

Naugatuck Valley Community College
STEM Division
Science, Technology, Engineering and Mathematics

Common Course Syllabus
Math for the Liberal Arts MAT*H146

COURSE TITLE: *Math for the Liberal Arts*, MAT* H146

COURSE DESCRIPTION: This is a survey course designed to acquaint the liberal arts student with a broad spectrum of mathematical ideas not emphasized in traditional algebra courses. As a terminal mathematics course, it conveys the nature and diversity of mathematics, its methods, applications, and roles in society. Topics are selected from problem solving and critical thinking skills, graph theory, voting and apportionment, introduction to probability, linear programming, patterns and symmetry, linear and exponential applications; others may include fractal geometry, financial management, fair division schemes, game theory, or codes.

NUMBER OF CREDITS: 3 credit hours

PREREQUISITE: Grade of “C” or better in MAT* H137 (Intermediate Algebra) or an appropriate score on a college placement exam.

CALCULATOR: A TI-84 (Plus) or TI-83 (Plus) graphing calculator is strongly recommended.

RATIONALE: This course is intended for the student whose major field of study requires no specific mathematical preparation; it meets the mathematics requirement for liberal arts and/or general studies (non-science) transfer students and gives these students an alternative to College Algebra (MAT* H172). Designed to dispel the common opinions that mathematics is only arithmetic and algebra, and that mathematics is not useful in today’s society, it provides the opportunity to view mathematics as a living, changing, developing subject while providing students with an introduction to a broad range of topics in mathematics.

COURSE OBJECTIVES:

1. Develop an appreciation for mathematics as an art as well as a science.
2. Demonstrate an understanding of the interrelationship of mathematics and various other fields of knowledge.
3. Develop quantitative capabilities and gain experience in the application of mathematical techniques relevant in today’s world.
4. Develop a capacity to engage in logical thinking and apply various problem-solving approaches to investigate and understand mathematical concepts.

LEARNING OUTCOMES: At the end of this course the student will be able to demonstrate outcomes from a minimum of 4 of the following 7 areas. Additional outcomes are dependent upon additional topics selected.

1. Problem Solving and Critical Thinking Skills: Develop deductive and inductive reasoning skills, estimation skills, and problem-solving techniques.
2. Graph Theory: Discuss principles of graph theory and networks to solve routing problems.

3. Voting and Apportionment: Analyze such voting methods as plurality, Borda count, and pairwise comparison.
4. Introduction to Probability: Compute probabilities where outcomes are equally likely; calculate odds and expectations.
5. Linear Programming: Graph a system of linear inequalities in two variables to model a situation involving linear constraints; use linear programming concepts to solve optimization problems.
6. Patterns and Symmetry: Discuss basic rigid motions in a plane (reflection, rotation, translation); develop an understanding of tessellations (tilings).
7. Linear and Exponential Applications: Recognize arithmetic and geometric patterns in the world as they relate to linear and exponential growth, respectively.

COURSE OUTLINE / INSTRUCTIONAL UNITS:

- A. Problem Solving and Critical Thinking Skills
 - Solving Strategies
 - Deductive Reasoning
 - Inductive Reasoning
 - Estimation
- B. Graph Theory
 - Euler Circuits
 - Hamiltonian Circuits
 - Trees
- C. Voting and Apportionment
 - Voting Methods
 - Voting Dilemmas
 - Apportionment Methods
 - Apportionment Paradoxes
- D. Introduction to Probability
 - Basic Concepts
 - Theoretical Probability
 - Expected Values
- E. Linear Programming
 - Solving Systems of Linear Inequalities
 - Determining Objective Function, Constraints, Feasible Region
 - Evaluating Objective Function and Determining Solution
- F. Patterns and Symmetry
 - Translations
 - Reflections
 - Rotations
 - Tilings
 - Symmetry of Scale and Fractals
- G. Linear and Exponential Applications
 - Linear Growth
 - Exponential Growth
 - Logistic Growth

GRADING SYSTEM: For the purpose of computing numerical credit point averages, grades are evaluated as follows for each semester hour of credit. Grades on exams, papers, and quizzes, will be based on this grading system.

Numeric Grade	Acceptable Letter Grade Range to be used by the instructor	Description
90 – 100	A– to A	Excellent
80 – 89	B–, B, B+	Above Average
70 – 79	C–, C, C+	Average
60 – 69	D–, D, D+	Below Average
Below 60	F	Failing

CLASS

CANCELLATION PROCEDURE: *If the instructor is late, the class is expected to wait 15 minutes before leaving or until informed of a cancellation by a college official. Information on weather related closings/late openings concerning Naugatuck Valley Community College can be obtained through local radio and television stations, or via the college website (<http://www.nvcc.commnet.edu>). NOTE: An alternative assignment may be given if classes are canceled due to weather.*

ACADEMIC HONESTY STATEMENT: *At NVCC we expect the highest standards of academic honesty. Academic dishonesty is prohibited in accordance with the Board of Trustee's Proscribed Conduct Policy in Section 5.2.1 of the BOT Policy Manual. This policy prohibits cheating on examinations, unauthorized collaboration on assignments, unauthorized access to examinations or course materials, plagiarism, and other proscribed activities. Plagiarism is defined as the use of another's idea(s) or phrase(s) and representing that/those idea(s) as your own, either intentionally or unintentionally. Anyone who is caught cheating on exams, plagiarizing another's work or published material will fail the course regardless of progress made in the course.*

CHILDREN ON CAMPUS: *With permission of the instructor only – Children must be attended at all times by a responsible adult. The student must notify the instructor or supervisor prior to the beginning of the class or activity that a child is present. Instructors and/or supervisors are authorized to ask the student or program participants to leave should the presence of a child be disruptive.*

CELL PHONE/PAGER USE POLICY: *Students are hereby notified that cellular phones and beepers are allowed in class only if they are turned off or turned to a silent mode. Under no circumstances are telephones to be answered in class. Students who ignore this policy may be asked to leave class. When there are extenuating circumstances that require that a student be available by phone or beeper, the student should speak to the instructor prior to class, so that together they can arrive at an agreement concerning the device.*

STUDENTS WITH SPECIAL NEEDS: *Students who may require accommodations on the basis of a learning disability are encouraged to contact the Coordinator of Learning Disabilities. Students who may require accommodations on the basis of all other disabilities should contact the Coordinator of Disability Services. After providing documentation and completing the disability disclosure process, students are then encouraged to meet with their instructor(s) to discuss the accommodations approved by the appropriate Coordinator and to complete the Accommodations Agreement form. Accommodations are not retroactive, students are therefore encouraged to meet with their instructor(s) at the beginning of each semester. Instructors, in conjunction with appropriate college personnel, will provide assistance and/or accommodations only to those students who have completed the disability disclosure and accommodations process.*