Calculated Fiction—*Annotated*

Faculty: Brian L. Walter (mathematics, computer science), Steven Hendricks (creative writing)[1]
Major areas of study include mathematics, literature, fiction writing, literary theory and computer science.
Class Standing: This Core program is designed for freshmen.
Prerequisites: Strong algebra, reading and writing skills are recommended.[2]

"O Godiva, I could be bounded in a nympholepsy and count myself a kingfish of infinite spacemen." —Hamlet[3]

Mathematical principles can provide the basis for creative writing, from the chance operations that generated the quote above to plot structures, themes, content, and even style[4]. Author Italo Calvino[5] views writing as a combinatorial game, an all but random process of associations and layers of implications that can lead to great works of literature as surely as nonsense. Calvino and others reveal that writing guided by abstract principles, particularly mathematical concepts and constraints[6], can lead to some of the most wondrous, original, and provocative work. Jorge Luis Borges's[7] stories provide numerous examples. In "The Aleph," the narrator attempts to describe a location from which all places can be seen simultaneously: "Mystics, faced with the same problem, fall back on symbols: to signify the godhead, one Persian speaks of a bird that somehow is all birds; Alanus De Insulis, of a sphere whose center is everywhere and circumference is nowhere; Ezekiel, of a four-faced angel, who at one and the same time moves east and west, north and south." Works like "The Aleph" not only reflect mathematical concepts but also give them flesh, rendering those abstractions poetic and tangible.[8]

Notes

1 Brian completed his BS in Symbolic Systems at Stanford in 1995 and his PhD in Mathematics at UCLA in 2002. Steven completed his BA at Evergreen in 1997 and his MFA in Writing at The School of the Art Institute of Chicago in 2000.

2 Strong algebra skills means that you were successful in algebra or higher level math in high school and feel you have skills and knowledge that you can recall and use without much difficulty. Strong reading and writing skills means that you have a degree of facility with grammar and essay composition and can invest in the careful study of literature.

3 This short text is a transformation of a line from Hamlet's soliloquy created using a simple technique devised by the Oulipo: replace each noun in the text with the seventh noun following it in a given dictionary. In short: N + 7.

4 Plot, theme, content, and style are not the only ways of integrating mathematics and literature. In fact, we think you'll find the integration far more nuanced than a simple correlation between a literary term and a mathematical idea. In any case, consider these literary terms with some tentativeness, but note that we are looking for a rich conceptual connection between actual mathematics and the art of language. You may find, if you type "mathematical fiction" into Google, a wealth of lists and book reviews. Most of these works fall into the category of works of fiction about a mathematician or where a mathematical idea or bit of math history is part of the subject of the piece. While we will encounter some of these, we are chiefly interested in cases where mathematical ideas play a role at other, deeper levels of literary works.

5 Calvino will be an important figure in our work together. In the first week of class, we will read his essay, "Cybernetics and Ghosts." We will encounter other short works of his in the fall and some of his longer works in the winter.

6 Along with *combinatorial game*, the notion of *constraint* will be a key bridge between what writers do and what mathematicians do. Much of what ties the two together are habits of thought or methods of discovery that seem quite natural to science but in literature are plastered over with romanticism and self-congratulatory humanist sentiment. While we aren't necessarily attempting to create literature that is—in the derogatory sense—mechanical or formulaic, we are willing to see aspects of what we do as related to mechanisms and formulae.

7 Borges will be another key figure in our studies. We will read a book of his short stories, *Ficciones*, in the fall quarter.

8 *Abstraction* will be a key term of our work together. In part, we regard mathematics as the art of abstracting observed reality and then manipulating those abstractions independent of

Informed by the work of writers such as Borges and Calvino, we will construct fictional narratives that reflect or are governed by mathematical concepts. In the fall quarter, students will be introduced to a wide range of mathematical and literary principles and practices. Using those tools, students will produce works rigorous in their literary content and thorough in their mathematical precision and depth. In the winter quarter, the primary focus will be on a major writing project, along with the study of computer programming[9] as a tool to aid further investigation of the potential interplay between mathematics and literature. The regular work of the program will include book seminars, short papers[10], and workshops in literature, writing, mathematics and computer programming, as well as the aforementioned writing project. Readings will introduce students to relevant historical and philosophical ideas, numerous examples of writing that fuse math and literature, and provocative mathematical concepts. Coursework will emphasize foundations and skill development in mathematics,[11] creative writing[12], critical reading[13], argumentative writing[14], literary theory[15], and computer programming[16].

Total: 16 credits each quarter.

Enrollment: 46

Special Expenses: Approximately $75 each quarter for overnight field trips.

Program is preparatory for careers and future studies in mathematics, literature, fiction writing, literary theory and computer science.

observation. A similar process of abstraction is at work in all fiction, even that which seems grounded in the real. All stories are reductions, and all stories obey laws (follow patterns) that have little to do with the laws of reality.

9 Computers offer us some tantalizing prospects. On the one hand, computers can be programmed to generate texts, patterns, or to perform other useful combinatorial exercises; on the other hand, computers offer rich territory for speculating about and perhaps experimenting with questions about language, thought, and meaning. Calvino explores the differences and similarities between the human mind and the computer in "Cybernetics and Ghosts" in order to forward a thesis about the nature of creativity.

10 In fact, you'll be assigned three types of expository writing task: seminar papers, essays, and synthesis essays. Seminar papers will be short, less formal works that you complete as your preparation for and contribution to seminar. Essays are written as careful analyses of a text or texts in relation to program themes. Your two synthesis papers will be assigned on topics that ask you to deal with various program themes and many texts at once.

11 Mathematics workshops, quizzes, homework, readings, final exam.

12 Writing workshops, short creative experiments, project development.

13 Seminar, written work, workshops.

14 Essays, writing workshops.

15 Writing workshops, seminar, essays.

16 (second quarter)