

**Tmath 102 C: Paradox – Mathematics of Nonsense  
Autumn 2017**

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**Office Hours:** M: 11 am – 12 pm in MDS 303 B (or by appointment)  
**TLC Hours:** T: 12 pm – 1 pm in TLC (2nd floor of Snoqualmie building)

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, probabilistic and statistical paradoxes, visual paradoxes, paradoxes of infinity and infinitesimal, among others.

**Lecture:** MWF: 9:30 – 10:50 am in BHS 103

**Textbook:** Paradoxes in Mathematics by Stanley J Farlow (Required)  
An Illustrated Book of Bad Arguments by Ali Almosawi (Required)

**Course Website:** <http://bit.ly/102a2017>

**Basic Expectations:**

- (a) **Actively** engage in all class discussions, activities, and ask questions that are relevant and move the discussion forward.
- (b) **Be** respectful of others rights to speak.
- (c) **Criticize** arguments, not the person who makes it.

**In order to be successful in this course, you should do the following:**

- Come to class every day, on time, ready to go.
- Check canvas everyday: make sure your canvas account is linked to your UW e-mail account.
- Turn in your assignments on time.
- Follow directions, and ask for clarification if you don't understand something.
- Participate fully in classroom conversations.
- Be respectful of your instructor as well as your peers.
- Promote the learning environment through the kinds of questions you ask and your own attitude towards learning.

**Grading:**

Participation:	10%
Homework:	30% (lowest score dropped)
Quizzes:	20%
Project:	15%
Final:	25%

**Participation:**

Class activities, work sheets, and discussions will be graded daily. You are expected to attend class regularly. If you must miss a class, it is your responsibility to find out what you missed.

**Homework:**

Homework is assigned weekly, and they are due on following Mondays at the beginning of class. It will consist of problems similar to those discussed in lecture. I encourage you to work with others,

but the final work should be written by you in your \*own words\*. Write up neatly, and show work for full credit. No late assignments will be accepted. If you are not able to make it to class, submit your solution via e-mail sometime before class.

**Quizzes:**

There will be four quizzes at 5% each. Problems designed for quizzes will be modification of problems discussed in class or assigned for homework.

**Project:**

There will be group presentation on a paradox on 11th week. The presentation will be worth 15% of your grade.

**Final Exam:**

There will be a final exam on Wednesday, December 13th, 8 – 10:05 am in BHS 103. It will be comprehensive exam, and this will account for 25% of your grade.

**Tentative Schedule:**

Week 1: Liar's paradox, Introductory logic;  
Week 2: Introductory logic (cont), Knights and knaves problems;  
Week 3: Logical fallacies, Introductory set theory;  
Week 4: Monty Hall paradox, Introductory probability theory, Quiz 1;  
Week 5: St Petersburg Paradox, 11 gambling brothers, Number guessing game;  
Week 6: Simpson's paradox, Gerrymandering, Introductory Voting Theory, Quiz 2;  
Week 7: Friendship paradox, Introductory graph theory, (Veterans Day);  
Week 8: Visual paradoxes, Escher's perspective drawings, 3D movies, Quiz 3;  
Week 9: Hilbert's grand hotel, Introduction to infinities, (Thanksgiving);  
Week 10: Zeno's paradox, Infinite series, Stacking cards, Quiz 4;  
Week 11: Project presentations, Review.

**Learning Goals and Objectives:**

1. Interpret mathematical models and draw inferences.
2. Represent mathematical information symbolically, visually, numerically, and verbally.
3. Use arithmetical, algebraic, geometric and statistical methods to solve problem.
4. Be able to estimate and check answers to math problems in order to determine reasonableness, identify alternatives, and select optimal results.
5. Recognize that mathematical and statistical methods have limits.
6. Synthesize varied resources to develop a coherent understanding of a topic.
7. Recognize and understand logical fallacies, and be able to distinguish them from good parts.
8. Apply critical thinking skills to everyday life.

**E-mail Policy:**

Please use your UW email address to contact me.

[http://www.tacoma.washington.edu/policies\\_procedures/E-mail\\_Policy.pdf](http://www.tacoma.washington.edu/policies_procedures/E-mail_Policy.pdf)

**Electronic Devices:**

Electronic devices (including, but not limited to, cell phones, pagers, laptops and personal digital assistants) may only be used in the classroom with the permission of the instructor. Activities that are not relevant to the course, such as checking/ sending email, playing games, and surfing the web, are considered disruptive activities when class is in session.

**Inclement Weather**

Call 253-383-INFO or check the UW Tacoma homepage to determine whether campus operations

have been suspended or delayed. If not, but driving conditions remain problematic, call the professor's office number. This number should provide information on whether a particular class will be held or not, and/or the status of pending assignments. If the first two numbers have been contacted and the student is still unable to determine whether a class(es) will be held, or the student has a part-time instructor who does not have an office phone or contact number, call the program office number for updated information.

### **Disability Resources for Students**

The University of Washington Tacoma is committed to making physical facilities and instructional programs accessible to students with disabilities. Disability Resources for Students (DRS), located in MAT 354, functions as the focal point for coordination of services for students with disabilities. If you have a physical, emotional, or mental disability that "substantially limits one or more major life activities [including walking, seeing, hearing, speaking, breathing, learning and working]," and will require accommodation in this class, please contact DRS at 253.692.4508, email at [drs@uw.edu](mailto:drs@uw.edu) or visit <https://www.tacoma.uw.edu/drs> for more information.

### **Teaching and Learning Center**

The Teaching and Learning Center (TLC) offers free academic support for students at all levels. We offer one-on-one consultations and group workshops in writing, math, statistics, science, and Spanish. We also work with students on questions about English grammar & vocabulary, reading, and learning strategies. We are located in Snoqualmie 260 and online. Our schedules for appointments and drop-in visits are posted on our website at <http://www.tacoma.uw.edu/tlc>. For special needs or subject tutoring requests, please email [uwteach@uw.edu](mailto:uwteach@uw.edu) or call 253.692.4417.

### **Campus Safety Information**

#### **Escort Service**

Safety escorts are available 24 hours a day, 7 days a week, there is no time limit. Call the main office line at 253.692.4416.

#### **In case of a fire alarm**

During an emergency evacuation, take your valuables ONLY if it is safe to do so. You could put yourself or someone else at risk by delaying your exit. Plan to return to class once the alarm has stopped. Do not return until you have received an all-clear from somebody "official," the web or email.

#### **In case of an earthquake**

DROP, COVER, and HOLD. Once the shaking stops, take your valuables and leave the building. Do not plan to return for the rest of the day. Do not return to the building until you have received an all-clear from somebody "official," the web or email.

For more information:

Campus Safety and Security: <http://www.tacoma.uw.edu/campus-safety/campus-safety-security>  
SafeCampus: <http://www.washington.edu/safecampus/uwt>

## Plagiarism

A major part of your experience at UW Tacoma will be reading, synthesizing, and using the knowledge and ideas of others. To plagiarize is to use the ideas—or unique phrasing of those ideas—without acknowledging that they originate from someone or someplace other than you. Attributing where you get your information builds your own authority to speak on that topic and provides valuable backing to the arguments you make. Attribution also distinguishes your ideas and words from those of others who came before you. At the University of Washington, plagiarism is a violation of the student conduct code, and the consequences can be serious. Though citing, quoting, and paraphrasing can be confusing at first, it is essential for your success at UWT that you familiarize yourself with these important conventions of academic writing. Additionally, plagiarism can be understood differently in various disciplines. For instance, the ways in which one summarizes others' ideas in texts, or attributes information from texts in one's own paper, are not the same in the sciences as they are in the humanities, or the social sciences. This means it is vital that you understand the specific expectations and guidelines for writing that will help you avoid plagiarizing in this class. If you have questions about what amounts to plagiarism, you are strongly encouraged to seek guidance from faculty and the Teaching and Learning Center as soon as possible.

For more information, please refer to:

Academic Honesty: <http://www.tacoma.uw.edu/uwt/enrollment-services/academic-honesty>

Student Counseling Center: <http://www.tacoma.uw.edu/counseling>

## Counseling Center

The Counseling Center offers short-term, problem-focused counseling to UW Tacoma students who may feel overwhelmed by the responsibilities of college, work, family, and relationships. Counselors are available to help students cope with stresses and personal issues that may interfere with their ability to perform in school. The service is provided confidentially and without additional charge to currently enrolled undergraduate and graduate students. To schedule an appointment, please call 253.692.4522, email [uwtshaw@uw.edu](mailto:uwtshaw@uw.edu), or stop by the Student Counseling Center (SCC), located in MAT 354. Additional information can also be found by visiting <http://www.tacoma.uw.edu/counseling>.

## Library

The UW Tacoma Library provides resources and services to support finding resources for your assignments. We guide students through the research process, helping you learn how to develop effective strategies and find and evaluate appropriate resources. In addition to research and instructional support, we manage course reserves and print and digital collections and provide spaces for group and individual study. For assistance or more information, visit our service desks, located in SNO and TLB, or our website, <http://www.tacoma.uw.edu/uwt/library>.

## Incomplete

[http://www.washington.edu/students/gencat/front/Grading\\_Sys.html#I](http://www.washington.edu/students/gencat/front/Grading_Sys.html#I)

An Incomplete is given only when the student has been in attendance and has done satisfactory work until within two weeks of the end of the quarter and has furnished proof satisfactory to the instructor that the work cannot be completed because of illness or other circumstances beyond the student's control. A written statement of the reason for the giving of the Incomplete, listing the work which the student will need to do to remove it, must be filed by the instructor with the head of the department or the dean of the college in which the course is given.

## **Email Policy**

<http://www.tacoma.uw.edu/information-technology/uw-tacoma-email-policy>

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