

**NEW RIVER COMMUNITY COLLEGE
DUBLIN, VIRGINIA**

COURSE PLAN

Course Number and Title: MTH 286 Discrete Mathematics

Prepared by: Mathematics Department Spring, 2015
(Date)

Approved by: _____ Spring, 2015
(Dean) (Date)

I. Course Description

Presents topics in discrete mathematical structures which are basic tools used in computer science. Covers sets, Boolean algebra, counting methods, generating functions and recurrence relations, graph theory, trees, and an introduction to finite state automata.

Prerequisite: MTH 174 or equivalent. (Equivalent for MTH 174 is the combination of MTH 175, 176, 177 and 178)

II. Introduction

The course satisfies a mathematics requirement for the for mathematical, physical, and engineering science programs. Discrete mathematics describes processes that consist of a sequence of individual steps. This contrasts with calculus, which describes processes that change in a continuous fashion.

III. Student Learning Outcomes

Upon completion of this course, the student should be able to:

1. Solve problems involving the concepts of sets, including universe set, null set, subset, union, intersection, complement, differences, Cartesian product and the power set.
2. Understand the logical process, methods of proof and Boolean algebra.
3. Solve problems using the basic principles of counting theory, including permutation, combinations, and the pigeonhole principle.
4. Solve problems involving functions and relations, including operations and properties of functions and using recursive relations to solve problems and develop algorithms.
5. Recognize graphs, represent them as a matrix, solve graph problems and understand related graph algorithms.

6. Understand trees, including spanning trees and tree traversal algorithms.
7. Evaluate sequences.
8. Define sequences recursively.
9. Solve proofs by mathematical induction.

IV. Instructional Methods

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

V. Instructional Materials

Textbook: Susanna S. Epp, Discrete Mathematics with Applications, 4th Ed.,
Brooks/Cole,
ISBN: 978-0-495-39132-6

Calculator: See instructor specific requirements.

Other: Pencils and paper. Ink is not to be used for any graded work

VI. Course Content

- Logic of compound statements
- Logic of quantified statements
- Elementary number theory and methods of proof
- Sequences, mathematical induction, and recursion
- Set theory: properties of sets, disproofs, algebraic proofs, Boolean algebras
- Functions defined on general sets
- Relations on sets, reflexivity, symmetry, transitivity, and partial order relations
- Graph theory: definitions, trails, paths, trees, trees

VII. Evaluation

The grade for the course will be calculated from tests, homework, 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.

IX. Cheating Policy

The giving or receiving of any help from another student or unauthorized individual on any graded portion of the course is considered cheating and will not be tolerated. The use of books, notes, electronic devices or any other unauthorized material during tests is considered cheating, and will not be tolerated. Any student found cheating will receive a grade of “0” on that assignment and may receive an “F” for the course. This “0” cannot be replaced by any other score. Mobile phones are not permitted to be used as calculators.

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.

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