Mathematics 130

The Nature of Mathematics (3)

(Effective Fall 2018)

Prerequisite: May not be used to satisfy degree requirements for the B.S. degree. May not be taken for credit by any student who has successfully completed a higher-numbered mathematics course. Prereq: One unit of high school geometry, two units of high school algebra, and a satisfactory score on the placement test.

Catalog Description: Selected topics from algebra, geometry, number theory, logic, probability, statistics, management science, finance, computing and numerical techniques. Modeling and problem solving techniques will be illustrated.

Goal: To provide insight into what mathematics is, what mathematics attempts to accomplish, and how mathematics is used to solve real life problems.

General Education: The faculty of UT Martin have included this as a general education course with the following course goal and student learning outcomes.

Curriculum Goals: The purpose of the Mathematics requirement is to teach students to organize, evaluate and solve problems using both abstract and quantitative approaches. Courses in this area will enable students to communicate using the language of mathematics.

Student Learning Outcomes:

a. Students will use appropriate notation and vocabulary to communicate mathematics.
b. Students will use symbolic and numerical methods to perform calculations.
c. Students will solve problems with real-world applications.

Teaching Objectives: The student will:

1. Analyze the validity of arguments using Venn diagrams, symbolic logic, and truth tables.
2. Understand how to state the converse, inverse, and contrapositive of a conditional, and know which are equivalent to the conditional.
3. Understand the difference between inductive and deductive reasoning.
4. Understand the language of basic set theory including union, intersection, complement, and subset.
5. Understand counting techniques including Venn diagrams, permutations and combinations.
6. Apply basic counting techniques to an analysis of various voting systems.
7. Apply probability concepts to applications such as calculating the risks of inherited diseases and determining the expected value of a lottery ticket.
8. Understand basic finance including being able to calculate interest, calculate the value of an annuity, and amortize a loan.
9. Understand the basic concepts of geometry, including perimeter, area, volume,and surface area.
10. Understand the difference between Euclidean and non-Euclidean geometry and understand the place of geometry in Western civilization.

Text(s): Mathematics–A Practical Odyssey (with WebAssign access code), eighth edition (UTM Version), Johnson and Mowry, PWS Publishing, 2013. ISBN: 9781305767973.

Outline:

Chapter	Title (Sections)	Days
1	Logic (1–5)	6
2	Sets and Counting (1–4)	5
3	Probability (1–5)	6
4	Statistics (1–4)	6
5	Finance (1–4)	5
6	Voting and Apportionment (1)	1
8	Geometry(1–4,8)	6
	One period tests	5
	Total days	40

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