Assignment 2

Great Ideas in Science (BIOL 3018)

Written Assignment Due October 24

Mathematics permeates much of our culture, though sometimes in subtle ways. Groups of 3 or 4 students will be formed to explore how mathematical topics (particularly geometric ideas) are present in our history and culture. Each group will write a 1000 word report and give a 30 minute oral presentation (with PowerPoint slides, images, or brief video clips, if you like). Unlike the first assignment, this one will involve less opinion and more factual or historical data. Don't forget to list references in the written report!

On September 26, six groups will be randomly formed. You will have the opportunity to "ask an expert" (Michel Helfgott of the ETSU Math Department) on October 19. Groups will give their oral presentations on October 24, 26, and 31, with each member of the group contributing.

Possible topics include:

1. Geometry in art: perspective, projective geometry, the art of M. C. Escher, the art of Salvador Dali, renaissance art, comic book art.
2. Math in pseudoscience: misapplications of statistics, misunderstanding of probability (lotteries).
3. Math in sports: statistics, the physics of baseball/golf (why are golf balls dimpled?).
4. Math in the movies or a TV show: "Good Will Hunting," "A Beautiful Mind,' "The Simpsons," "Futurama."
5. Math in history: the "calculus wars" between Newton and Leibniz
6. Special numbers: a history of π, the base of the natural log function e, the golden ratio, rational and irrational numbers, algebraic numbers, transcendental numbers, complex numbers.
7. An area of modern math: topology, modern algebra, analysis, discrete math.
8. Math in architecture: pyramids, bridges, arches.
9. Math in mysticism: numerology, pyramids, lucky numbers.
10. Math in science fiction: hyperspace, improbability drives (*Hitchhiker's Guide to the Galaxy*).
11. Famous mathematicians: Pythagoras, Newton, the non-Euclidean pioneers, Riemann and prime numbers.
12. The geometry of higher dimensions: hyperspace again, how one can move about in a 4-D space, new-age applications of higher dimensions.