I. Course Title: Liberal Arts Mathematics

II. Course Prefix/Number: MATH 150

III. Credit Hours: 3

IV. Prerequisite(s):
MATH 099 minimum grade: S
OR Math Placement Test minimum score: 23
OR ACT Math minimum score: 19
OR SAT Math minimum score: 440
OR Accuplacer Elementary Algebra minimum score: 85

V. Catalog Description:
A quantitative and qualitative exploration of some of the great ideas and methods of mathematics. Topics covered include problem solving, infinity, logic, probability, statistics, Fibonacci numbers, the golden ratio, topology, non-Euclidean geometry, Pascal’s triangle, tiling, fractals, chaos, and higher dimensions.

VI. Curricular Relationships:
This course is intended as a terminal course in mathematics for students in non-science majors. It is of interest to students who wish to develop their problem solving abilities and critical thinking skills by learning how to think in a more methodical and structured way.

VII. Student Learning Outcomes:
- Students will be able to describe, interpret, and examine advanced mathematical ideas in an intuitive way.
- Students will demonstrate an ability to see mathematics in the world around them.
- Students will be able to demonstrate problem solving strategies appropriate for a college level mathematics student.
- Students will be able to articulate connections among mathematics, philosophy, and the real world.

VIII. Content Outline:
- Problem Solving: Polya’s four step problem solving method, common pitfalls such as introduction of unnecessary constraints or failure to use known information.
- Logic: Paradoxes, Gödel’s Incompleteness Theorem, and infinity.
- Complexity through Simplicity: Fibonacci numbers, the golden ratio, Pascal’s triangle, fractals, chaos.
- Geometry: Non-Euclidean geometry, tiling, topology, and higher dimensions.
- Probability: Law of large numbers; probabilistic versus deterministic systems; expected value; common mistakes, fallacies, and misunderstandings.
- Statistics: Measures of central tendency, distributions, risk analysis.
IX. Course Procedures/Policies/Grading Scale:
- Students may be required to keep a journal which will be graded at least every other week. Journal entries should reflect an attempt by the student to relate material learned in class to their everyday experiences.
- Homework assignments will largely be of an exploratory/discovery nature. Where appropriate, assignments should conform to Polya’s four step method.
- Two to four examinations will be given during the semester, each of which should contain at least one essay/reflection question.
- Students will discover mathematics on their own through collaborative and active learning exercises. As such, attendance/participation should factor into the final grade.
- Students will work in groups to learn about a mathematical topic of their choosing and present it to the class in a creative way. A formal paper will accompany the presentation.
- A comprehensive final examination is given during finals week.

X. Required/Recommended Readings:
A mathematics textbook addressing the course material in a relevant manner such as:


XI. Issues Unique to Course:
This course is distinguished from many other mathematics courses by the writing component. Students should develop and be able to demonstrate their ability to communicate complicated ideas clearly. In addition, writing assignments should be graded with attention to grammar and spelling.

XII. Additional Departmental Issues: None