

Salisbury University Department of Mathematical Sciences

MATH 105: Liberal Arts Mathematics: Counting and Graphs
Syllabus (Tentative)

Description: Study of the beauty and structure of mathematics, with emphasis on quantitative and analytical reasoning skills. Various areas of mathematics or its applications will be used as a vehicle for this study. Designed for students whose major area of study does not have specific requirements in mathematics. 4 Hours Credit: Meets 4 hours per week. Meets General Education IVB or IVC or Quantitative Analysis.

Prerequisites: Three years of high school mathematics including geometry or college-level intermediate algebra.

Intended Audience: Liberal arts majors who need a mathematics course to satisfy a General Education requirement.

Objective: Introduce students to common methods in combinatorics, probability, and graph theory, with a focus on careful problem-solving and verbal reasoning.

Textbooks: *Applied Finite Mathematics* by Sekhon and Bloom, LibreTexts Mathematics

Topic	Weeks
Counting Principles	4
Methods of counting distinguishable and indistinguishable objects with and without repetition, combinations and permutations, binomial theorem, powers of trinomials and multinomials	
Recurrence relations	1.5
Counting with recurrence relations, Stirling numbers of the second kind	
Probability	3
Relation to counting, conditional probability, probability trees, expected values	
Graph Theory	4.5
Directed and undirected graphs, trees, walks, adjacency matrices and matrix multiplication, Markov chains, and graph algorithms	
Exams	1
Total	14

Evaluation

Homework & Classwork	20-30%
Projects	15-20%
Exams	30-40%
Final Exam	20%

- Clear descriptions of thought processes, evidence of critical thinking, and effective communication must be demonstrated in written work.
- **Writing Across the Curriculum:** Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors' office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**
- **NOTE:** Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.