PBHL 5317 Biostatistics for Public Health I | Credit Hours: 3

Semester: Fall 2025 | Class Location: Online

Modules open on Sundays at 8 am. **All times are US CST**.

Instructor	Hosik Min, PhD, Associate Professor
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Office Hours	by Appointment

Prerequisite: None

Course Overview: This course provides an introductory overview of statistical concepts and methods used in public health. The topics will cover general ideas, application, and interpretations. Topics include descriptive statistics, probability, probability distributions, estimation, hypothesis testing, simple linear regression and correlation, analysis of variance, and use of statistical software. Each student will learn both statistical meanings and use of statistical software throughout the course.

Student Learning Outcomes:
By the end of the course, students should have a basic understanding of the fundamentals of biostatistical methods. This includes:

- Summarizing data with numerical measures and graphs
- Basic concepts of randomness and data distributions
- Point/Interval estimation for categorical and continuous outcomes
- Hypothesis testing for categorical and continuous outcomes
- Simple & multiple linear & logistic regression
- Interpreting output from statistical computing packages (e.g., Excel, Jamovi) to draw appropriate inferences, and to report results effectively
- Applying statistical procedures in the public health environment

MPH Generalist Program Competencies:
The course objectives listed above address the following CEPH &/or MPH program competencies.

CEPH Competencies
Evidence-based Approaches to Public Health
2. Select quantitative and qualitative data collection methods appropriate for a given public health context.
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming, and software, as appropriate.

4.	**Interpret results of data analysis for public health research, policy, or practice.**
Communication	
19.	**Communicate audience-appropriate public health content, both in writing and through oral presentation to a non-academic, non-peer audience with attention to factors such as literacy and health literacy.**

Required textbook (all free): I will use the BS as a min text and utilize others as supplementary ones.

1. Barbara Illowsky & Susan Dean (**BS**). 2023. ***Introductory Statistics 2e***. Open Stax. Wiley. ISBN: 9781961584327. https://openstax.org/subjects/math#Statistics

2. David Lane (**DL**). 2003. ***Introduction to Statistics***. https://open.umn.edu/opentextbooks/textbooks/introduction-to-statistics.

3. David Diez, Mine Cetinkaya-Rundel, & Christopher D Barr (**DCB**). 2019. ***OpenIntro Staistics***. 4th edition. https://www.biostat.jhsph.edu/~iruczins/teaching/books/2019.openintro.statistics.pdf.

4. Daniel Navarro & David Foxcroft (**NF**). ***Learning Statistics with Jamovi: A Tutorial for Beginners in Statistical Analysis*****.** ISBN: 9781800649392. https://www.openbookpublishers.com/books/10.11647/obp.0333.

5. Vishal D Pajankar (**VP**). 2022**.** ***Easy Statistics with Jamovi*****.** **https://www.researchgate.net/publication/368387691_Easy_Statistics_with_Jamovi_Use_of_Jamovi_for_beginners.**

6. Mathias Jesussek (**MJ**). 2023. ***Logistic Regression Playbook***. Datatab. https://datatab.net/assets/tutorial/playbook/Logistic_Regression_Playbook.pdf.

Recommended textbook:

Miller, Jane. 2015. ***The Chicago Guide to Writing about Multivariate Analysis***, 2nd Edition (April 9, 2015). University of Chicago Press. ISBN: 978-0226185637.

Cross, Chad L. & Daniel, Wayne W. 2018. ***Biostatistics: A Foundation for Analysis in the Health Sciences***, 11th Edition. Wiley. ISBN: 9781119496571. Some of the course examples are from here; I strongly recommend this book if you want to learn more about biostatistics.

All required textbooks are free and available online (I will upload them on Canvas, too). You may acquire the book via the internet through sources such as Majors Scientific Books or Amazon.com at discounted rates and it may be available for rent on Amazon. Any required supplemental readings will be posted on Canvas. Extensive reference materials are available at the Robert R. Muntz Library at UT Tyler and the Watson Wise Library at UT Health Science Center at Tyler.

Course Assessment / Methods of Evaluation

Readings: Textbook reading assignments are indicated in the course schedule. Additional assignments specific to each lecture will be posted as needed. Make sure to follow instructions

for assignment completion posted within each module. You are responsible for any additional materials provided, so please check Canvas regularly.

Assignments: Assignments will be given out throughout the course based on assigned readings and materials covered in each module as homework. The assignments will be worth 45% of your final grade. There will be a total of 12 assignments (50 points/each). **Assignments are due by Monday nights at 11:59pm.**

Synchronous Sessions: There will be a total of **8 synchronous sessions** that will be held via Zoom. Meetings will be on Tuesday evening (every first and third of the month) from 6 to 8 pm CST, each session will be recorded, cover the course materials for deeper understanding or be Q&A sessions. To obtain attendance points, each student MUST attend or submit a 1-page reflection paper on recordings for **4 out of 8 meetings**. A total of 5 % of final grade is designated for this activity.

Exams: Exams will utilize the real data analysis (BRFSS), interpretation, and oral presentation. The BRFSS (Behavioral Risk Factor Surveillance System) (https://www.cdc.gov/brfss/index.html) is the national health survey by phone interviewing, which has more than 400,000 adults each year. For the sake of class purpose, I minimized the data with selected variables for Texas only and provided the data for you through Canvas (**No need to download it individually from the BRFSS site**).

For the midterm (total 330 points), each student **1)** selects at least **ONE** health-related variable (e.g. cancer, diabetes, etc.) and at least **THREE** demographic variables (e.g., age, sex, race, marital status, etc.), **2)** analyzes each variable's ***descriptive statistics*** (frequencies, mean, median, standard deviation, minimum, maximum, etc.), and **3)** ***graphs*** (histogram and box plot), and **4)** interprets your results (you need to interpret each table and graph briefly, about 1-3 sentences). Then, each student will **5)** create ***Power-Point presentation*** slides, and **6)** submit ***an oral presentation file***.

For the final exam (total 330 points), each student MUST **1)** run ***statistical models***, using one health-related variable and at least 3 demographic variables and interpret your results. Again, each student will **2)** create ***Power-Point presentation*** slides and **3)** submit ***an oral presentation file*** with 4) ***your interpretations on your results***.

The oral presentation (including PowerPoint slides appropriately formatted and sourced) on their midterm and final projects. Details of the presentation, including the length and format of the presentation will be provided by the instructors.

Note: as for descriptives and model results, each student MUST submit 1) excel charts and 2) Jamovi results separately, but no need to write interpretation twice. Only one interpretation for excel charts will be enough.

Task	**Midterm**	**Final Exam**
Total Points	**330**	**330**
Selecting variables	15	
Creating a table(s) and a graph(s)	15	
Interpretation of each table/graph (1-3 sentences)	50	
Jamovi Results	50	50
Running a statistical model		80

Submitting a report (1-2 paragraphs)	50	50
PowerPoint presentation slides	100	100
Oral presentation file upload (5-10 minutes)	50	50

* Finals may not have graph(s); depending on the model you choose.

Extra Point: This course will offer one-time for extra points. Student who completed a course evaluation survey at the end of the semester and submit their screenshot on canvas (no need to submit your answers, but your completion message on screen). I will give you 20 points toward one of your assignments. For example, if your assignment #3 score was 80, your final score on assignment #3 will be 100.

Please be aware that **NO EXTRA CREDIT WILL BE GIVEN** ***except a course evaluation survey*** (10 points). The average of each student's grade will determine the final course grade, and no additional work will be allowed. The grades in the gradebook at the end of the semester are the final grades, no curves will be given.

MPH Competency #2, 3, 4, & 19
All assignments (homework), midterm and final exam will assess students' understanding of biostatistics based on each chapter. No multiple-choice questions will be given in this course, all assessment will be measured in assignments, analysis outputs, interpretation, writing, and oral presentation. Writing examples and rubrics will be given to students to follow.

Overall Grading Structure:	**Grading Scale (%)**:
10% - Participation	A = 90-100
40% - Homework	B = 80-89
25% - Midterm exam	C = 70-79
25% - Final exam	D = 60-69
	F = below 60

Student Responsibilities/Expectations ONLINE

Class etiquette dictates that you will:
1. Be active in class online as will be evidenced by participation in assigned activities as well as synchronous or asynchronous discussions.

2. Submit required assignments on time per requirement by the instructor. If there is any reason that may prevent a student from doing so, the student must inform the professor ahead of time and not make any excuses for failing to do so. It is your personal responsibility to complete assignments on time; make sure to use an electronic or paper calendar to keep up with your due dates for continued success in this course.

Email Correspondence: All email correspondence will be through the UT-Tyler/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 UT-Tyler/UTHSCT email accounts regularly. Also, we will utilize "Chat" function in Canvas.

AI use policy: I will allow you to use AI to do statistical software work, as AI can be very useful source to learn software with ease not only this semester but also in your future. **However**, I will not allow you to use AI to write your interpretation of results, tables, and figures. I assume this is your first time to write on statistical results, and writing may be one of your critical role or duties in your career. So, let's practice

in this course without AI. As you only need to write about one or two paragraphs, the writing part will not be a big burden. If I find you have used AI for your writing, your score on that assignment will be 0.

Late Assignments/ Assessments: Students need to contact the Professor if they anticipate submitting an assignment late. Any late assignments will be subject to a 5% deduction each day for the first week (35% if submitted a week late) and an additional 10% for each day thereafter. Assignments turned in over 2 weeks late (14 days) will receive a grade of 0 for the assignment. This policy includes homework and any assignment. Reasonable accommodations will be made under special circumstances. If you need special accommodations, you must contact the Professor BEFORE the due date for the assignment.

Course Schedule (can be changed with advanced notice)

Date	Topic	Competency	Read	Assessment
Part I. Descriptive Statistics				
Week 1				
8/25--29	Introduction, basic concepts, measurements, sampling Descriptive Statistics	CEPH #2	CH 1 CH 2	Assignment #1
Week 2				
9/1--5	Research Methods & Design Qualitative study	CEPH #2, #3	DL 6	Assignment #2
Week 3				
9/8--12	Software & Data Visualization Census date (9/8)	CEPH #3	NF 3-5 VP (-p.29)	Assignment #3
Week 4				
9/15--19	Probability Theory Discrete and continuous variables Types of distribution	CEPH #2, #3	CH 3-6	Assignment #4
Week 5				
9/22--26	Central Limit Theorem, Confidence intervals Hypothesis testing	CEPH #2, #3	CH 7-10	Assignment #5
Part II. Inferential Statistics				
Week 6				
9/29-10/3	ANOVA: Randomized design, repeated measured design, factorial experiment	CEPH #2, #3	CH 13 NF 13-14	Assignment #6
Week 7				
	BRFSS Data Explanation 1			
10/6--10	***Midterm Exam - Presentation***	CEPH #3, #4, #19		Oral presentation
Week 8				
10/13--17	Chi-square, goodness of fit, independence, homogeneity, fisher exact test, Mantel-Haenszel statistic	CEPH #2, #3	CH 11	Assignment #7
	Midterm Exam - Presentation	CEPH #3, #4, #19		Oral presentation
Week 9				

10/20--24	Simple linear regression, evaluation, correlation, coefficient	CEPH #2, #3	CH 12 NF 12	Assignment #8
Week 10				
10/27--31	Multiple regression and correlation model	CEPH #2, #3	DCB 9	Assignment #9
Week 11				
11/3--7	Logistic regression	CEPH #2, #3	CH 11, MJ	Assignment #10
Week 12				
11/10--14	Survival Analysis: Kaplan-Meier procedure, Cox regression, proportional hazards model	CEPH #2, #3		Assignment #11
Week 13				
11/17--21	Nonparametric statistics BRFSS Data Explanation 2	CEPH #2, #3		Assignment #12
Week 14 11/24--28	**Thanksgiving Holidays**			
Week 15				
12/1--5	***Final Exam - Presentation***	CEPH #3, #4, #19		Oral presentation

Student Resources:
Faculty can update student resources to provide additional supports appropriate for each course.

Resources to assist you in the course

- UT Tyler Student Accessibility and Resource (SAR) Office (provides needed accommodations to students with document needs related to access and learning)
- UT Tyler Writing Center
- The Mathematics Learning Center
- UT Tyler PASS Tutoring Center
- UT Tyler Supplemental Instruction
- Upswing (24/7 online tutoring) - covers nearly all undergraduate course areas
- Robert Muntz Library and Library Liaison
- Canvas 101 (learn to use Canvas, proctoring, Unicheck, and other software)
- Digital Support Toolkit (for supported courses only. Students are automatically enrolled in the toolkit for supported courses)
- LIB 422 -- Computer Lab where students can take a proctored exam
- The Career Success Center
- UT Tyler Testing Center
- Office of Research & Scholarship Design and Data Analysis Lab

Resources available to UT Tyler Students

- UT Tyler Counseling Center (available to all students)
- MySSP App (24/7 access to Student Support Program counseling through phone or chat and online wellness resources available in a variety of languages)
- Student Assistance and Advocacy Center
- Military and Veterans Success Center (supports for our military-affiliated students)
- UT Tyler Patriot Food Pantry
- UT Tyler Financial Aid and Scholarships
- UT Tyler Student Business Services (pay or set up payment plans, etc.)
- UT Tyler Registrar's Office
- Office of International Programs
- Title IX Reporting
- Patriots Engage (available to all students. Get engaged at UT Tyler.)

University Policies and Information

Withdrawing from Class
Students may withdraw (drop) from this course using the Withdrawal Portal. Withdrawing (dropping) this course can impact your Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please speak with your instructors, consider your options, speak with your advisor, and visit the One-Stop Service Center (STE 230) or email enroll@uttyler.edu to get a complete review of your student account and the possible impacts to withdrawing. We want you to make an informed decision. UT Tyler faculty and staff are here for you and often can provide additional support options or assistance. Make sure to carefully read the implications for withdrawing from a course and the instructions on using the Withdrawal portal..

Texas law prohibits students from dropping more than six courses during their entire undergraduate career*. The six courses dropped includes those from other 2-year or 4-year Texas public colleges and

universities. Consider the impact withdrawing from this class has on your academic progress and other areas, such as financial implications. We encourage you to consult your advisor(s) and Enrollment Services for additional guidance. **CAUTION #1**: Withdrawing before census day does not mean you get a full refund. Please see the Tuition and Fee Refund Schedule. **CAUTION #2**: All international students must check with the Office of International Programs before withdrawing. All international students are required to enroll full-time for fall and spring terms. **CAUTION #3:** All UT Tyler Athletes must check with the Athletic Academic Coordinator before withdrawing from a course. CAUTION #4: All veterans or military-affiliated students should consult with the Military and Veterans Success Center.

* Students who began college for the first time before 2007 are exempt from this law.

Artificial Intelligence Statement

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy. *Refer to the About This Course section of the UT Tyler Syllabus Module for specific information on appropriate use of AI in your course(s).*

Final Exam Policy

Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the Dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members must maintain student final examination papers for a minimum of three months following the examination date.

Incomplete Grade Policy

If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in place of a grade *only when **all** of the following conditions are met*: (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all coursework or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor, and (c) the student presents these reasons before the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average.

The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed one year. Should the student fail to meet all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has yet to be assigned within

one year, then the Incomplete will be changed to an F, or NC. If the course was initially taken under the CR/NC grading basis, this may adversely affect the student's academic standing.

Grade Appeal Policy

Disputes regarding grades must be initiated within sixty (60) days from the date of receiving the final course grade by filing a Grade Appeal Form with the instructor who assigned the grade. A grade appeal should be used when the student thinks the final course grade awarded does not reflect the grades earned on assessments or follow the grading scale as documented in the syllabus. The student should provide the rationale for the grade appeal and attach supporting document about the grades earned. The form should be sent via email to the faculty member who assigned the grade. The faculty member reviews the rationale and supporting documentation and completes the instruction section of the form. The instructor should return the form to the student, even if a grade change is made at this level. If the student is not satisfied with the decision, the student may appeal in writing to the Chairperson of the department from which the grade was issued. In situations where there is an allegation of capricious grading, discrimination, or unlawful actions, appeals may go beyond the Chairperson to the Dean or the Dean's designee of the college from which the grade was issued, with that decision being final. The Grade Appeal form is found in the Registrar's Form Library.

NOTE: The Grade Appeal Form is different from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA), the University of Texas at Tyler offers accommodations to students with learning, physical, and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler/ and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with the Assistant Director Student Accessibility and Resources/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at https://www.uttyler.edu/disability-services, the SAR office located in the Robert Muntz Library, LIB 460, email saroffice@uttyler.edu, or call 903.566.7079."

Military Affiliated Students

UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with your faculty member 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 faculty member aware of any complications as far in advance as possible. Your faculty member is willing to work with you and, if needed, put you in contact with university staff who are trained to assist you. The Military and Veterans Success Center (MVSC) has campus resources for military-affiliated students. The MVSC can be reached at MVSC@uttyler.edu or via phone at 903.565.5972.

Students on an F-1 Visa

To remain in compliance with Federal Regulations requirements you must do the following:

- Traditional face-to-face classes: Attend classes on the regular meeting days/times.

- Hybrid Classes: Attend all face-to-face classes convened by the instructor according to the schedule set for your specific course.
- Online course: Only one online course can count toward your full-time enrollment. Students are expected to be fully engaged and meet all requirements for the online course.

Academic Honesty and Academic Misconduct

The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the Student Conduct and Discipline policy in the Student Manual Of Operating Procedures (Section 8).

FERPA

UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in University Policy 5.2.3. The course instructor will follow all requirements to protect your confidential information.

Absence for Official University Events or Activities

This course follows the practices related to Excused Absences for University Events or Activities as noted in the Catalog.

Absence for Religious Holidays

This course follows the practices related to Excused Absences for Religious Holy Days as noted in the Catalog.

Absence for Pregnant Students

This course follows the requirements of Texas Laws SB 412, SB 459, SB 597/HB 1361 to meet the needs of pregnant and parenting students. Part of the supports afforded pregnant students includes excused absences. Faculty who are informed by a student of needing this support should make a referral to the Parenting Student Liaison. NOTE: Students must work with the Parenting Student Liaison in order to receive these supports. Students should reach out to the Parenting Student Liaison at parents@uttyler.edu and also complete the Pregnant and Parenting Self-Reporting Form.

Campus Carry

We respect the right and privacy of students who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus-carry/index.php.

Appendix: CEPH Competencies

CEPH Competencies
Evidence-based Approaches to Public Health
1. Apply epidemiological methods to settings and situations in public health practice.
2. Select quantitative and qualitative data collection methods appropriate for a given public health context.
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming, and software, as appropriate.
4. Interpret results of data analysis for public health research, policy, or practice.

Public Health and Health Care Systems
5. Compare the organization, structure, and function of health care, public health, and regulatory systems across national and international settings.
6. Discuss the means by which structural bias, social inequities, and racism undermine health and create challenges to achieving health equity at organizational, community and systemic levels.

Planning & Management to Promote Health
7. Assess population needs, assets, and capacities that affect communities' health.
8. Apply awareness of cultural values and practices to the design, implementation, or critique of public health policies or programs.
9. Design a population-based policy, program, project, or intervention.
10. Explain basic principles and tools of budget and resource management.
11. Select methods to evaluate public health programs.

Policy in Public Health
12. Discuss the policy-making process, including the roles of ethics and evidence.
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes.
14. Advocate for political, social, or economic policies and programs that will improve health in diverse populations.
15. Evaluate policies for their impact on public health and health equity.

Leadership
16. Apply leadership and/or management principles to address a relevant issue.

17. Apply negotiation and mediation skills to address organizational or community challenges.

Communication
18. Select communication strategies for different audiences and sectors.
19. Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation.
20. Describe the importance of cultural competence in communicating public health content.

Interprofessional and/or Intersectoral Practice
21. Integrate perspectives from other sectors and/or professions to promote and advance population health.

Systems Thinking
22. Apply a systems thinking tool to visually represent a public health issue in a format other than standard narrative.

UT Tyler MPH Program Competencies
1. Utilize community assessment and analysis tools to address factors that contribute to disparities in rural populations.
2. Develop a risk assessment and management plan relevant to PH programs and services.
3. Develop strategies for obtaining resources for PH programs, projects, and services.
4. Evaluate major environmental laws and their effects on environmental factors in health.
5. Examine occupation as a social determinant of health.