

45441 Math D044.27 Mathematics in Art, Culture, and Society: A Liberal Arts Math Class TT, Spring 2019

Instructor: Dr. Karl Schaffer
Class meeting days: Tue/Thu
Class time 4:00-6:15 PM
Classroom: MCC-12
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Office Hrs: **Tue 12:30-1:20 PM, Thu 6:15-7:05 PM**
or by appointment
Class web site: <http://nebula2.deanza.edu/~karl/>

Course content: A survey of selected topics from contemporary mathematics, including problem solving techniques and finding patterns, introduction to combinatorics and the theory of graphs (networks), symmetry and tessellations, scaling and fractals, topology, and number theory. Additional topics are to be selected by the instructor. The course will give students practice in all forms of mathematical communication, with reading assignments, writing assignments, and oral presentations.

Text: The Heart of Mathematics, 3rd Edition, by Burger and Starbird, Pub: Wiley, required. ISBN-13: 9780470424766
ISBN: 0470424761. We will study chapters 1,2, and 4-6.

REQUIREMENT: Students must have a scientific or graphing calculator, which they may use on all exams. All exams will be open book, open notes. **Not allowed:** computers or other communication capable devices may not be used during class time (except for specific assignments as directed by instructor) or on timed exams. Please put them away and DO NOT use cell phones during class.

Grades: 90-100 A, 80-89 B, 70-79 C, 60-69 D, less than 60 F, based on:

25% Three Written/Oral reports – 8.33% each. You will turn in using Turnitin.com.

- (1) **Math autobiography** due one week after first class session, **Tue., April 16**, see page 2 of this sheet for description.
- (2) **Biography** of a contemporary mathematician, written and oral report, due **Tue., May 7**.
- (3) **Report** on an area of mathematics related to the course that sparks your interest, due **Tue., May 21**.

10% One one-hour exam, NO MAKE-UPS! Date of exam: **Tue., April 30**.

10% Exam 2 will be given out on **Tue., May 21** (Take-home), and due in class two weeks later on **Tue., June 4**.
Lowest score of these two exams will automatically be replaced with final exam score, **ONLY** if final is higher.

20% Short class activities, often unannounced. These will usually be group assignments. You may drop your lowest score.

20% Homework assignments. Homework is assigned in each class, and will only be collected at the end of the chapter. Homework is graded for completion, not correctness. **NO LATE HOMEWORK ACCEPTED. EVER!** For full credit, you need only complete 80% of each collected assignments; keep assignments in a loose-leaf binder. Homework grades are either 1 (full credit), $\frac{1}{2}$, or 0.

15% Final Exam: mandatory, comprehensive, scheduled for: **Thu., June 27, 4-6 PM**. No make-ups or early final exams.

For your papers you will use Turnitin.com. I will shortly add everyone to the class list using the roster email address.

Class name: Math 44 Spring 2019

Enrollment password: Math44Now!

Class ID: 20928271

Attendance. Due to the importance of class work and participation, you may miss no more than 3 class sessions during the quarter; if you miss more than three you will be dropped from the class. If you are late by more than 20 minutes or leave early by more than 20 minutes you will be marked absent for 1/2 class. If you are consistently late or consistently leave early, you may also be dropped.

Some background on the instructor: Ph.D. and MA in Mathematics from UC Santa Cruz, undergraduate work at University of Chicago and University of Alabama. Grew up in New England and Alabama. Do research in the mathematics of “networks,” (graph theory) and am very active in math education for K-college. I am also a contemporary dance performer and choreographer, and company I co-direct does shows about math and dance, among other things. For more background on this see mathdance.org, or see our [TEDx talk](#). One of our concerts, *The Daughters of Hypatia: Circles of Mathematical Women*, about the lives of women mathematicians throughout history and their struggles to create groundbreaking mathematics, has begun touring nationally. We will perform another show, *Mosaic*, about peace, justice, culture and conflict in Palestine, Israel, and the Mideast at Montalvo Arts Center in Los Gatos on Friday, Apr. 12, 2019 at 11:30 AM, tickets at http://montalvoarts.org/events/pass1819_mosaic/.

Mathematical “autobiography.” Due at start of third class session.

Turn in on TURNITIN.COM. Write a “mathematical autobiography.” Think about experiences you have had doing mathematics, both in and out of school. Include at least one successful and one not-so-successful episode. You might write about teachers, particular math problems, courses, or real-life applications of mathematics that have affected you and of which you have strong recollections. Include the good, the bad, and the ugly, and be as entertaining as you like. This will give me an opportunity to get to know you a little better; it should also give you an opportunity to reflect on your own experiences with mathematics.

Please also include a statement as to the one math class you took most recently, which class it was, where you took the class, and how successful you feel you were.

Please include a paragraph explaining what are your most important values, and how you think they might be helpful to you in this course.

You must write at least 600 words - that’s about one page SINGLE-SPACED typewritten. You should check the number of words using the “word count” command in most word processors – for example, in Microsoft Word, that command is found in the “Tools” menu. For full credit write a little TOO much! (These will *not* be read to the class! Write about anything you feel comfortable about having the instructor read.)

Many, if not all of us have had particularly negative experiences with mathematics and especially mathematics teaching. Perhaps you can remember a specific incident which seems to have affected your learning and study of mathematics since that time. Or your experiences might have been primarily positive and supportive: success in a difficult class, a teacher who acknowledged your skills at mathematics, an enjoyment in doing mathematics. Write about those experiences that have been most important to you in the greatest detail. Be specific and describe the circumstances and the people involved. Think about the later impact of your experiences - how do they still affect you today?

You might also want to think about how you use mathematical thinking in everyday life - diverse mathematical skills are used in building or designing or in doing craft work, estimating money or amounts, planning complex activities, collecting and organizing data. These activities might not necessitate the use of the quadratic formula, but they probably require good intuitions and understandings about geometric and quantitative knowledge. Write about activities you do which require this kind of mathematical insight.

Report on any cultural influences on your mathematical background. Have you learned ways of doing mathematics that you can identify as being from a culture other than the dominant one in this country? Did you begin learning mathematics in another country, and if so, what changes did you find when you moved here? Can you identify specific cultural influences on how you see your own mathematical knowledge and on your motivation to study mathematics?

Please do not simply list the classes you have taken and the grades received. I am much more interested in whether you were affected by the class, the teacher, and the experience, and in what ways. Describe in detail!

Student Learning Outcome(s):

- *Analyze contemporary mathematical problems, apply problem solving techniques using a variety of methods, and communicate the results mathematically through a variety of forms.
- *Demonstrate and correctly apply basic mathematical techniques in at least five of the following ten areas: symmetry, graph theory, fractals and chaos theory, topology, number theory, geometry, combinatorics, methods of social choice, probability and statistics, economics and personal finance.
- *Examine and evaluate myths and realities about the contemporary discipline of mathematics and its practitioners.