Tennessee Technological University
Mathematics Department

MATH 4620 (MATH 5620) History of Mathematics II

I.   **COURSE DESCRIPTION FROM CATALOG:**
     History of mathematics from the beginnings of calculus through the modern times. Lec. 3. Cr. 3.

II. **PREREQUISITE(S):**
     C or better in Math 3400 (or consent of instructor for MATH 5620).

III. **COURSE OBJECTIVES:**
     To show the development of mathematics over the ages.

IV. **STUDENT LEARNING OUTCOMES:**
     Upon successful completion of the course the student will understand how western cultures from different eras interacted with and influenced each other, including a general sense of their timeframe and mathematical contributions; discuss the development of analytic geometry and probability; compare the approaches taken by Newton and Leibniz in the development of calculus; demonstrate the more sophisticated methods and conceptual foundations that 18th- and 19th-century mathematicians contributed to the rudimentary theories of calculus and probability; demonstrate techniques pioneered by Euler and Gauss in the formalization of number theory; discuss some of the unsolved problems and unanswered questions that motivated the development of statistics, graph theory, and topology, as well as new directions in non-Euclidean geometry, abstract algebra, and set theory that continue to the present.

V.   **TOPICS TO BE COVERED:**
     1. Analytic Geometry: Descartes
     2. The Invention of Projective Geometry
     3. Calculus: Newton and Leibniz
     4. Development of Algebra
     5. Development of Analysis; - definition of the limit, complex analysis, etc.
     6. Probability theory
     7. Number theory: Fermat, Euler, Gauss
     8. Non-Euclidean geometry
     9. Set theory and topology
     10. Other Topics

VI. **ADDITIONAL INFORMATION:**
     Graduate credit is earned on the basis of additional work required by the instructor. Graduate students are usually required to write an essay about a specific mathematician or a theory and include at least four references other than

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VII.   POSSIBLE TEXTS AND REFERENCES:
Howard Eves, *An Introduction to the History of Mathematics,* Saunders 1990
Jeff Suzuki, *A History of Mathematics*, Prentice Hall 2002
Ronald Calinger, *A Contextual History of Mathematics,* Prentice Hall (1999)
Carl B. Boyer, *A History of Mathematics,* 2nd ed., 1991
Carl B. Boyer, *A History of Mathematics*, Princeton University Press, New Jersey, 1985
David M. Burton, *The History of Mathematics: An Introduction*, 4th ed. McGraw-Hill, 1999.

VIII.   STUDENT ACADEMIC MISCONDUCT POLICY:
Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, Student Academic Misconduct at Policy Central.