Math 2910: Number "Tricks" in Everyday Life, W 1:30-2:20, in HSCI 330

Professor: Chris Francisco
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Office Phone: (405) 744-8225 (rings my administrative assistant's line)
Office Hours: Mon., 10:30-11:30, Tues., 1:00-2:30, Fri., 11:30-12:30, and by appointment.
Online Classroom (D2L) site: https://online.okstate.edu (then log in and find our course)
Corequisite: Concurrent enrollment in a 2000- or 3000-level MATH course below MATH 3613, membership in the Honors College.
Textbook: None.

This is an honors add-on course that will explore some "tricks" with numbers. By "tricks," I mean ideas that anyone with your math background can learn but that seem mysterious or deceiving at first glance. Each of our units will use as motivation a specific activity you would encounter in everyday life, and we will use that as the starting point for our discussions.

Syllabus Attachment: Please read the OSU syllabus attachment, available on the web at http://academicaffairs.okstate.edu/sites/default/files/Fall%202016%20Syllabus%20Attachment.pdf. This has a lot of important information, including instructions about disability accommodations. Please contact me privately during the first week of the course if you need accommodations as a result of a disability.

Grading: Each week, you will complete some activities in class and a short homework assignment. Some of the assignments may be group activities in which everyone in the group earns the same grade. I will be cognizant of the fact that this is a one-hour course when assigning homework. Your grade will be based on your performance on the in-class activities and the homework. Earning 90% guarantees an A for the semester, 80% a B, 70% a C, and 60% a D. I reserve the right to use discretion if you are on the borderline between two grades, considering class participation, improvement or decline during the semester, attendance, and my subjective judgment of your effort. I do not intend to drop any scores.

Attendance: Attendance is required. It is rare for a student to do well, particularly in a class that meets once a week, if he or she misses class.

Homework: The only way to learn mathematics is to practice it. This is especially true in this course because many of the ideas will be unfamiliar since they do not appear in most standard math classes that you would take. You should start your homework early and expect that you will not be able to solve all the problems without putting in some time and effort. Making mistakes and going down wrong paths while persisting through difficulties is a vital part of the learning process.

Conflicts: I will offer reasonable accommodation in the event that you miss a major assessment activity for a valid and documented reason, assuming documentation is provided **in advance unless absolutely impossible**. If you won't be in class when homework is due, turn it in early or give it to someone else to turn in prior to the deadline. I require proof of the reason for your absence (e.g., a doctor's note, proof of involvement in an OSU-sponsored activity, etc.), and you should not assume you will be eligible for an accommodation unless I have explicitly approved your request.

Academic Honesty: Don't cheat. Don't copy off of other students, allow other students to copy your work, or present work you find in printed or electronic sources as your own. You may get help on homework from other people or sources but should write your solutions independently, without looking at anything someone else has produced. For questions, contact the Office of Academic Affairs, 101

Whitehurst, (405) 744-5627, http://academicintegrity.okstate.edu. I deal with cheating very harshly; don't take any chances.

What if I need help? You have lots of resources for this course. Often students find it helpful to talk to each other and work through homework problems together. You're encouraged to post questions and answers in the Discussion section of the Online Classroom. For **quick** questions, you can send me e-mail if you're really too shy to post there, and you should certainly come see me in person during office hours if you have something more than a quick question. Finally, while there is free tutoring available in the MLSC, and some tutors may be able to help with some of these questions, you might have more luck talking with each other or talking with me since some of this material is not covered in standard OSU math classes. I wouldn't go to the MLSC with the expectation that you'll find help there, but it is a good place to gather with a group and work. **Above all, see me early if you have questions.** Good luck.

Topics covered: This is just a sample of the topics we will cover this semester. I will talk with the class about your interests and let that guide the other units we do.

- **Elementary algebra**: Chocolate math e-mail forward
- **Modular arithmetic**: Credit card processing, check digits in various contexts, such as ISBNs
- **Arithmetic in different bases**: A magic trick to amaze your younger siblings, plus some actually useful applications
- **Probability**: How common is it to share a birthday? What mathematics goes into this?
- **Statistics**: Can we detect fraud by looking at lists of numbers?

First Assignment: Easiest 5 points of the semester, due by 5:00 p.m. on Friday, August 19.

1. Send me an e-mail at chris.francisco@okstate.edu. Write me a **paragraph** (not a list) including your name, year in school, major, hometown, current math class(es), and anything interesting about yourself you want to tell me, especially your interests in and out of school. These e-mails let me know something about my students and help me get to know everyone. If you don't get a reply from me within a day, I probably didn't receive the e-mail; talk to me about it.
2. Go to https://online.okstate.edu to log on to the Online Classroom (Desire2Learn). After logging in, you should see Math 2910 in your list of courses. Look at the course documents in the Content section, and find the Discussion board. You should use the Discussion board to converse with me and with others in the class about homework.
3. Find the syllabus attachment described above, and read it carefully.

Course objectives:

- Learning some basic abstract algebra, number theory, and probability
- Understanding how to apply mathematical knowledge in everyday situations
- Writing clear, coherent mathematical arguments
- Developing skills using computer algebra systems; understanding when it is appropriate to use technology and how best to combine conceptual knowledge with computational methods
- Becoming comfortable with making mistakes as part of persisting through difficulties in unfamiliar problems