you consult with your academic advisor prior to deciding to withdraw. Cessation of attendance, notice to the instructor, or telephone calls to the Enrollment Center are not considered official notice of your intention to drop the course. After October 25th withdrawals are allowed only under extenuating circumstances and require approval of the course instructor, department chair and dean of the School of Arts and Sciences.

Resources Available:

- a. If you need help, take advantage of my office hours. Do not wait until just before a quiz or test to do so.
- b. The Learning Center is located in Room 241 Copernicus. Free tutoring is available.
- c. Form a study group with other students in your section. Explaining solutions to homework exercises, investigations, and explorations to each other and preparing for quizzes and tests together are good ways to learn.
- d. A list of private tutors for hire is available in the math department office, Room 107 Marcus White, 832-2835.

Evaluation:

a. Attendance and class participation	10%
b. Homework	10%
c. Portfolio	10%
d. Classroom observations and interview	10%
e. Average of five best quizzes	20%
f. Average of three tests	20%
g. Final examination (Monday, December 13 th 11:00 am – 1:00 pm)	20%

Academic Integrity:

The CCSU honor code for Academic Integrity is in effect in this class. You may find it online at <http://web.ccsu.edu/academicintegrity/UndergradAcadMisconductPolicy.htm>. Please read it carefully. As this policy clearly states, plagiarism and other forms of cheating are forbidden. All writing and other creative work you submit in this class must be your own. Academic integrity is the responsibility a student assumes for submitting academic work as his/her own. Cheating or plagiarism on any test, quiz, final exam, or assignment will result in a grade of zero for that work. Cheating or plagiarism is submitting someone else's work for one's own work. It is different from sharing work with others during class or on group projects.

HOMEWORK

Homework is an opportunity to practice applying concepts learned in class and to communicate mathematical thinking. How you present your homework is a reflection of how you think and work mathematically and your attitude towards mathematics. Here is a list of how I would like for you to complete and submit your homework this semester.

1. Write all homework in pencil.
2. Do not submit any homework on paper torn from a spiral notebook unless the paper is perforated.
3. Put your name and the due date in the upper right-hand corner of the paper.
4. Identify from which page(s) the work comes.
5. Write neatly and legibly. Illegible homework will not be reviewed or graded.
6. Number and write out each exercise (or some identifying information about the exercise if it is long) before doing any work on the exercise.
7. **SHOW YOUR WORK.** An answer without any work does not show your thinking.
8. Leave one empty line between exercises and do not have more than one column of work on a page.
9. When homework is on more than one sheet of paper, staple the sheets together.
10. Be sure to submit homework at the beginning of class the day it is due. Late homework is not accepted. If you cannot attend class, you may hand in homework ahead of time or have a friend bring your homework to class or my office.

Topics Considered - Tentative Schedule

	In Class Work	Homework Readings		Written Homework Assignments	
Topic	Explorations	Assignment	Investigations	Assignment	Explorations
Getting Comfortable with Math		pp. 1-16	1.1, 1.2	p. 26,27 #1,6,7,9	Handout
Problem Solving		pp. 16-26	1.3	p. 27 #16,18,20	
Patterns and Representations	1.3	pp. 30-44	1.5	pp. 27-28 #21,23,26,28,29	
Reasoning and Proof	π	pp. 44-47	1.8,1.9	pp. 28-29 #30,34,36	
Communication		pp. 48-54	1.14	pp. 54-56 #2,14-16,28,32 a,b	
Connections		pp. 61-76	1.15	pp. 55-58 #6-10 a,b,c,11,32 c,d,e	
Sets		pp. 80-96	2.3	pp. 76-78 #3,5,12,13,18	
Algebraic Thinking and Functions			2.7	p. 98 #17,18,21	2.3 (1-3)
Algebraic Thinking and Functions	Filling funnel	pp. 101-118	2.8,2.9	pp. 98-99 #16,19,29,34	2.5
Numeration	2.7			pp. 119-120 #2,3,5,6,7,11,12,15,16,17 a-e	
Numeration					
Test 1		pp. 127-150			
Adding		pp. 152-166	3.2	pp. 150-151 #6,9,10,13,16	3.1
Mental Addition	3.2			p. 151 #11,12,18	
Subtracting		pp. 168-185		pp. 166-167 #5,10,15,18,24	3.3
Multiplying	24GAME	pp. 189-207	3.13	p. 186 #7,15,19,22 a-g	
Mental Multiplication	3.13		3.20	pp. 187-188 #30,31,38	
Dividing		pp. 215-229		pp. 206-208 #2,6,8,11,14,29 a,b,d	
Number Theory – Odd & Even Numbers			4.5	pp. 229-230 #3,4,11,12	
Number Theory – Divisibility Rules		pp. 232-239	4.8	pp. 230-231 #16,17,20,22	4.3

Topic	In-class Explorations	Assignment	Investigations	Assignment	Explorations
Prime and Composite Numbers				p. 239 #4,5,7,11a	
Fundamental Theorem of Arithmetic		pp. 241-251	4.11	p. 240 #13,15a,16	
Greatest Common Factor			4.12	p. 252 #1,2,5,16	
Least Common Multiple				p. 252 #3,4,6,7, 11,12,14	4.5 (1-4)
Test 2		pp. 255-265			
Integers		pp. 267-281	5.1,5.2	pp. 265-266 #2,4,6,10,11,20	
Fractions	Units		5.3,5.4	pp. 281-282 #1,3,4,9,13,14	5.5
Fractions			5.7	pp. 282-283 #17,19,22,24,25	5.7
Fractions		pp. 284-303	5.10	p. 283 #29,32,33	5.8
Fractions	5.11		5.11	pp. 303-304 #3,5,6,8,12,17	5.10
Fractions	Multiplying with paper		5.12	pp. 304-305 #18,20,33,36	
Fractions		pp. 308-331	5.23	p. 306 #44,45,50,51	5.13,5.14
Decimal and Exponents				pp. 331-332 #11,20,22,28-30	
Square Roots and Real Numbers		pp. 337-353		pp. 332-334 #28,35,40,49	
Proportional Reasoning			6.2	pp. 354-355 #3,5,8,15,20	6.2(3)
Proportional Reasoning			6.5	pp. 355-356 #24,28,33,37	
Proportional Reasoning					
Test 3		pp. 357-373	6.14		
Percents	6.5			p. 374 #5,6,8,9,15	6.7 (1)
Percents				p. 374-376 #16,18,20,27,39	
Review for Final Exam					
Review for Final Exam					