

# ROWAN UNIVERSITY

Department of Mathematics

## Syllabus

### MATH 01201 01 Structures of Mathematics – Fall 2008

#### COURSE INFORMATION

1. **Professor:** Dr. Carol Rodano
2. **Meeting Time & Place:** ROB 101A, Wed. 6:30 P.M. to 9:00 P.M.
3. **Phone:** 856-256-4844
4. **E-Mail Address:** rodanoc1@verizon.net
5. **WEB Page Address:**  
<http://www.rowan.edu/colleges/las/departments/math/facultystaff/adjuncts/rodano/index.html>
6. **Office Hours:** W (email to make an appointment)

#### CATALOG DESCRIPTION

This course concerns the development of number systems and algebraic structures, including the natural numbers, the integers, rational numbers, real and complex numbers. Concrete examples of selected algebraic structures such as modular arithmetic and matrices are also included. Students will be required to reason mathematically, solve problems, and communicate mathematics effectively at different levels of formality, using a variety of representations of mathematical concepts and procedures. Use of calculators is required. Students are expected to have completed an equivalent of Intermediate Algebra.

#### TEXT and OTHER SUPPLIES REQUIRED

##### Required Texts:

*Mathematics for Elementary Teachers: A Conceptual Approach* (7<sup>th</sup> Ed.) by Bennett, Burton and Nelson, McGraw-Hill Higher Education, 2007.

*Mathematics for Elementary Teachers: An Activity Approach* (7<sup>th</sup> Ed.) by Bennett, Burton, and Nelson, McGraw-Hill Higher Education, 2007.

(Includes manipulative Kit- bring to each class)

**Calculator:** The Texas Instruments Math Explorer Plus is the recommended calculator for this course. Students may NOT use a cell phone as a calculator.

#### EVALUATION

| Graded Activity   | Percentage |
|---|------------|
| Quizzes (5-drop lowest), Reading Checks (11-drop lowest) & Homework Assignments (collect 3 times) | 30%        |
| Midterm Exam 1 (Chapters 1 & 2)   | 20%        |
| Midterm Exam 2 (Chapters 3 & 4)   | 20%        |
| Final Exam (Cumulative – Chapters 1 through 6)  | 30%        |

**Grading:** A 93%, A- 90%, B+ 87%, B 83%, B- 80%, C+ 77%, C 73%,  
C- 70%, D+ 67%, D 63%, D- 60%, F less than 60%

**Reading Checks:** These assignments will involve the student writing (in his or her own handwriting) a 1-2 page summary of the reading assignment to be collected at the beginning of each class. Completeness, neatness and grammar count.

**Homework Assignments:** Homework assignments must be done in **pencil** in a spiral notebook to be handed in three times during the semester (at the beginning of each class during exam #1, exam #2 and final exam). **Each assignment** must be clearly marked with page numbers and problem numbers at top of each page. **Neatness** will be counted.

**Manipulatives and Online Activities:** Students may use their manipulatives during quizzes and exams. Materials are available online at the *Mathematics for Elementary Teachers* textbook Website:

[http://highered.mcgraw-hill.com/sites/0073022845/student\\_view0/](http://highered.mcgraw-hill.com/sites/0073022845/student_view0/)

**Absences:** Any student absent during an in-class scheduled examination/quiz/reading check will receive a grade of zero for that exam/quiz/reading check unless a phone call was placed to the professor **before** the exam/quiz/reading checks and an excused absence (medical emergency, illness, death in the family) is given.

**Class Participation:** Students are expected to participate in small-group and whole-class discussions as a means of promoting their own learning and contributing to the progress of the classroom community. Sharing, critiquing and discussing ideas are part of class participation. **Class participation requires that a student be in class, on time for class, and prepared for class which includes having the reading assignments and homework completed.**

## **COURSE OBJECTIVES**

This course is intended to provide students with the opportunity to develop their knowledge of the content and discourse of mathematics, including:

- mathematical concepts and procedures and the connections among them;
- multiple representations of mathematical concepts and procedures;
- ways to reason mathematically, solve problems, and communicate mathematics effectively at different levels of formality;
- the nature of mathematics, the contributions of different cultures toward the development of mathematics, and the role of mathematics in culture and society;
- the changes in the nature of mathematics and the way we teach, learn, and do mathematics resulting from the availability of technology;
- the place of “school mathematics” (what students have learned in elementary school and high school) within the discipline of mathematics;
- the relationship of mathematics to other subjects and its application in society.

## **STUDENTS ACCOMMODATION POLICY**

Your academic success is important. If you have a documented disability that may have an impact upon your work in this class, please contact me. Students must provide documentation of their disability to the Academic Success Center in order to receive official University services and accommodations. The Academic Success Center can be reached at 856-256-4234. The Center is located on the 3<sup>rd</sup> floor of Savitz Hall. The staff is available to answer questions regarding accommodations or assist you in your pursuit of accommodations. We look forward to working with you to meet your learning goals.

## TENTATIVE COURSE SCHEDULE AND ASSIGNMENTS

“A” – *An Activity Approach* textbook

“C” – *A Conceptual Approach* textbook

| Class Day | Date     | In-class Activities<br>“A”  | Homework (due next class)<br>“C”   | Important Dates  |
|-----------|----------|---|--|--|
| 1         | 9/3/08   | A. 1.1 Problem Solving (Polya); Tower Puzzle                          | Punch out manipulatives and cut out Material Cards 13 & 16<br><b>Read #1: C 1.1 pp. 3-12 and read complete syllabus</b>                          |  |
|           |          | A. 1.1 Pattern Blocks   | C. 1.1 (PP.14-17) #3,5, 13, 17, 21)<br><b>Read #1: C. 1.2 pp. 20-29</b>  |  |
| 2         | 9/10/08  | A. 1.2 Color Tiles  | C.1.2 (pp. 30-35) #1,3,5,9,12,13, 17, 18, 28, 29)<br><b>Read #2: C. 1.3 pp. 37-48</b>  | <b>Reading Check #1 due</b>                              |
|           |          | A. 1.3 Algebra Pieces   | C. 1.3 (pp. 50-51) #6 to 17<br><b>Read #2: 2.1 pp. 61-70</b>   |  |
| 3         | 9/17/08  | A. 1.3 Algebra Pieces   | C. 1.3 (pp. 51-54) #19, 23,25, 27, 29, 35  | <b>Reading Check #2 due</b><br>QUIZ#1 (1.1 & 1.2)        |
|           |          | A. 2.1 Sets & Venn Diagrams   | C. 2.1 (pp. 73-75) #5, 7, 9, 11, 15, 21,23, 25, 27, 31, 33, 35, 37, 41<br><b>Read #3: C. 2.2 pp. 78-93</b><br><b>C. 3.1 pp. 125-126, 131-135</b> |  |
| 4         | 9/24/08  | A. 2.1 Sets & Venn Diagrams   |  | <b>Reading Check #3 due</b>                              |
|           |          | A. 2.2 Functions, Coordinates & Graphs                                | C. 2.2 (pp. 94-102) #1, 3, 7, 15, 17, 19, 21, 23, 25, 27, 35, 37<br><b>Read #4: C. 3.1 pp. 135-137</b>   |  |
| 5         | 10/1/08  | A. 3.1 Multi-base Pieces  | C. 3.1 (pp. 138-139) #5, 7, 9, 11, 29b, 29c, 29d   | <b>Reading Check #4 due</b><br>QUIZ #2 (1.3, 2.1, & 2.2) |
|           |          | A. 3.1 Multi-base Pieces<br>Study Guide provided for Midterm Exam #1. | C. 3.1 (pp. 139-141) #21, 23, 25, 27, 33, 35, 39, 41<br><b>Read #5: C. 3.2 pp. 143-149</b>   |  |
| 6         | 10/8/08  | <b>MIDTERM EXAM #1 (Ch. 1 &amp; 2)</b>                                | <b>Read #5: C. 3.2 pp. 149-156</b>   | <b>*MIDTERM EXAM #1 (Ch. 1 &amp; 2) Homework Due</b>     |
| 7         | 10/15/08 | A. 3.2. Adding/Subtracting Multi-base Pieces                          | C. 3.2 (pp. 158-162) #3, 5, 7, 13, 15, 17, 25, 43, 45, 51<br><b>Read #6: C. 3.3 pp. 164-179</b>  | <b>Reading Check #5 due</b>                              |
|           |          | A. 3.3 Multiplying Base-Ten Pieces                                    | C. 3.3 (pp. 180-183) #5, 7, 9, 13, 15, 17, 23, 43, 45, 47<br><b>Read #6: C. 3.4 pp. 187-202</b>  |  |

|    |          |   |  |   |
|----|----------|---|--|---|
| 8  | 10/22/08 | A. 3.4 Dividing Base-Ten Pieces   | C. 3.4 (pp. 203-204) #1, 3, 5, 7, 11, 13, 15, 17, 21, 23, 25, 27,29<br><b>Read #7: C. 4.1 pp. 215-228</b>  | <b>Reading Check #6 due</b><br>QUIZ #3 (3.1 & 3.2)                              |
|    |          | A. 4.1 Number Theory  | C. 4.1 (pp. 230-232) #11, 41<br><b>Read #7: C. 4.2 pp. 235-247</b>   |   |
| 9  | 10/29/08 | A. 4.2 Number Theory Even, Odd, Factors, Primes   | C. 4.1 (pp. 229-231) #3, 5, 7, 17, 25, 27, 29  | <b>Reading Check #7 due</b>   |
|    |          | A. 4.2 Number Theory GCF & LCM  | C. 4.2 (pp. 248-249) #1, 3, 5, 7, 9, 11, 13, 15, 21, 25, 27, 29<br><b>Read #8: C. 5.1 pp. 257-274</b>  |   |
| 10 | 11/5/08  | A. 5.1 Black & Red Tile Models for Integers   | C. 5.1 (pp. 276-278) #1, 3, 5, 7, 9, 11, 13, 17, 21, 23, 25, 29, 33, 35, 37<br><b>Read #9: C. 5.2 pp. 282-301</b>  | <b>Reading Check #8 due</b><br>QUIZ #4 (3.3, 3.4, & 4.1)                        |
|    |          | A. 5.2 Fraction Bar Model for Equality & Inequality<br>A. 5.3 Computing with Fraction Bars<br><br>Study Guide provided for Midterm Exam #2. | C. 5.2 (pp. 303-307) #3, 5, 9, 11, 13, 19, 21, 23, 25, 27, 29, 31, 33, 41, 43, 49, 51<br><b>Read #9: C. 5.3 pp. 310-327</b><br>C. 5.3 (pp. 329-332) #7, 15, 19, 21, 29, 37, 39, 47 |   |
| 11 | 11/12/08 | <b>Midterm Exam #2 (Ch. 3 &amp; 4)</b>  | <b>Read #9: C. 6.1 pp. 341-357</b>   | <b>*MIDTERM EXAM #2 (Ch. 3 &amp; 4) Homework Due</b>                            |
| 12 | 11/19/08 | A. 6.1 Decimals: Rational and Irrational  | C. 6.1 (pp. 359-360) #13, 15, 17, 19, 37   | <b>Reading Check #9 due</b>   |
|    |          | A. 6.1 Decimals: Rational and Irrational  | C. 6.1 (pp. 359-362) #5, 7, 11, 21, 23, 31, 33, 35, 39, 42, 45, 49<br><b>Read #10: C. 6.2 pp. 364-380</b><br><b>C. 6.3 pp. 389-404</b>   |   |
| 13 | 11/26/08 | A. 6.2 Operations with Decimal Squares  | C. 6.2 (pp. 383-386) #13, 15, 19, 25, 37, 39, 41, 45<br><b>Read #11: C. 6.4 pp. 413-425</b>  | <b>Reading Check #10 due (Optional)</b><br>QUIZ #5 (5.1, 5.2, & 5.3) (Optional) |
|    |          | A. 6.3 Model for Percent  | C. 6.3 (p. 406-407) #3, 5, 11,13, 15, 17 19, 21, 23, 29, 31, 33, 35  |   |
| 14 | 12/3/08  | A. 6.4 Irrational Numbers on the Geoboard   | C. 6.4(pp. 427-428) #1, 5b, 7a, 9, 13  | <b>Reading Check #11 due</b>  |
|    |          | Study Guide for Final Exam provided.  |  |   |
| 15 | 12/10/08 | <b>FINAL EXAM (Cumulative – Ch. 1-6)</b>  |  | <b>FINAL EXAM (Cumulative– Ch. 1 to 6) Homework Due</b>                         |