

NEW RIVER COMMUNITY COLLEGE

DUBLIN, VIRGINIA

COURSE PLAN

Course Number and Title: MTH 151 – Mathematics for the Liberal Arts I

Prepared by: Pablo Chalmeta Spring, 2010
(Instructor) (Date)

Approved by: _____ Spring, 2010
(Dean) (Date)

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I. Course Description

Presents topics in approaches to problem solving, sets, logic, numeration and mathematical systems, geometric systems and elementary computer concepts. Prerequisites: satisfactory score on an appropriate proficiency examination (or) check catalogue, and MTH 3, MTH 4, and MTH 6 or equivalent. Equivalent high school courses are Algebra I, Algebra II and Geometry. Lecture 10 hours per week. (3 credits)

II. Introduction

This course is intended for transfer students in majors other than sciences, business, engineering, and other mathematics related areas. It fulfills the requirements for two-year students in Computer Information Systems.

This is a survey course. The emphasis will be on four major topics--approaches to problem solving, sets, logic, mathematical systems, and geometric systems. Also included in this course is an assignment on logic gates in computers.

III. Specific Objectives

1. Use strategies for problem solving.
2. Explore properties of prime and composite numbers.
3. Find natural number factors.
4. Use divisibility tests.
5. Find prime factorization.
6. Explore perfect and amicable numbers.
7. Determine whether numbers are abundant or deficient.
8. Write even numbers as the sum of two primes.
9. Find twin primes.
10. Describe sets, list elements and use set-builder notation.
11. Identify finite and infinite sets.
12. Find $n(A)$ for each set.
13. Use set symbols.
14. Determine whether two sets are equal, equivalent, both, or neither.
15. Identify subsets and proper subsets.

16. Find the number of subsets and proper subsets.
17. List the subsets of a set.
18. Find complements of sets.
19. Find intersections, unions, and complements of given sets.
20. Describe sets in words.
21. Find Cartesian products.
22. Use Venn diagrams to find intersections, unions, and complements.
23. Write descriptions of Venn diagrams.
24. Give cardinality of unions, intersections, and Venn diagram regions.
25. Solve survey problems.
26. Explore transformation geometry.
27. Explore non-Euclidean geometry, topology, and networks.
28. Explore chaos and fractal geometry.
29. Identify statements.
30. Write negations of statements containing quantifiers.
31. Use Euler diagrams to determine whether an argument is valid or invalid.
32. Identify compound statements.
33. Convert between statements and symbols.
34. Find truth values of compound statements.
35. Construct truth tables.
36. Use conjunction, disjunction, and exclusive disjunction.
37. Use De Morgan's Laws to negate compound statements.
38. Tell whether conditionals are true or false.
39. Write converse, inverse, or contrapositive.
40. Write "if then" statements.
41. Tell whether biconditionals are true or false.
42. Negate conditional statements.
43. Rewrite a conditional as a disjunction.
44. Use truth tables to decide whether a pair of statements is equivalent.
45. Use a truth table to decide whether an argument is valid or invalid.
46. Use computer logic to add binary numbers.
47. Convert Egyptian numerals to Hindu-Arabic form and vice versa.
48. Convert Chinese numerals to Hindu-Arabic form and vice versa.
49. Use the Egyptian algorithm to find products.
50. Write numbers in expanded form.
51. Simplify numbers in expanded form.
52. Add and subtract in expanded form.
53. Identify numbers represented on abaci.
54. Use the lattice method, Napier's rods, and the Russian peasant method to find products.
55. Use the nines complement method to perform subtractions.
56. Practice basics of different numeric bases.
57. Convert between decimal form and other bases.
58. Convert between non-decimal bases.

IV. Instructional Procedures

The primary instructional techniques will be lecture and problem solving. Emphasis will be placed on discussing assigned homework in class. Students will be encouraged to ask questions and respond to questions asked by either the instructor or another student.

V. Instructional Materials

A. Student Materials

1. Textbook: Mathematical Ideas, 11th Edition
Authors: Miller, Heeren, and Hornsby
Publisher: Addison-Wesley Longman, 2001
Date: 2001. ISBN: 0-321-36148-2
2. MathXL Access Code, bundled with textbook or purchased separately.
ISBN: 0-201-72611-4
3. A calculator with algebraic logic. TI 36X preferred.

B. Instructor Materials

1. The instructor will use chalkboard, transparencies, and films (as available).
2. The instructor will prepare handouts to supplement material in the book when appropriate.

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

VI. Course Content

Chapter 1 - Approach to Problem Solving
Chapter 5 - Sections 1 & 2 - Number Theory
Chapter 2 - Sets
Chapter 9 - Sections 6, 7, 8 - Geometry
Chapter 3 - Logic
Assignment - Logic Gates
Chapter 4 - Numeration and Mathematical Systems

VII. Evaluation

Your course grade will be based on the following:

Homework	10%
Quizzes	10%
Chapter Tests:	60%
Final Exam	20%

Letter grades will be assigned based on your final percentage as follows:

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

Homework – Each section has a MathXL assignment, a book assignment, or both. Homework submitted more than one week late receives no credit.

Quizzes – There are ten (10) quizzes throughout the semester. They are either administered through MathXL or distributed in class to be completed outside of class. Either way, the quiz problems are similar to those encountered in homework.

Tests – There are four (4) tests. There are no make-up tests. If a student misses a test, the grade for that test is “0”.

Final Exam – There is a comprehensive final exam. The final exam grade also replaces the lowest test grade if doing so is to the student’s advantage. Everyone takes the final exam.

VIII. E-mail Policy

If you send me an e-mail, you should include a **descriptive** subject line. Please remember to use complete sentences and follow the rules of grammar. Do not expect a prompt reply to your e-mails concerning last minute questions about an exam the next day.

IX. 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” 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 by the last day to drop class and receive refund must be deleted by the instructor during the following week. No refund will be applicable.

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

When an instructor determines that absences constitute unsatisfactory attendance, a Faculty 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" except under 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.

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

*During a summer semester, a maximum of 4 absences are allowed.

X. Student Help

Help is available to students in several forms including:

- a. A videotape series on CD-ROM is provided with the text for student convenience.
- b. Math Tutor Center (<http://www.awl.com/tutorcenter>)
Live one-on-one tutoring is available to students who purchase the text. A Tutor Center registration number is bundled with the text. Students can contact the Tutor Center via toll-free phone, fax, e-mail, or Internet.
- c. A web site for this text (<http://www.awl.com/mhh>) provides additional resources for students.
- d. I am available for help by phone, e-mail, voice mail, or during office hours.
- e. Other students taking the course are often a good source of help.
- f. The "Academic Assistance" in Martin Hall has both student and professional tutors.

X. Disability

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 for assistance.

Please feel free to talk to me privately concerning your accommodations and we will work together with the Disability Services Office staff, Jeananne Dixon and Phyllis Holliman (Rooker Hall, Counseling Center).