



MAT 225 Basic Statistics

Class Days/Times/Room: Monday and Wednesday 3:30 to 4:45, room 24, Main/S-cuk To:k Campus	Autumn / <i>wi'ihanig</i> 2017
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Instructor: Richard LEE	Regular Phone: 520 383 0062 Cell Phone/Voice Mail: 520 205 2123 (text acceptable: be professional!) E-mail: rlee@tocc.edu or rlee@glasscity.net Office location: 121 ha-mascamdam ha-ki Office hours: TBA Monday and Wednesday, and as needed
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Course Description:

Introduction to statistical concepts and methods of business. Includes statistics, data, and statistical thinking; methods for describing sets of data, probability, sampling distributions, inferences based on single sample and two samples; estimation with confidence intervals and tests of hypothesis, correlation and regression - *if time permits: time series, design of experiments and analysis of variance (ANOVA), and categorical data analysis.*

Course Objectives:

During this course students will:

- analyze and describe both numerical and categorical data using various statistical techniques, from the simple to the complex, and apply it to various business situations.
- use the laws of probability to see not only how often something should happen, but to also see if the data prove or disprove a proposal, "fact," or idea -- henceforth called a hypothesis (the glorified word for guess)

Student Learning Outcomes (SLOs) :**After completion of the course students will be able to:**

1. Describe the different types of data collected and the fundamental elements of statistics.
2. Discuss descriptive statistics of data including measures of central tendency, variability and standard deviation, and relative standing.
3. Calculate probability.
4. Demonstrate sampling distributions and discuss the central limit theorem.
5. Explain confidence intervals and demonstrate statistical inferences based on a single population: tests of hypotheses.
6. Demonstrate statistical inferences based on two populations: confidence intervals and tests of hypotheses.
7. Explain correlation and regression.
8. Discuss time series data.
9. Discuss design of experiments and analysis of variance.
10. Use Excel or alternative statistical packages, including iPad applications and built-in software in the TI-83 calculator to calculate statistics.

Course Structure:

This course will be operating on a combination of traditional lecture, group activity, and discussions that will enhance the student's knowledge of statistical concepts. Some of this work will need to be done outside of class.

Texts and Materials: *No text needed - I will provide materials. That being said, I am "inspired" by OpenStax's free online Introductory Statistics by Illowsky, Dean et al. (<https://openstax.org/details/books/introductory-statistics>). Some form of calculating device is essential, although you will have access to all of TOCC's computers. It is strongly recommended that you have working knowledge of Excel.*

Evaluation and Grading & Assignments:

Two tests at 100 points = 200
One comprehensive final exam = 100
Homework in its totality = 200
Total possible points = 500

Some portion of the tests AND the final may consist of a take-home project requiring a substantial amount of both college-level writing AND good computing technique -- use of Excel or Google Spreadsheet on any platform (PC, iPad, cellphone) will be avidly encouraged. Be prepared to explain how you got the answer to any question.

To guarantee an A, you must have $500 \times .9 = 450$ points. A B will require $500 \times .8 = 400$ points.

Himdag Cultural Component:

My interpretation of what Nahban said in *the Desert Smells Like Rain* is this: while the *himdag* discourages direct, exact answers, in the mathematical world, one is expected to be able to come up with a precise answer for the situation. That being said, there are a few common issues shared:

- *Baban* (coyotes) are not going to affect your homework or my tests – they didn't write either.
- While one must go through a maze to see *i'toi*, there was no mention as to how many mazes there were to get to him. Likewise, you will discover in this course that there are many different ways to perform the algebra necessary to see the final answer.
- *I-we:tma*: for your success and the college's and the community's, you should not go work on mathematics alone – it can be a group activity (except on the tests, of course).
- *T-Wohocudadag c t-apedag c t-pik elida*: We learn for our well-being. We respect each other, ourselves and our community. We respect and take pride in our own work. We respect each other's abilities, quirks and privacy. We believe in ourselves and others.

Policies and expectations-

- For the level of course that you are in, I will assume that you are mature enough for me **not** to grade for attendance. However, our Governments (TON and Federal) require me to take it for financial aid purposes. I understand if you miss class for legitimate reasons: E-mailing the instructor and contacting the front office **5203838401** are the best ways of letting me know if you miss class. You still are responsible for any material covered in class.
- Integrity and Honor: I don't mind if you work on the homework in groups. In fact, I expect it. (See *i-we:tma* beforehand.) I do mind for tests and the final exam. Everything else about this topic is available in *the TOCC Student Handbook*.
- Homework and Feedback: We are adults: Although I expect homework to be done as soon as the topic(s) are covered, I understand that it may be late. Just get it done, really. I will try to return homework within one class – not every question will be checked, but I will be using what you have done wrong as a springboard for class. (If you're wondering how I can get away with accepting late homework, we do have a thing called a test. ☺) For this semester, you should spend 3 credit hrs x 3 hrs per credit hr in the fall = **9** hours a week on this course.
- Withdrawal: Final deadline is **October 26th, 2017**. By that date, you will have had at least one test. As a general rule, if you have been absent more than 25% of the time (8 classes), you should speak with an adviser immediately. *All institutions of higher education strongly encourage instructors NEVER to ask students to withdraw from a course for both financial aid purposes and respect for the student.* (See *t-pik elida* on previous page.) Again, we will have two tests, a final exam and homework count for a grade..
- Incompletes (I): The nature of this course (where you are learning something new every single class) makes it very improbable for an incomplete to be given. However, per TOCC policy, if you have completed $\frac{3}{4}$ of the course and specifically request it, I may consider it. *Please call before final exams to assure enough time to consider your request.* In handing out an incomplete, I will assume that you will:
 - finish this course on your own time.
 - receive a form with the I grade filled in and what work *must* be done to complete the course.
 - have one year to complete the work, else the grade becomes an F.
- Makeups: My homework policy has been mentioned beforehand. As for exams, I allow a *reasonable* amount of time – not more than two weeks.
- Extra credit: None available.
- Final grades: They will be sent to the address on record. Per FERPA and the Himdag, I will not give grades over the phone and am strongly discouraged from e-mailing same. (Again, see *t-pik elida* above.)
- Struggling? Tutoring is available in the Student Success Center in the main building. That being said, I take text messages, e-mails and phone calls at any hour.
- In accordance with *t-pik elida* and the Americans with Disability Act 1990 (ADA) and Section 504 of the Rehabilitation Act, if you have a learning problem, physical disability, or medical illness that requires you to have any special arrangements, please inform your instructor at the beginning of the semester so your academic performance will not suffer because of the disability or handicap.

Consolidated Course Outline and Homework Assignments. I am going to assume that you have had coursework equivalent to college algebra. If not, see me privately as soon as possible. With this being the fourth time for me teaching this course, everything you see here is subject to change.

Section	Problems - tentative	Done?
Preliminaries	(8/14, 8/16) Consider all of the terms I've mentioned in class. -- There will be an in-class small essay, along the lines of: Given what you know of the terms <i>population</i> , <i>sample</i> , <i>parameter</i> and <i>statistic</i> , why is conducting a survey or an experiment very difficult to do with ANY Native population? Feel free to state anything you know about the <i>himdag</i> . Definitions handout # 42 to 79, due 8/21.	
Displaying your data, and what variables go with what data display	(8/21 - watch your eyes, 8/23) Find Native-related examples of at least two of the following: Pie chart, bar graph, frequency table, histogram, dotplot, stem-and-leaf-plot, scatterplot. Also, gas tax handout (visuals) - make dotplot and stem-and-leaf by hand, and histogram by software, due 8/28.	
Measures, measures and even more measures... s-eda nu:milo c na:nko / "middle number" and spread... not to mention location	(8/28, 8/30, 9/6, 9/11, 9/13) Gas tax handout (numbers) - using software, find mean, median (and if it exists, mode)... also range and standard deviation. Find the five number summary for the gas tax. Also, calculate what percentile Arizona falls in for same, due 9/18, the day of test 1.	
Probability - how often something should happen - and how we keep the lights on at Desert Diamond part 1	(9/20,9/25,9/27 - no class 9/29 o'odham taş) Probability homework handout questions 5, 11, 17-21, 37, 54-57 due 10/2.	
Expected value - what should you get or pay out on the average - how we keep the lights on at Desert Diamond part 2... and the essential difference between Natives and Miligan with expected value.	(10/2 - no class 10/4 St. Francis taş - 10/9) Please read the o'odham dice game handout before class. Expected value homework handout questions 70 and 72, really, due 10/11.	
Regression and correlation	(10/11, 10/16, 10/18) HWTBA	
Normality - most data isn't - and central limit theorem	(10/23, 10/25, 10/30) HWTBA test 2 tentatively 10/30	

Getting your target parameter via <i>hapot himdag</i> - confidence intervals	(11/1, 11/6, 11/8 - no class 11/10 cucegiakuđ taş) HWTBA	
Hypothesis testing, or did they honor the treaties?	(11/13, 11/15, 11/20, 11/22) HWTBA	
Other interesting topics as needed, based on class interest	(11/27, 11/29) HWTBA	
	Final exam 12/4	

DISCLAIMER: This syllabus is designed to evolve and change throughout the semester based on class progress and interests. You will be notified of any changes as they occur.

References:

- Culin, Stewart. (1975.) *Games of the North American Indians*. New York: Dover Publications.
- Guarin, Jorge. (2011.) *Course syllabus*.
- Hronopoulos, Sophia. (2012.) *Course syllabus*.
- Nabhan, Gary Paul. (1982.) *The Desert Smells Like Rain: A naturalist in Papago Indian Country*. San Francisco: North Point Press.
- Newberry, Teresa. (2012.) *Course syllabus*.
- Sun-bat, Catherine. (2014.) *Course syllabus*
- Tohono O'odham Community College core values website http://www.tocc.edu/core_values.htm (2015.)

Assignment	Date	Score
Test 1	9/18/17	
Test 2	10/23/17	
Final	12/4/17	
Homework	various	200 x __ (number of assignments checked in) / __ total assigned = _____
Total		Add the numbers you have in this column = _____