

# Paradoxes: Mathematics of Nonsense

TR: 10:15 - 12:20; Winter 2018

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**Instructor:** Dr. Emily Cilli-Turner                      Office: MDS 306C  
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Office Hours: W: 11 - 12 pm; Th: 12:30 - 1:30 pm (in the TLC) and by appointment

**Course Description:** A paradox is a statement which leads to consequences or results which are strikingly counter to intuition or established results. This is a course that explores and analyzes different types of paradoxes and their resolutions. We will study self-referential paradoxes, paradoxes in probability, statistics, graph, and voting theory, as well as visual paradoxes, paradoxes involving infinity, and many others.

## Recommendations for Success:

- Come to class every day, on time, and ready to go.
- Check canvas every day; make sure your Canvas account is linked to your UW email account.
- Watch recommended videos, do readings, and turn in assignments on time.
- Read and follow directions, ask for clarification anytime you don't understand something.
- Participate fully in classroom conversations and activities.
- Be respectful of your peers as well as your instructor.
- Promote a good learning environment by having a good attitude towards learning.

**Student Learning Objectives:** by the end of the course you should be better at

1. interpreting mathematical models and drawing inferences.
2. representing mathematical information symbolically, visually, numerically, and verbally.
3. using arithmetic, algebraic, geometric, and statistical methods to solve problems.
4. estimating and checking answers to math problems in order to determine reasonableness, identify alternatives, and select optimal results.
5. recognizing that mathematical and statistical methods have limits.
6. synthesizing varied resources to develop a coherent understanding of a topic.
7. identifying and understanding logical fallacies, and distinguishing them from good parts of an argument.
8. applying critical thinking skills to everyday life.

## Texts:

Paradoxes in Mathematics by S. Farlow

An Illustrated Book of Bad Arguments by A. Almossawi; both are required.

**Course Calendar:** The Canvas course page will get updated weekly with information about upcoming topics, assignments, tests, and projects, along with course materials and some related YouTube videos that may be helpful. A daily schedule of topics and assignments is available at on the "Syllabus" page of the course website, or via your student Canvas calendar page. The calendar may be updated during the course at my discretion, although all updates will be announced in class. A rough order of the topics we will cover in the course: *You are responsible for keeping up-to-date with the class calendar and due dates for homework, quizzes, projects, and exams.*

**Participation:** Class activities, discussions, and worksheets contribute to this grade. You are expected to attend class regularly: if you miss a class, it is your responsibility to find out and cover what you missed using Canvas, asking classmates, or office hours.

**Homework:** Homework is assigned weekly, and they are due on Mondays after being assigned at the beginning of class. It will consist of problems related to the lectures and class readings. You are encouraged to work with others, but the final work should be written by you in your own words. Please write them up neatly, and show work for full credit. You will be given **one latepass** to use once during the quarter to turn in a homework assignment up to 48 hours late with no penalty. After your latepass has been used, no late assignments will be accepted. If you are going to miss a class, turn homework in early or submit via email before class time.

**Quizzes:** There will be five quizzes during the quarter scheduled for every other Thursday. Quizzes will consist of questions related to in class discussion, readings, and homework and will generally be open note. They will not be cumulative, covering only the new material since the previous quiz. Makeups for missed quizzes are not available, but your **lowest quiz score will be dropped** to account for emergencies and bad days.

**Project & Paper:** There will be a group project and presentation at the end of the quarter on a paradox chosen from an approved list. You will need to find sources, give a presentation in class, lead a discussion on your topic and submit a short paper on your paradox. Groups will consist of about 2 students, with group composition and topic subject to instructor approval. More details will be given on the Canvas page.

**Course Grades:** The following weights will be used to calculate your percentage in the course. Decimal grades are assigned in accordance with the UW Tacoma decimal grading policy found here: <https://www.tacoma.uw.edu/node/37545>.

Participation: 10%  
Homework: 30%  
Quizzes: 30%  
Project: 15%  
Final Paper: 15%

**Office Hours, Contact:** All office hours will be held in the Teaching & Learning Center (the TLC). If you are unable to make my posted office hours, I am happy to try and make appointments - come talk to me. I am also typically available before and after class for questions or to address concerns.

*Email or Canvas are both appropriate ways to get in touch with me: although I will likely respond more rapidly via email.* I can generally be reached between 9am-7pm, and will try to respond within the hour to reasonable questions. If emailing regarding homework questions, please be sure to indicate which homework, and which problem number you are referring to.

**If you are ever feeling overwhelmed, please do not hesitate to let me know. Although many students find mathematics stressful, it does not have to be, and I will do whatever is reasonable to help you succeed.**

**Getting Help:** Do not allow yourself to fall behind! There are many ways to get help if you are struggling with the material. The Teaching and Learning Center (TLC) is a great place to start and offers not only one-on-one tutoring, but also workshops to help you get more practice on concepts. You are allowed and encouraged to work on homework together as much as possible; however, each student is responsible for their own write-up. You can use the discussion board on Canvas to post questions about the material and I or another student will respond. Additionally, you can come to my office hours or make an appointment and ask questions whenever necessary.

## **UWT Policies & Expectations:**

- Academic Calendar – [washington.edu/students/reg/calendar.html](http://washington.edu/students/reg/calendar.html)
- Academic Honesty – [tacoma.uw.edu/node/38211](http://tacoma.uw.edu/node/38211)
- Emergencies, Safety, and Evacuation Routes – [tacoma.uw.edu/node/20236](http://tacoma.uw.edu/node/20236)
- Inclement Weather – always check the UWT Home Page at [tacoma.uw.edu](http://tacoma.uw.edu). Official campus closures or delays will be announced there first. Course Announcements and Email regarding assignments and expectations during a closure will follow once the severity of the situation is known.
- Safe Campus - preventing violence is a shared responsibility in which everyone at the UW plays apart. The SafeCampus website provides information on counseling and safety resources, University policies, and violence reporting requirements help us maintain a safe personal, work and learning environment. [tacoma.uw.edu/safecampus/uwt](http://tacoma.uw.edu/safecampus/uwt)
- UW Tacoma Email Policy – Make sure you use your UW email for all University correspondence! [tacoma.uw.edu/information-technology/uw-tacoma-email-policy](http://tacoma.uw.edu/information-technology/uw-tacoma-email-policy)

**Academic Support:** Numerous campus resources are available to support your academic success. Know your options and seek help and resources when needed.

- Disability Resources for Students – resources and support for students with disabilities [tacoma.uw.edu/dss](http://tacoma.uw.edu/dss)
- Student Success Mentoring Program – Connect with a faculty or staff mentor [tacoma.uw.edu/ssmp](http://tacoma.uw.edu/ssmp)
- Teaching and Learning Center – (TLC) 2nd floor of the Snoqualmie building – Quantitative skills support: peer tutoring available for math, science, statistics and more... [tacoma.uw.edu/tlc](http://tacoma.uw.edu/tlc)
- Technology Support – Labs, software, equipment checkout and help with Canvas, Google, email, logins, etc. [tacoma.uw.edu/it](http://tacoma.uw.edu/it)
- Online Support for Your Course Work – <http://www.tacoma.uw.edu/online-learners/online-support-students>