THE OHIO STATE UNIVERSITY

Mathematics 1116
Excursions in Mathematics
Autumn, Spring
3 credits

Catalog Description:
Critical thinking and problem solving, with relevant topics met in everyday life. Appropriate for non-science majors.

Prerequisite:
Math Placement Level R or higher; or credit for 1075, 75, 104, 1073 or 1074;
or ACT math score ≥ 22 or SAT math score ≥ 520 (scores must be less than 2 years old).

Exclusions:
Not open to students with credit for Math 1152 or higher, or for quarter math class numbered 153 or higher.

Purpose of Course:
The emphasis in this course is on intuitive understanding and developing some facility for applying mathematical ideas to problem solving.

Follow-up Courses:
None. Math 1116 is a terminal course.

Text:
Excursions in Modern Mathematics, 8th edition, by Tannenbaum, Pearson,
ISBN 9780321825735

Topics List:

1. Graph theory: graphs, Euler and Hamilton circuits, algorithms for Traveling Salesman Problem, spanning trees, etc.
2. Voting & apportionment: preference ballots; apportionment paradoxes; Congressional apportionment; methods of Jefferson, Adams, and Webster.
3. Patterns & growth: Fibonacci and recursive sequences, golden ratio, population growth models: linear, exponential, and logistic.
4. Symmetry: Rigid motions, rosettes, friezes, rudiments of group theory.
5. Counting & probability: counting principles, permutations and combinations, multiplication rule, randomness, probability.
6. Fractals: recursive definitions, standard examples (Koch snowflake, Sierpinski gasket etc.), self-similarity, fractional dimension.
7. Linear programming: mixture problems, examples in low dimension, corner point principle, algorithms.