



<b>Semester:</b>	Spring	<b>Year:</b>	2023
<b>Class Day/Time:</b>	Online	<b>Class Location:</b>	Online
<b>Instructor of Record:</b>	Harrison Ndetan, MPH, MD, PhD		Instructor
<b>Office:</b>	H251		
<b>Office Phone:</b>	(903) 877-1405		
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<b>Office Hours:</b>	By Appointment Online		

**Course Description:**

This course provides an introductory overview of common statistical concepts and methods used in public health. It emphasizes general ideas, application, and interpretations in lieu of mathematical rigor. Topics include descriptive statistics, probability, probability distributions, estimation, hypothesis testing, power, linear regression and correlation, analysis of variance, nonparametric statistics, and use of statistical software. In addition, other topics such as logistic regression and survival analysis may be covered at an elementary level.

**Prerequisite:** Admission to the School of Community & Rural Health

**Co-requisite:** N/A

**Student Learning Outcomes (SLO or “course objective”):**

The foundational learning objective for this course is: Explain the role of quantitative & qualitative methods & sciences to describe & assess a population’s health. Students are introduced to the concepts of summarizing data from a sample and making inferences to a population in a process of addressing a public health problem. This requires understanding the types and measurement levels of the key variables underlying a research question, the concept of probability distribution and various statistical tests involved in univariate and bivariate statistical inferences. Students will demonstrate mastery through graded weekly quizzes, team-based problem-solving assignments, and an applied public health project that requires providing a biostatistics perspective to a public health issue.

This course will address the following 3 areas of competencies, constituting the student learning outcomes (SLO):.

- SLO1. Analyze quantitative & qualitative data using appropriate biostatistics, informatics, computer-based programming & software such as SPSS (PLO 1.1, 3, 4, 5.1, 6);
- SLO2. Interpret results of data analysis for public health research, policy or practice (1.1, 3, 5.1, 6);
- SLO3. Communicate audience-appropriate public health context, through both written & oral presentation (1.1, 4).

**Course Assessment/Methods of Evaluation:**

**Course Requirements and Grading:**

**Students are expected to keep track of their performance throughout the semester and seek guidance from instructor if their performance drops below satisfactory levels.** Grades will be based on the number of points earned in individual quizzes (SLO1: PLO1.1, 6), individual homework and team-based assignments (SLO1,2,3: PLO1.1, 4, 5, 6), and applied public health project (SLO1,2,3: (PLO 1.1, 3, 4, 5.1, 6). On a percentage basis, final grades will be computed as: 90%+ = A, 80%-89% = B, 70%-79% = C, 60%-69% = D, < 60% = F.



**Homework/Team-based Assignments (30%):** Selected problems from the textbook will be assigned as part of the homework for each other week (10%). Each week's homework assignments will be posted on Canvas on Monday by 9:00am. Completed homework assignments need to be submitted to the corresponding assignment entry on Canvas by **11:59pm on Sunday of the assigned week**. Emailed assignments will not be accepted. Homework submissions will be evaluated based on the extent to which the problems are solved correctly. Individual point allocation will be dependent upon the number of problems. Students must show complete work to be considered for full credit. Since the assignments will involve mathematical symbols, Greek letters and fractions, you may find it easy to solve the problems using pencil and paper and scan and upload your written work. You can always type your answers if you choose to do so. Students may also take photograph of their answer sheets and upload those files. When you take photographs, you need to make sure that the photographs have good resolution and are clearly legible. Work determined by the instructor to be illegible will not be graded and student will receive a score of zero. In order to receive credit for hand calculation problem, you need to show your work step-by-step. **No late work is accepted.**

Students will be assigned groups or teams. The previous week's homework or separate assignments will be completed again in their assigned teams/groups the following week. This week gives student the opportunity to get grounded with the material presented the previous week, interact with one another and the material, and help enhance each other's learning experience. It is essential that each student be prepared before team's meeting and participate actively in groups discussion, solving and presentation of assigned problems during meetings. Students would be expected to grade team members' participation using a rubric. **Completed assignments are due by 11:59PM on Sunday of the assigned week.**

**Team-based assignments submitted after deadline but before the solutions are provided will be graded at 75% after which the student will earn a zero.** Solutions are usually posted less than two days after due date of each assignment.

**Quizzes (20%):** A total of 7 closed-book quizzes will be assigned on Monday of the week of Team-based assignments, based on the material of the previous week. They will involve multiple choice questions and true-false questions. Typically multiple choice questions would involve some computations in order to decide the right answer. Quizzes will run for 15 minutes and can be taken any time on the assigned day. Once you access the quiz for the first time, the clock will start, and it is recommended that you complete it in one sitting. Quiz will not be available after the due date and **no makeup will be provided**. Quizzes are meant to ensure that students are prepared for the team base assignment of that week and are ready to actively interact with and contribute meaning to team members' learning experience.

**Project (50%):** An applied public health project (APHP) will be assigned at the beginning of the course and the students are required to work on it throughout the semester. The project will involve the application of concepts learned in the course in providing a Biostatistics perspective to a public health problem. This will entail formulating appropriate research questions, hypotheses or objectives based on the understanding of a public health problem and provided data, analyzing the provided data, interpreting and reporting the results of the analysis. APHP will be accomplished in three parts as follows: Part 1: Focused on descriptive statistics (15%); Part 2: Adding inferential statistics (15%) and Part 3 (Final): Extending inferential statistics and rapping up. The deliverables for each part will be a complete empirical research manuscript (with all parts of the manuscript) as well as a powerpoint presentation (slides with voice over) at the final. Students will work on their APHP in their assigned teams but submit work individually written reports (manuscript). They will grade their team members participation in group discussions. APHP will be graded based on a

rubric that would include individual demonstration of SLO1, 2, 3 above. Work must be completed on stipulated due dates to earn any points. Due dates for the projects are detailed below in the course content section.

### **Assigned article readings and discussion forum (2% bonus points towards final course grade)**

Each week an article will be assigned related to the material covered and a few questions concerning the assigned article will be posted on the discussion forum of the week of the teamwork. Students are encouraged to read the article, ask and answer questions related to the article from fellow students in the discussion forum. This forum offers students the opportunity to interact with themselves and enhance their learning experience on the concepts covered the week before. Participation in this forum will be graded for 2% bonus points that will count towards the final course grade.

**NOTE: Apart from Quizzes, all assignments including project are due 11:59PM on the assigned week**

Quizzes	= 20%
Project	= 50%
Homework	= 10%
Teamwork	= 20%

### **Linked Program Learning Outcomes:**

The student learning outcomes listed above address the following MPH Program PLOs:

- PLO1 - The student will demonstrate mastery in each of the five core knowledge areas in public health: Biostatistics, Epidemiology, Social & Behavioral Sciences, Health Policy and Management, and Environmental Health Sciences.
- PLO3 - The student will demonstrate proficiency in using multiple informational resources to gather, analyze, apply and report solutions to public health problems with a special emphasis on rural community health.
- PLO4 - The student will demonstrate proficiency in English communication in both oral (public speaking) and written forms as they pertain to conveying key concepts in public health.
- PLO5 - The student will demonstrate proficiency in using computers and other forms of digital technology and media as they pertain to research, office management and public health issues.
- PLO6 - The student will demonstrate independent and critical thinking skills.

### **Textbook:**

Biostatistics: A Foundation for Analysis in the Health Sciences, 11th Edition. Wayne W. Daniel & Chad L. Cross, 2018 Wiley, ISBN: 978-1-119-49657-1

<https://www.wiley.com/en-us/Biostatistics%3A+A+Foundation+for+Analysis+in+the+Health+Sciences%2C+11th+Edition-p-9781119496571>

### **Recommended (Optional) Textbook:**

Intermediate Statistics Using SPSS. Herschel Knapp. © 2018, SAGE Publications, ISBN: 978-1-5063-7743-8

<https://methods.sagepub.com/book/intermediate-statistics-using-spss>  
<https://dx.doi.org/10.4135/9781071802625>

The 7 Steps of Data Analysis: A Manual for Conducting a Quantitative Research Study

By William M. Bannon, Jr., PhD

<http://www.statswhisperer.com/books/>



**Required supplies:**

- A calculator will be needed.
- You will need to purchase SPSS statistical software and install on your personal laptop computer. You will use the software both at home and during class. SPSS Statistical software is available for purchase through the University of Texas at Tyler bookstore. Make sure the package you get have the capabilities of completing the basic statistical tests covered in the course: Descriptive statistics, t-tests, chi-square tests, cross tabs, linear and logistic regressions, correlation, ANOVA and nonparametric statistics.

**Course Content:**

Week	Date	Course Session Topic	Instructor	Assigned Readings	Assessment
1	Jan. 9 - 15	Introduction, Basic concepts, Type of variables, Measurement Scales; Descriptive Statistics: Measures of location and spread, Statistical graphics; Introduction to SPSS	Ndetan	Ch 1-2	HW#1 General Discussion
2	Jan. 16 - 22	Teamwork	Ndetan	Ch 1-2	Quiz#1/TW#1 Journal Article Discussion
3	Jan. 23 - 29	Probability: Properties of Probability, Calculation, Union and intersection of events, Conditional probability, Bayes Theorem	Ndetan	Ch 3	HW#2 General Discussion
4	Jan. 30 - Feb. 5	Teamwork	Ndetan	Ch 3	Quiz#2/TW#2 Journal Article Discussion
<b>APHP PART 1</b>					
5	Feb. 6 - 12	Probability distributions, Mean and variance for probability distribution, Binomial & Poisson Distributions; Probability distributions: Normal distribution; Sampling distribution, Central limit theorem	Ndetan	Ch 4,5	HW#3 General Discussion
6	Feb. 13 - 19	Team work	Ndetan	Ch 4-5	Quiz#3/TW#3 Journal Article Discussion
7	Feb. 20 - 26	Statistical Inference: point estimation & confidence interval; Student t-distribution; General concept, One-sample Statistical Inference: point estimation & confidence interval; Two-sample	Ndetan	Ch 6	HW#4 General Discussion
8	Feb. 27 - Mar. 5	Teamwork	Ndetan	Ch 6	Quiz#4/TW#4 Journal Article Discussion
9	Mar. 6 - 10	Hypothesis testing; One-sample inference; Continuous variable and Proportion	Ndetan	Ch 7	HW#5 General Discussion



		Hypothesis testing; Two-sample inference; Paired and independent samples			
10	<b>Mar. 13 - 19</b>	<b>SPRING BREAK</b>			
11	Mar. 20 - 26	Teamwork	Ndetan	Ch 7	Quiz#5/TW#5 Journal Article Discussion <b>APHP PART 2</b>
12	Mar. 27 – Apr. 2	Analysis of frequencies; Chi-square distribution; Goodness-of-fit test; Test for homogeneity; Fisher’s exact test; Introduction to study designs in Public Health; Relative Risk; Odds Ratio	Ndetan	Ch 12, 8 (8.1 – 8.3)	HW#6 General Discussion
13	Apr. 3 - 9	Teamwork	Ndetan	Ch 12, 8	Quiz#6/TW#6 Journal Article Discussion
14	Apr. 10 - 16	Introduction to regression analysis; Simple linear regression; Regression with a single independent variable; Interpretation of Tests for Slope and Intercept; Prediction of a new value of Y; Correlation and determination coefficients Analysis of variance (ANOVA) - Complete Randomized Design; F distribution; One-way ANOVA – fixed effect	Ndetan	Ch 9 Ch 8 (8.4 – 8.6)	HW#7 General Discussion
15	Apr. 17 - 23	Teamwork	Ndetan	Ch 9, 8	Quiz#7/TW#7 Journal Article Discussion
16	<b>Apr. 24 - 30</b>	<b>FINAL APHP report – Empirical research manuscript/Presentation</b>	<b>Ndetan</b>		<b>APHP FINAL Report</b>

*The course syllabus is a guide for this class, but it is subject to change. Students will be informed of any change in content or exam/assignment dates.*

## Other Class Policies

### Attendance / Participation:

Regular and punctual attendance is expected. You should arrive on time and participate in all class activities. If a student misses a class or lab, the student is responsible for obtaining any information distributed during those times. Make-ups are possible only under certain instances. Arrangements for any make-ups should be discussed directly with the instructor for that day’s class.

### Email Correspondence:

All email correspondence will be through the UTHSCT email system. Personal email accounts will not be used for any class-related matters (ex. assignments, absence notifications, grades, etc.). All students are responsible for checking their UTHSCT email account regularly. Any questions regarding UTHSCT individual student email accounts should be addressed to the Help Desk at 903.877.7700.

## **Academic Honesty:**

Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

### Cheating

Dishonesty of any kind involving examinations, assignments, alteration of records, wrongful possession of examinations, and unpermitted submission of duplicate papers for multiple classes or unauthorized use of keys to examinations is considered cheating. Cheating includes but is not limited to:

- Using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class.
- Falsifying or inventing any information, including citations, on an assigned exercise.
- Helping or attempting to help another in an act of cheating or plagiarism.

### Plagiarism

Plagiarism is presenting the words or ideas of another person as if they were your own. Materials, even ideas, borrowed from others necessitate full and complete acknowledgment of the original authors. Offering the work of another as one's own is plagiarism and is unacceptable in the academic community. A lack of adequate recognition constitutes plagiarism, whether it utilizes a few sentences, whole paragraphs, articles, books, audio-visual materials, or even the writing of a fellow student. In addition, the presentation of material gathered, assembled or formatted by others as one's own is also plagiarism. Because the university takes such misconduct very seriously, the student is urged to carefully read university policies on Misconduct in Research and Other Scholarly Activity 05.00. Examples of plagiarism are:

- Submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another.
- Submitting a work that has been purchased or otherwise obtained from an Internet source or another source.
- Incorporating the words or ideas of an author into one's paper without giving the author due credit.

## **Adding/Dropping**

The official deadline for adding and dropping courses is as published in the academic calendar and Graduate Bulletin (typically the day before Census Day). However, students are strongly encouraged to meet with their graduate advisor or the Program Coordinator prior to adding/dropping courses. Movement into and out of classes after the 4th class day requires approval of the Program Director. Students can drop until mid-semester without a WP or WF. Drops after mid-semester require approval of the Dean. Each student is responsible for their own enrollment status with the university.

## **Disability Accommodations**

UTHSCT abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, which mandate reasonable accommodations be provided for students with documented disabilities. If you have a disability and may require some type of instructional and/or examination accommodations, please contact me early in the semester so that I can provide or facilitate provision of accommodations you may need. If you have not already done so, you will need to register with the Student Services Office (located on the UT Tyler Campus). You may call 903-566-7079 for more information.

## **Student Absence Due to Religious Observance**

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.



**Emergency Exits and Evacuation**

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit or action. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by the Health Center Police or Fire Department.

**Technical Support**

If you experience technical problems or have a technical question about this course, you can obtain assistance by emailing me at [Harrison.ndetan@uthct.edu](mailto:Harrison.ndetan@uthct.edu) or calling the Help Desk at 903.877.7700.