

TCORE 102: INTRODUCTION TO SCIENCE

LEARNING TO LIVE WITH STATISTICS AND BIG DATA

When: 1:30 to 3:30pm
Tuesday/Thursday

Where: Tioga Library Building 115

This syllabus is subject to change due to conditions arising throughout the quarter. Any changes to the syllabus will be announced in class and communicated on Canvas.

Instructor: Ander Erickson

Office: MDS 212A

Email: awerick@uw.edu

“Office” Hours: Tuesday and Thursday 3:40 to 4:40pm (**in the TLC!!**) or by appointment in my actual office.

Required Textbook: There is no required textbook but there are required readings which will be posted to Canvas.

Course Description: What does it take to be an effective yet critical consumer of quantitative claims? Statistics and big data have the potential to empower the individual while revealing patterns of discrimination and oppression. However, those same tools can be used mislead, manipulate, and reinforce systemic bias. This course will explore the use and misuse of quantitative data, heuristics and biases, pseudoscience, statistical literacy, causal inference and more.

Student Learning Outcomes: By the end of the course students should be able to-

- Define and describe scientific inquiry as a collective human endeavor.
- Provide a basic explanation of the methods and goals of both descriptive and inferential statistics.
- Identify common logical and statistical fallacies.
- Recognize the limits of conclusions that can be drawn with statistical reasoning or reasoning from data.
- Make use of scholarly databases in order to investigate knowledge claims.
- Recognize many of the uses and misuses of big data.
- Recognize common heuristics and biases.
- Employ distinction between science and pseudoscience.

Grades:

The following weighting dictates your final grade in the class:

Assignments	30%
Participation / Warm-Up Questions	30%
Group Project	15%
Individual Project	25%

Overall grades will be computed first as percentages, and then converted to UW's decimal grade point system according to the following table.

Letter	%	Grade Point	Letter	%	Grade Point	Letter	%	Grade Point	Letter	%	Grade Point
A	97+	4.0	B	86	3.1		77	2.2		68	1.3
	94 - 96	3.9		85	3.0	C	76	2.1		67	1.2
A -	93	3.8		84	2.9		75	2.0	D	66	1.1
	92	3.7	B-	83	2.8		74	1.9		65	1.0
	91	3.6		82	2.7	C-	73	1.8		64	0.9
	90	3.5		81	2.6		72	1.7	D-	63-62	0.8
B+	89	3.4		80	2.5		71	1.6		61-60	0.7
	88	3.3	C+	79	2.4		70	1.5	E	59-0	0.0
	87	3.2		78	2.3	D+	69	1.4			

Assignments: The purpose of the homework in this course is to give you an opportunity to engage with the ideas presented during class, to develop your ability to make use of the academic resources available at the university, and to critically evaluate quantitative claims. You will be assigned homework weekly that will be due by the end of day each Tuesday.

Warm-up Questions: There will be a warm-up question at the beginning of each class period designed to lead into the day's discussion. You will be able to make up any three of these questions and your lowest grade will be thrown out.

Group Project: There will be a group project and presentation at the end of the quarter in which you will investigate a quantitative and/or data driven claim

encountered in the media. You will need to find sources, create a handout, give a presentation in class, and lead a discussion on your topic. Groups will consist of 2 to 3 students, with group composition and topic subject to instructor approval.

Individual Project: The final goal of this project is for you to compose a “popular science article” designed to help readers navigate a statistical or data driven topic. There will be four components to this project throughout the quarter: (1) an annotated bibliography, (2) first draft of your article, (3) peer reviews and (4) final draft of your article.

Schedule

Th	September 27	Intro to Science, Statistics & Big Data I
T	October 2	Intro to Science, Statistics & Big Data II
Th	October 4	Descriptive Statistics I
T	October 9	Descriptive Statistics II: Measurement
Th	October 11	Confidence Intervals
T	October 16	Significance Tests
Th	October 18	Correlation & Causal Inference I
T	October 23	Correlation & Causal Inference II
Th	October 25	Statistical Literacy I
T	October 30	Statistical Literacy II
Th	November 1	Heuristics & Biases
T	November 6	Fallacies, Frequentism, Etc.
Th	November 8	Data Representation
T	November 13	Polling
Th	November 15	Understanding the Natural World
T	November 20	Understanding the Social World
Th	November 22	NO CLASS
T	November 27	Pseudoscience
Th	November 29	Algorithms and Systemic Bias
T	December 4	Mathematical Models and Feedback Loops
Th	December 6	Final Presentations & Discussions
T	December 11	Final Presentations & Discussions II (FINAL MEETING)

Policies and Expectations

- **Academic Calendar** - Dates for course drop, withdrawal, and instruction.
- **Plagiarism & Academic Honesty** - 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.
- **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.
 - **Campus Safety's "Are You Ready?" website**

- Emergency Response
- Sign-up for UW Alert: washington.edu/safety/alert/
- **Safe Campus** - Preventing violence is a shared responsibility in which everyone at the UW plays apart. The SafeCampus website (washington.edu/safecampus/uwt/) provides information on counseling and safety resources, University policies, and violence reporting requirements help us maintain a safe personal, work and learning environment.
- **Inclement Weather** - Always check the UWT Home Page: 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.
- "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."
- **Email Policy** - "UW Tacoma employees and students are issued a University of Washington NetID and email account. University email communications will only be sent to their University of Washington email address. Faculty and staff are not obligated to respond to students using non-UW email accounts. Those who choose to forward their emails to a non-UW email address do so at their own risk. The University is not responsible for any difficulties that may occur in the proper or timely transmission or access of email forwarded to any email address, and any such problems will not absolve employees and students of their responsibility to know and comply with the content of electronic university communications sent to UW email addresses." *For the complete Policy Statement, follow the link in the heading title*
- **Electronic Devices** - Electronic devices (including, but not limited to, cell phones, tablets and laptops) 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.
- **Infants/Children in Class Policy** - Mothers who are breastfeeding an infant, or expressing milk, may do so in class without the permission of the instructor. Or if you prefer to breastfeed or breast-pump outside of class, you may take time out of class to use a lactation room (GWP 410 & MAT 204A). However, in either case, it is a good idea to communicate with the instructor ahead of time. If you want to bring an older infant or child(ren) to class, you must get permission from the instructor ahead of time. If permission is granted, you are responsible for seeing that the child or children are not disruptive to the class and for ensuring that all additional University policies and rules are followed by those that you bring.
- **Incomplete** - 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.

Getting Help

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 (Office of Student Success)** - 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, or email at drsugt@uw.edu for assistance.
- **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, tacoma.uw.edu/library/library.
- **Research Support** - Get assistance starting a research project.
- **Subject Librarians** - Make an appointment with a subject librarian to talk about library resources, research strategies, focusing a topic, evaluating information and more.
- **Teaching and Learning Center** - The Teaching and Learning Center 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 tacoma.uw.edu/tlc. For

special needs or subject tutoring requests, please email uwtteach@uw.edu or call 253-692-4417. (TLC) 2nd floor of the Snoqualmie building

- **Writing support:** writing consultations, online tutoring, workshops & support
- **Quantitative skills support:** peer tutoring available for math, science, statistics and more...
- **ESL Support** - Help for students whose first language is not English
- **Technology Support** - Labs, software, equipment checkout and help with Canvas, Google, email, logins, etc.

Self and Family Support

Everyone needs a little help sometimes. Here are a few campus resources on campus to help you get through those challenging times.

- **Bias Incident Reporting Website** - A resource for anyone who needs to report an incident of bias or wants to explore and better understand issues like bias and discrimination, and how to effectively respond.
- **Center for Equity & Inclusion** (WCG 104) - Resources and support for students regarding diversity, equity, inclusion and social justice issues.
- **Student Success Mentoring Program** - Connect with a faculty or staff mentor
- **Military-Connected Student Statement** - If you are a student who is a veteran, on active duty, in the reserves or national guard, or a military spouse or dependent, then stay in contact with your instructor if any aspect of your present or prior service or family situation makes it difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make your instructor aware of any complication, then he/she will work with you and, if needed, put you in contact with university staff who are trained to assist you. Campus resource for veterans, service members, and families are located in the Veteran and Military Resource Center, TLB 307A. The VMRC can be reached at uwtva@uw.ed, 253-692-4923
- **Counseling Center (Office of Student Success)** - 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, or stop by the Student Counseling Center (SCC), located in

MAT 354. Additional information can also be found by visiting www.tacoma.uw.edu/counseling.

- **UWT student Health Center** - All UW Tacoma students who pay the [Services and Activities Fee \(SAF\)](#) now receive student health services at six Franciscan Prompt Care clinics: [Bonney Lake](#), [Burien](#), [Gig Harbor](#), [Lakewood](#), [Puyallup](#), [Tacoma](#). The “distributive care model” provides students more ways to access health care through six CHI Franciscan Health prompt care facilities throughout the Puget Sound, as well as access to [Franciscan Virtual Urgent Care](#), at no additional cost. The Franciscan Prompt Care clinic located across the street from St. Joseph Medical Center, just up the hill from campus, is designated as the UW Tacoma clinic where students will receive priority treatment. The former Student Health Services clinic located in Laborer’s Hall on Market Street has closed. These changes do not affect which students can utilize Student Health Services. All current SAF-paying UW Tacoma students have access to Student Health Services, even those who have health insurance. **All appointments are now scheduled by calling 253.428.2200.**
- **The Pantry** - Providing supplemental, nutritional, and culturally relevant food as well as hygiene items to all UWT students and their families. Stop by during weekly drop-in hours (DOUGAN 104) Monday-Thursday, 9am-3pm or complete the online Food Request Form at tacoma.uw.edu/thepantry.
- **Shelter for Young adults near our campus:** Beacon Center - Shelter for young adults 18-24. Open daily 6:30pm – 6:30am. Doors close at 10 pm. Located at: Beacon Senior Center 415 South 13th Street Tacoma, WA. The shelter has 40 beds and serves young people ages 18-24. Please call 253-256-3087 for more information. <http://www.communityyouthservices.org/piercecounty.shtml>
- **Oasis center** - Oasis transforms the lives of queer youth by creating a safe place to learn, connect, and thrive. Oasis envisions a world in which queer youth are valued in the community as strong, creative leaders. Oasis is the only drop-in and support center dedicated to the needs of LGBTQ youth ages 14-24 in Pierce County. We are a youth-adult partnership in which youth and adults come together for shared teaching learning and action! **Office Phone: 253-671-2838.** Emergency Cell Phone: (253) 988-2108
- **Short-Term Loans** - The Office of Student Financial Aid has funds available for short-term loans to assist students with temporary cash flow problems. Funds are generally available within one to four working days, only to students who are currently attending the university (loans cannot be processed between quarters). Repayment is due by the next quarter, or whenever additional funds such as financial aid arrive on account, whichever comes first. There is no interest on the short-term loans but there is a service charge added to the repayment amount. Students may apply online through [MyUW](#) under "Personal Services." Paper application forms are also available in the Financial Aid Office, but the processing time is longer. [Learn more about short-term loans](#)