



14. Analyze properties of prime and composite numbers.
15. Find natural number factors.
16. Use divisibility tests.
17. Find prime factorization.
18. Distinguish perfect and amicable numbers.
19. Determine whether numbers are abundant or deficient.
20. Write even numbers as the sum of two primes.
21. Find twin primes.
22. Describe the Fibonacci sequence and the golden ratio.
23. Use the Fibonacci sequence to predict the next equation in a list.
24. Describe sets, list elements and use set-builder notation.
25. Identify finite and infinite sets.
26. Find  $n(A)$  for each set.
27. Use set symbols.
28. Determine whether two sets are equal, equivalent, both, or neither.
29. Identify subsets and proper subsets.
30. Find the number of subsets and proper subsets.
31. List the subsets of a set.
32. Find complements of sets.
33. Find intersections, unions, and complements of given sets.
34. Describe sets in words.
35. Find Cartesian products.
36. Use Venn diagrams to find intersections, unions, and complements.
37. Write descriptions of Venn diagrams.
38. Give cardinality of unions, intersections, and Venn diagram regions.
39. Solve survey problems.
40. Analyze transformation geometry.
41. Analyze non-Euclidean geometry, topology, and networks.
42. Analyze chaos and fractal geometry.
43. Identify statements.
44. Write negations of statements containing quantifiers.
45. Use Euler diagrams to determine whether an argument is valid or invalid.
46. Identify compound statements.
47. Convert between statements and symbols.
48. Find truth values of compound statements.
49. Construct truth tables.
50. Use conjunction, disjunction, and exclusive disjunction.
51. Use De Morgan's Laws to negate compound statements.
52. Tell whether conditionals are true or false.
53. Write converse, inverse, or contrapositive.
54. Write "if ..., then ..." statements.
55. Tell whether biconditionals are true or false.
56. Negate conditional statements.
57. Rewrite a conditional as a disjunction.
58. Use truth tables to decide whether a pair of statements is equivalent.
59. Use a truth table to decide whether an argument is valid or invalid.
60. Use computer logic to add binary numbers.
61. Convert historic numerations to Hindu-Arabic form and vice versa.
62. Perform arithmetic operations within historic numeration systems.
63. Use the Egyptian algorithm to find products.
64. Write numbers in expanded form.

65. Simplify numbers in expanded form.
66. Add and subtract in expanded form.
67. Identify numbers represented on abaci.
68. Use the lattice method, Napier=s rods, and the Russian peasant method to find products.
69. Use the nines complement method to perform subtractions.
70. Practice basics of different numeric bases.
71. Convert between decimal form and other bases.
72. Convert between non-decimal bases.
73. Perform clock arithmetic.
74. Perform modular arithmetic.
75. Solve problems using modular arithmetic.

#### **IV. Instructional Methods**

The instructional procedures will include lectures, discussions, problem sessions, in class work, homework, reviews and tests.

#### **V. Instructional Materials**

Textbook: Mathematical Ideas, 13<sup>th</sup> Edition  
Miller, Heeren, and Hornsby

Software: MyMathLab

Calculator: A calculator with algebraic logic. TI 30XIIS preferred.

#### **VI. Course Content**

- Problem Solving
- Number Theory
- Set Theory
- Geometry
- Logic
- Numeration and Mathematical Systems

#### **VII. Evaluation**

The grade for the course will be calculated from Tests, MyMathLab assignments, a final exam and other work as deemed appropriate by the instructor. See individual syllabus for details on percentages/points.

#### **VIII. Attendance**

Regular attendance at classes is required. When absence from a class becomes necessary, it is the responsibility of the student to inform the instructor prior to the absence whenever possible. The student is responsible for the subsequent completion of all study missed during an absence. Any instruction missed and not subsequently completed will necessarily affect the grade of the student regardless of the reason for the absence.

## **X. Withdrawal Policy**

### **Student Initiated Withdrawal Policy**

A student may drop or withdraw from a class without academic penalty during the first 60 percent 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 60 percent of a session, a student who withdraws from a class 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 reviewed and a decision made by the Director of Student Services.

### **No-Show Policy**

A student must either attend face-to-face courses or demonstrate participation in distance learning courses by the last date to drop for a refund. A student who does not meet this deadline will be reported to the Admissions and Records Office and will be withdrawn as a no-show student. No refund will be applicable, and the student will not be allowed to attend/participate in the class or submit assignments. Failure to attend or participate in a course will adversely impact a student’s financial aid award.

### **Instructor Initiated Withdrawal**

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 (face-to-face classes) or performance/participation (DE classes) in each class throughout the semester.

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.

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

In accordance with the No-Show Policy, a student who has not attended class or requested/accessed distance learning materials by the last day to drop the class and receive a refund must be withdrawn by the instructor during the following week. No refund will be applicable.

When an instructor withdraws a student for unsatisfactory attendance (face-to-face class) or non-performance (DE class), the last date of attendance/participation will be documented. Withdrawal must be completed within five days of a student's meeting the withdrawal criteria. A grade of "W" will be recorded during the first sixty percent (60%) period of a course. A student 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 of reinstatement into the class may be approved only by the instructor.

## **XI. Disability and Diversity Statements**

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

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.

**XII. Evacuation Procedure**

Evacuation Procedure: Please note the evacuation route posted at the classroom doorway. Two routes are marked in case one route might be blocked.