

NEW RIVER COMMUNITY COLLEGE

DUBLIN, VIRGINIA

COURSE PLAN

Course Number and Title: MTH 02 – Arithmetic

Prepared by: Math Department
(Instructor)

Spring, 2008
(Date)

Approved by: _____
(Interim Dean)

Spring, 2008
(Date)

I. Course Description

Covers arithmetic principles and computations including whole numbers, fractions, decimals, percents, measurement, graph interpretation, geometric forms, and applications. Develops the mathematical proficiency necessary for selected curriculum entrance. Credits not applicable toward graduation.

II. Introduction

MTH 02 is an individualized or lectured course in basic arithmetic and pre-algebra which bridges the gap between a weak mathematical foundation and the knowledge necessary for the study of mathematics in technical and professional programs. Students may re-register for this course in subsequent semesters as necessary until the course objectives are completed.

III. Specific Objectives

Students will complete the following:

Objective 1

Chapter 1 – The Whole Numbers

1. Find the place value of a digit in a whole number.
2. Write a whole number in words and in standard form.
3. Write the expanded form of a whole number.
4. Read tables.
5. Add, subtract, multiply and divide whole numbers.
6. Find the perimeter of a polygon.
7. Solve problems by adding, subtracting, multiplying and dividing whole numbers.
8. Round whole numbers.
9. Use rounding to estimate sums, differences, product and quotients.

10. Solve problems by estimating.
11. Find the area of a rectangle.
12. Use the properties of multiplication.
13. Find the average of a list of numbers.
14. Solve problems that require more than one operation.
15. Write repeated factors using exponential notation.
16. Evaluate expressions containing exponents.
17. Use the order of operations.
18. Find the area of a square.

Objective 2

Chapter 2 — Multiplying and Dividing Fractions

19. Identify the numerator and denominator of a fraction.
20. Write a fraction or mixed number to represent the shaded part of a figure.
21. Identify proper fractions, improper fractions and mixed numbers.
22. Write mixed numbers as improper fractions and improper fractions as mixed or whole numbers.
23. Find the factors of a number.
24. Identify prime and composite numbers.
25. Find the prime factorization of a number.
26. Write a fraction in simplest form or lowest term.
27. Determine whether two fractions are equivalent.
28. Multiply and divide fractions.
29. Multiply and divide fractions and mixed numbers or whole numbers.
30. Solve problems by multiplying or dividing fractions.
31. Find the reciprocal of a fraction.

Objective 3

Chapter 3 — Adding and Subtracting Fractions

32. Add and subtract like fractions.
33. Find the least common multiple (LCM) of a list of numbers.
34. Write an equivalent fraction with a given denominator.
35. Add and subtract unlike fractions.
36. Add and subtract mixed numbers.
37. Solve problems by adding or subtracting fractions or mixed numbers.
38. Compare fractions.
39. Evaluate fractions raised to powers.
40. Simplify expressions containing fractions using the order of operations.

Objective 4

Chapter 4 — Decimals

41. Know the meaning of place value for a decimal number and write decimals in words.
42. Write decimals in standard form.

43. Write decimals as fractions and fractions as decimals.
44. Add, subtract, multiply, and divide decimals.
45. Solve problems involving adding, subtracting, multiplying or dividing decimals.
46. Multiply and divide by powers of 10.
47. Find the circumference and area of a circle.
48. Round decimals to a given place value.
49. Estimate operations on decimals.
50. Simplify expressions containing decimals using the order of operations.
51. Write fractions as decimals.
52. Compare fractions and decimals.
53. Solve area problems containing fractions and decimals.

Objective 5 - Scientific Calculator (Handout)

54. Perform basic operations on the TI36X scientific calculator.
55. Use a scientific calculator efficiently and accurately to solve a variety of problems.

Objective 6

Chapter 5 — Ratio and Proportion

56. Write ratios and rates as fractions in simplest form.
57. Find unit rates and unit prices.
58. Use unit prices to decide which item is the best buy.
59. Determine whether proportions are true.
60. Find an unknown number in a proportion.
61. Solve application problems by writing proportions.

Objective 7

Chapter 6 — Percent

62. Write percents as decimals and fractions.
63. Write decimals and fractions as percents.
64. Write percent problems as proportions and solve.
65. Solve percent applications including sales tax, commissions, and discounts using proportions.
66. Find percent increase and percent decrease.

Objective 8

Chapter 7 — Measurement

67. Define U.S. units of length, weight, and capacity and convert from one unit to another.
68. Perform arithmetic operations on U.S. units of length, weight and capacity.
69. Define the metric units of length, weight (mass) and capacity and convert from one unit to another.
70. Perform arithmetic operations of metric units of length, weight (mass) and capacity.
71. Convert temperature between degrees Celsius and degrees Fahrenheit.

Objective 9

Chapter 8 — Geometry

72. Identify lines, line segments, rays, angles, complementary angles and supplementary angles.
73. Classify angles as acute, right, obtuse or straight.
74. Find measures of angles.
75. Identify plane figures and solid figures.
76. Find the perimeter or circumference of plane geometric figures.
77. Find the area of geometric figures.
78. Find the volume of solids.
79. Find the square root of a number.
80. Use the Pythagorean Theorem to find the missing side of a right triangle.

Objective 10

Chapter 9 — Statistics and Probability

81. Read pictographs, bar graphs, line graphs and circle graphs.
82. Construct bar graphs and circle graphs.
83. Read and construct histograms.
84. Find the mean, median, and mode of a list of numbers.
85. Find a student's grade point average.

Objective 11 — Algebra

Chapter 10 — Signed Numbers & Chapter 11 — Introduction to Algebra

86. Graph signed numbers on a number line.
87. Compare signed numbers.
88. Find the absolute value and the opposite of a signed number.
89. Add, subtract, multiply, and divide signed numbers.
90. Simplify expressions involving signed numbers using the order of operations.
91. Evaluate algebraic expressions for given replacement values for the variables.
92. Use properties of numbers to combine like terms and to multiply expressions.
93. Solve first degree equations in one unknown.

IV. Instructional Procedure

MTH 02 is organized by objectives with assignments specific for each objective. Instruction will be a combination of individual work, computer instruction and group work. Each student will move from one objective to the next at his or her own pace. Objectives must be completed in the order shown on the MTH 02 Assignment Schedule.

V. Instructional Materials

Textbook: Basic College Mathematics, 2nd Edition
Author: K. Elayn Martin-Gay
Date: 2003
Publisher: Prentice-Hall, Inc.
Scientific Calculator: TI36X preferred

Other: Metric/English Ruler
 Protractor
 2" (or larger) three-ring binder
 Notebook paper
 Pencils

Additional resource materials for some New River Community College classes can be found on the NRCC Web-based learning site at nr.edu/learninglinks.

Instructor Materials

1. Handout are available for each section.
2. Book specific computer software
3. Handout for Objective 5 - Scientific Calculator.

Disability Statement: If you are a student with a documented disability who will require accommodations in this course, please register with the Disability Services Office located in the Counseling Center in Rooker Hall for assistance in developing a plan to address your academic needs.

Diversity Statement: The NRCC community values the pluralistic nature of our society. We recognize diversity including, but not limited to, race, ethnicity, religion, culture, social class, age, gender, sexual orientation and physical or mental capability. We respect the variety of ideas, experiences and practices that such diversity entails. It is our commitment to ensure equal opportunity and to sustain a climate of civility for all who work or study at NRCC or who otherwise participate in the life of the college.

VI. Course Content

Objective 1 — Chapter 1: The Whole Numbers
Objective 2 — Chapter 2: Multiplying and Dividing Fractions
Objective 3 — Chapter 3: Adding and Subtracting Fractions
Objective 4 — Chapter 4: Decimals
Objective 5 — Scientific Calculator (Handout)
Objective 6 — Chapter 5: Ratio and proportion
Objective 7 — Chapter 6: Percent (Sections 6.1, 6.2, 6.4-6.6)
Objective 8 — Chapter 7: Measurement (Sections 7.1 - 7.4)
Objective 9 — Chapter 8: Geometry
Objective 10 — Chapter 9: Statistics (Sections 9.1-9.4)
Objective 11 — Chapter 10: Signed Numbers
 Chapter 11: Introduction to Algebra (Sections 11.1-11.4)

VII. Evaluation

There are five factors in grading — quizzes(tentative), tests, midterm exam, final exam and attendance.

Quizzes (Tentative)

There are 10 quizzes each valued at 5 points. Each quiz will consist of 10 questions and will include the material specified in the MTH 02 Assignment Schedule. The student will take the Quiz when he completes the material. Quizzes cannot be retaken. The quiz average is computed by points earned divided by possible points times 100.

Tests

For each objective there is a twenty-five (25) question test. Each student must take an Objective Test on each of the 10 objectives. The student must demonstrate mastery on each of these objectives. The passing score on Form A (first try) is 85. In subsequent tries, the student is required to earn at least a score of 90 in order to show mastery of that objective.

Midterm

The midterm exam covers Chapters 1-4. This midterm exam consists of 25 questions and cannot be retaken. A calculator cannot be used.

Final Exam

All students are required to take a customized final exam. There will be about five (5) questions from each chapter that the student has completed. Chapters #1-4, no calculator can be used.

Attendance

The college withdrawal policy will be followed. If a student is tardy for class or leaves class early, an absence for that day may be recorded.

Final Grades

Grades will be determined by using the following procedure:

$$.75 \text{ (average of quizzes (if given), chapter test scores, and midterm exam)} \\ + .25 \text{ (final exam score)}$$

(A) For a student completing all objectives:

85-100 = S (Satisfactory)
Below 85 = U (Unsatisfactory)

(B) For a student not completing all objectives an R grade may be given if:

1. The student has completed at least Objectives #104, Quizzes #1-8, the Midterm Exam and the customized Final Exam.
2. The student has at least an 85 average using the following procedure:

$$.75 \text{ (average of quizzes taken, objective test scores and midterm exam score)} + .25 \\ \text{(final exam)}$$

The student may re-enroll in MTH 02 the following semester and complete the remaining objectives.

(C) For a student completing Objectives #1-10, an I (Incomplete) grade may be assigned. The student will receive an I if:

1. The student has completed Quizzes #1-18, Objectives #1-10, the midterm and final exam.
2. The student has at least an 85 average using the following procedure:

$.75$ (average of quizzes taken, Objective Tests #1-10, and Midterm Exam) + $.25$ (Final Exam thru Objective #10)

A grade of I must be completed independently with the instructor during the following semester. The student will not re-enroll in MTH 02.

(D) For a student who is re-enrolling from a previous semester:

The grade will be determined using the following procedure:

$.75$ (average of quizzes and objective test scores taken this semester) + $.25$ (customized final exam)

1. If the student completes all remaining objectives:
85 - 100 = S (Satisfactory)
Below 85 = U (Unsatisfactory)
2. In order to receive another R, the student must complete at least four (4) objectives with at least an 84 average.

VIII. Withdrawal Policy

Student Initiated Withdrawal Policy

A student may drop or withdraw from a class without academic penalty during the first sixty percent (60%) of a session. For purposes of enrollment reporting, the following procedures apply:

- a. If a student withdraws from a class prior to the termination of the add/drop period for the session, the student will be removed from the class roll and no grade will be awarded.
- b. After the add/drop period, but prior to completion of sixty percent (60%) of a session, a student who withdraws or is withdrawn from a course will be assigned a grade of "W." A grade of "W" implies that the student was making satisfactory progress in the class at the time of withdrawal, that the withdrawal was officially made before the deadline published in the college calendar, or that the student was administratively transferred to a different program.
- c. After that time, if a student withdraws from a class, a grade of "F" or "U" will be assigned. Exceptions to this policy may be made under documented mitigating circumstances if the student was passing the course at the last date of attendance.

A retroactive grade of “W” may be awarded only if the student would have been eligible under the previously stated policy to receive a “W” on the last date of class attendance. The last date of attendance for a distance education course will be the last date that work was submitted.

Late withdrawal appeals will be revised and a decision made by the Director of Student Services.

Instructor Initiated Withdrawal Policy

A student who adds a class or registers after the first day of class is counted absent from all class meetings missed. Each instructor is responsible for keeping a record of student attendance in each class.

Students who have not attended class or picked up/accessed distance learning materials by the last day to drop class and receive a refund must be withdrawn by the instructor during the following week. No refund will be applicable.

Since attendance is not a valid measurement for Distance Education (DE) courses, students may be withdrawn due to non-performance. Students should refer to his/her DE course plan for the instructor’s policy.

When a student's absences equal twice the number of weekly meetings of a class (equivalent amount of time for summer session), the student may be dropped for unsatisfactory attendance in the class by the instructor.

When an instructor determines that absences constitute unsatisfactory attendance, an Instructor Withdrawal Form should be completed and submitted to the Admissions and Records Office within five days of when the student met the withdrawal criteria. The last date of attendance must be documented. A grade of "W" will be recorded during the first sixty percent (60%) period of a course. Students withdrawn after the sixty percent (60%) period will receive a grade of "F" or “U” except under documented mitigating circumstances when a letter of appeal has been submitted by the student. A copy of this documentation must be placed in the student's academic file.

The student will be notified of the withdrawal by the Admissions and Records Office. An appeal for reinstatement into the class may be approved only by the instructor.