



## Course Syllabus

### MSHE 330 Biostatistics and Health Equity Research, Spring 2025

3 credits hours

#### Course Description

This course equips students with the advanced analytical skills necessary to navigate the intricate landscape of public health research, preparing them to make meaningful contributions to global health equity. It delves into sophisticated methods for organizing, managing, exploring, and deriving statistical inferences from multivariable data sets. Students will gain proficiency in a range of regression models, including simple and multiple linear regression, logistic regression, Poisson regression, and Cox proportional hazards models. The course extends beyond basic statistical techniques to cover advanced topics such as generalized linear models and product-limit (Kaplan-Meier) estimation, providing students with a robust toolkit for tackling complex public health challenges. Tailored for students pursuing an MS in Health Equity or a PhD in Global Health Equity, this course is designed to foster the development of critical research skills essential for future leaders and innovators in the field of public health. By the end of this course, students will be well-equipped to design, conduct, and interpret sophisticated research studies, positioning them at the forefront of efforts to address pressing public health issues and promote health equity on a global scale.

#### Course Learning Objectives

By the end of this course students will be able to:

1. **Master Advanced Statistical Techniques:** Students will develop proficiency in advanced statistical methods, including simple and multiple linear regression, logistic regression, Poisson regression, and Cox proportional hazards models, essential for public health research.
2. **Apply Statistical Software:** Students will gain hands-on experience using industry-standard statistical software package SPSS, to analyze complex, multivariable public health data sets in a computer laboratory setting.
3. **Analyze Survival Data:** Students will learn to apply advanced techniques such as generalized linear models and product-limit (Kaplan-Meier) estimation to analyze survival data and other time-to-event outcomes common in public health research.
4. **Conduct and Interpret Research:** Through homework assignments and practical applications, students will enhance their ability to design, conduct, and interpret sophisticated research studies relevant to global health equity.
5. **Develop Practical Skills:** Regular computer laboratory sessions will enable students to translate theoretical knowledge into actionable insights, fostering the development of practical skills essential for future leaders and innovators in public health.
6. **Promote Global Health Equity:** By the end of the course, students will be equipped to address pressing public health issues and promote health equity on a global scale, positioning them at the forefront of public health research and practice.

#### Instructor

Dr. Chau-Kuang (CK) Chen  
Professor, Department of Public Health, School of Global Health,  
Director of Institutional Research, Meharry Medical College  
Mobile Phone: (615) 885-6917  
Office Phone: (615) 327-6848  
Email: [ckchen@mmc.edu](mailto:ckchen@mmc.edu)

<b>Class Hours &amp; Location</b>	<b>Tuesday and Thursday</b> Class Hours: 6:00 pm – 7:30 pm CST Class Location: Online	
<b>Office Hours</b>	<b>Monday and Wednesday, 6:00 pm – 7:00 pm</b> (Online, Blackboard) or by appointment; Email, Phone Call Email: <a href="mailto:ckchen@mmc.edu">ckchen@mmc.edu</a> Cell Phone: (615) 8856917	
<b>Course Textbook</b>	 <p>Vittinghoff, E., Glidden, D. V., Shiboski, S. C., &amp; McCulloch, C. E. (2012). <i>Regression methods in biostatistics: linear, logistic, survival, and repeated measures models [2nd Edition]</i>. Springer Publishing.</p>	
<b>Class Format</b>	This course will be conducted as an online course that follows the schedule published in the syllabus. <b>Attendance is mandatory.</b> Online sessions will be a combination of lectures, discussions, and presentations from the instructor and students. Students are expected to have read all assigned readings and watched related videos prior to the class. All assigned readings and video watching will come from the textbook or be provided as supplemental resources.	

### Course Grading Policies

- Homework assignments (1 – 7): 21%
- Regular exams (1 – 3): 36%
- Final exam: 20%
- Posters (1 and 2): 20%
- Class participation: 3%

### Grading Scale

For this course, grades will be assigned as follows:

A = 90 – 100

B<sup>+</sup> = 87 – 89

B = 80 – 86



C = 70 – 79  
D = 60 - 69  
F < 60

### **Grade Expectations:**

Not all students can expect an A grade for this course! Being awarded an A indicates that the student has an excellent grasp of the various topics and has demonstrated an ability to apply them accurately, precisely, and with a clear understanding of their implications on the situation. Being awarded a B or B<sup>+</sup> indicates proficiency in applying the topics, but not as clear an appreciation of the subtleties of the topics. Being awarded a C indicates that the student has a limited understanding of the topics but has failed to apply them accurately or properly interpret their meaning. A D indicates that the student has very little grasp of the topics and has made a minimal effort in demonstrating an ability to apply them to solving problems. An F indicates that the student has not grasped the topics and has not demonstrated an ability to apply them to solving problems.

**NOTE: While group assignments will be submitted, individual grades will be assigned based on the student's individual contribution to the assignments.**

### **Blackboard Ultra**

Blackboard Ultra will be used extensively for assignments, announcements, and communication throughout the semester. Blackboard Ultra is accessible at <https://blackboard.mmc.edu/>.

### **Course Policies**

#### **1. Class Attendance**

Attendance will be taken every class period. In accordance with the School of Global Health Academic Policies and Procedures Manual for Graduate Programs at Meharry Medical College, unexcused absences in excess of 20% of the scheduled classes may result in a failure in the course. A Dean's excuse may be granted for personal illness and death of a close relative. If a Dean's excuse is granted, the student will not be penalized for work missed during their absence from class, although make-up work may be required. Flagrant misuse of the attendance policy (excused or unexcused) may result in a course grade penalty per the instructor's discretion. Students are expected to arrive on time for class and to stay the entire class length. Habitual tardiness and/or early departures from class may result in point deductions. For virtual class meetings, a video presence is preferred to document attendance.

Each course week will span from Monday through the following Sunday. Students will be responsible for completing all graded participation exercises by 11:59 pm Central Time on Sunday. Graded assignments that are submitted late will have five points deducted per day.

#### **2. In-person and Virtual Classroom Behavior**

Disruptive and disorderly behavior will not be tolerated in class. Disciplinary actions will be taken if warranted.

#### **3. Cellular Phones, Pagers, PDAs, Laptops, Tablet PCs, Smartwatches, etc.**



These devices must be silenced during class time. These devices can be used during class breaks. Students should refrain from using electronic devices during class time for non-course-related activities.

**4. Eating in Class**

Food should not be brought to class. There will be no eating or drinking food in class.

**5. Late Work Assignments**

Work assignment is due by 12 noon of the due date. It must be submitted via email (ckchen@mmc.edu).

A penalty of 20% will be applied to work assignment/exam that is submitted up to 24 hours late.

A penalty of 30% will be applied to work assignment/exam that is submitted up to 48 hours late.

A penalty of 40% will be applied to work assignment/exam that is submitted up to 72 hours late.

No credit will be given for work assignment/exam that is submitted more than 72 hours after it is due.

**COURSE POLICIES: Academic Integrity and Professional Conduct**

**1. Late Submission**

Late submission of assignments will **not** be accepted unless by prior arrangement and permission from the instructor. No extra credit work to improve grades will be allowed.

**2. Academic Honesty**

As documented by The Graduate Student Academic Policies and Procedures Manual for Graduate Programs at Meharry Medical College, all students are subject to the regulations of the College's Honor Code. Instances of suspected plagiarism, cheating on examinations, or other violations of the student Honor Code, will be reported to the appropriate Meharry Medical College Administrative offices. Plagiarism consists of presenting the writing, data, or ideas of another as one's own without acknowledgement by citation or other appropriate and accepted means. Plagiarism also involves submitting your own work toward requirements in more than one course without prior approval from the instructor. Plagiarism constitutes a grave and fundamental violation of personal integrity and professional ethics. Appropriate penalties for plagiarism may include assigning an automatic C or F grade in a course and/or dismissal from the School of Global Health.

**3. Examination Dishonesty**

Cheating on examinations, homework assignments, assigned papers, and other course activities represents unacceptable behavior. Examples of examination dishonesty include, but are not limited to: copying material from another student's examination; permitting a student to copy from an examination; use of unauthorized books or notes; utilization of all electronic devices (e.g., cellular phones, google glasses, laptops, iPads, smart watches, etc.) and media; falsification/misrepresentation of academic performance; impersonation of another student at any examination or other form of academic work; interference with an instructor's administration of an examination. Examination questions written by Meharry faculty are not to be copied, photographed, etc., and/or memorized with the intent to distribute or post on any website. If dishonesty is detected, the student will receive an automatic zero on that examination, quiz, or work assignment. Repeated (second or other instances of dishonesty)



behavior will be referred to the School Disciplinary Committee and may result in expulsion from the Program and Meharry Medical College.

### **ADA Policy**

Meharry Medical College is committed to the provisions of the Rehabilitation Act of 1973 and the Americans with Disabilities Act in creating an inclusive community for students with disabilities. Students seeking accommodations for any type of disability are encouraged to contact the ADA Coordinator. Services include, but are not limited to, extended time for testing, assistance with locating sign language interpreters, audiotaped textbooks, physical adaptations, note-takers, and reading services. Accommodations are tailored to meet the needs of each student with a documented disability. Specific concerns pertaining to services for people with disabilities or any disability issue should be directed to the ADA Coordinator.

### **ADA Contact**

Maleek Mitchell, MS  
Educational Skills and ADA Specialist  
Center for Academic Success and Achievement (CASA)  
Email: [maleek.mitchell@mmc.edu](mailto:maleek.mitchell@mmc.edu)  
Telephone: (615) 327-6500








<https://home.mmc.edu/student-affairs/student-life/student-insurance/students-with-disabilities/>








## **MSHE 330: Biostatistics and Health Equity Research Spring 2025**








### ***Tentative Semester Schedule***

**This schedule may change as the semester progresses, per the instructor's discretion.**





Date	Topic	Readings	Tasks
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<p>Jan 7 &amp; 9</p> 	<ul style="list-style-type: none"> <li>Introduction to Biostatistics and Health Equity Research</li> </ul>	<p><b>Chapter 1</b></p> <p>Biostatistics and health equity research course syllabus by Dr. CK Chen  <a href="https://notebooklm.google.com/notebook/ae5613d6-0686-4982-aca2-a9f6a4e3ab20/audio">https://notebooklm.google.com/notebook/ae5613d6-0686-4982-aca2-a9f6a4e3ab20/audio</a></p> <p>Descriptive Statistics by Dr. CK Chen  <a href="https://youtu.be/ToEz3bRoOOY">https://youtu.be/ToEz3bRoOOY</a></p> <div style="text-align: center;">         Beautiful.ai - Introduction to Biosta     </div> <div style="text-align: center;">         Beautiful.ai - Descriptives Part I.pdf     </div> <div style="text-align: center;">         Beautiful.ai - Descriptives Part II.pd     </div> <div style="text-align: center;">         Beautiful.ai - The Importance of Statisti     </div> <div style="text-align: center;">         Beautiful.ai - Sensitivity and Specifi     </div> <div style="text-align: center;">         Beautiful.ai - Discrete vs. Continuous Variab     </div>	<p><b>Basic statistical concepts review:</b> Measures of central tendency, variability, and distribution shapes</p> <p><b>Introduction to health equity research:</b> Defining health disparities and the role of biostatistics in addressing them</p> <p><b>Assignment:</b> Personal reflection on the importance of biostatistics in health equity research</p>
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<p>Jan 14 &amp; 16</p> 	<ul style="list-style-type: none"> <li>Data Management and Exploratory Data Analysis</li> <li><b>Homework Assignment-1 Submission</b></li> </ul>	<p><b>Chapter 2</b></p> <p>The power of probability theory in solving complex real-world challenges by Dr. CK Chen  <a href="https://youtu.be/cEXyAbSs4lc">https://youtu.be/cEXyAbSs4lc</a></p> <p>The role and importance of sampling distributions in biostatistics by Dr. CK Chen  <a href="https://youtu.be/jP8D7aPf3kc">https://youtu.be/jP8D7aPf3kc</a></p> <div style="text-align: center;">         Beautiful.ai - The Importance of Probat     </div> <div style="text-align: center;">         Beautiful.ai - Sampling Distribution     </div> <div style="text-align: center;">         Interval Estimation Presentation AI.pdf     </div> <div style="text-align: center;">         Independent t-test AI.pdf     </div> <div style="text-align: center;">         Beautiful.ai - The Paired t-test.pdf     </div> <div style="text-align: center;">         Beautiful.ai - Chi-Square Test Part I     </div>	<p><b>Introduction to SPSS:</b> Basic interface, data import/export, and variable management</p> <p><b>Data cleaning and preparation:</b> Handling missing data, outliers, and data transformation</p> <p><b>Descriptive statistics:</b> Calculating and interpreting means, medians, standard deviations, and percentiles</p> <p><b>Graphical representations:</b> Creating and interpreting histograms, box plots, and scatter plots</p> <p><b>Lab:</b> Hands-on session with sample health equity datasets</p>
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<p>Week 3</p>	<p>Jan 21 &amp; 23</p> 	<ul style="list-style-type: none"> <li>Simple Linear Regression</li> <li><b>Homework Assignment-2 Submission</b></li> </ul>	<p><b>Chapter 3.3</b></p> <p>Understanding Linear Regression Basic by Dr. CK Chen  <a href="https://youtu.be/11dCzV2OzSk">https://youtu.be/11dCzV2OzSk</a></p> <p>Key Assumptions of Linear Regression by Dr. CK Chen  <a href="https://youtu.be/Pe5jFSh9VAQ">https://youtu.be/Pe5jFSh9VAQ</a></p> <p> Beautiful.ai - Correlation Analysis A</p> <p> Beautiful.ai - A Guide to Simple Linear Regr</p> <p> Beautiful.ai - Linear Regression Analysis P</p> <p> Beautiful.ai - Linear Regression Analysis a</p>	<p><b>Correlation vs. causation:</b> Understanding the relationship between variables</p> <p><b>Simple linear regression model:</b> Assumptions, equations, and interpretations</p> <p><b>Least squares method:</b> Calculating and interpreting regression coefficients</p> <p><b>Model diagnostics:</b> Residual analysis and goodness-of-fit measures</p> <p><b>Case study:</b> Applying simple linear regression to a health equity problem</p> <p><b>Assignment:</b> Conduct and interpret a simple linear regression analysis using provided data</p>
<p>Week 4</p>	<p>Jan 28 &amp; 30</p> 	<ul style="list-style-type: none"> <li>Multiple Linear Regression</li> <li><b>Homework Assignment-3 Submission</b></li> </ul>	<p><b>Chapter 4.2</b></p> <p>Multiple Linear Regression Analysis by Dr. CK Chen  <a href="https://youtu.be/kqyceyKu7Jg">https://youtu.be/kqyceyKu7Jg</a></p> <p>The USLME Step 1 Prediction Model by Dr. CK Chen  <a href="https://youtu.be/fYBISzmnuC8">https://youtu.be/fYBISzmnuC8</a></p> <p> Beautiful.ai - Multiple Linear Regre</p>	<p><b>Extension from simple to multiple regression:</b> Understanding multivariate relationships</p> <p><b>Model building and variable selection:</b> Stepwise, forward, and backward selection methods</p> <p><b>Multicollinearity:</b> Detecting and addressing correlated predictors</p> <p><b>Interactions and polynomial terms:</b> When and how to include them</p> <p><b>Interpreting multiple regression results</b> in the context of health equity</p> <p><b>Lab:</b> Multiple regression analysis using SPSS</p>



<p>Feb 4 &amp; 6</p> 	<ul style="list-style-type: none"> <li>▪ <b>First Exam</b></li> <li>▪ Binary Logistic Regression</li> <li>▪ Ordered Logistic Regression</li> <li>▪ Multinomial Logistic Regression</li> </ul>	<p><b>Chapters 1-4</b></p> <p><b>Chapter 5</b></p> <p>Logistic Regression Model by Dr. CK Chen  <a href="https://youtu.be/X3RqlzBwPLs">https://youtu.be/X3RqlzBwPLs</a></p> <p>Decoding Student Satisfaction- An Ordinal Regression by Dr. CK Chen  <a href="https://youtu.be/Q4mVctO9Wd0">https://youtu.be/Q4mVctO9Wd0</a></p> <p>        Beautiful.ai - Logistic Regression A Powerfu</p> <p>        Beautiful.ai - Ordinal Regression Predicting</p> <p>        Beautiful.ai - Multinomial Logistic F</p>	<p><b>Comprehensive midterm exam</b> covering weeks 1-4</p> <p><b>Review session:</b> Discussion of exam questions and clarification of concepts</p> <p><b>Familiar with Logistic regression:</b> Understanding binary measurement of the outcome variable</p> <p><b>Model building and variable selection:</b> Stepwise, forward, and backward selection methods</p> <p><b>Multicollinearity:</b> Detecting and addressing correlated predictors</p> <p><b>Interactions and polynomial terms:</b> When and how to include them</p> <p><b>Interpreting logistic regression</b> results in the context of health equity</p>
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<p><b>Feb 11 &amp; 13</b></p> <p></p> <p>Week 6</p>	<ul style="list-style-type: none"> <li>Partial Least Squares (PLS) Regression</li> <li>Artificial Neural Network (ANN) Model</li> <li><b>Homework Assignment-4 Submission</b></li> </ul>	<p><b>Chapter 8</b></p> <p>Exploring PLS Regression Analysis by Dr. CK Chen  <a href="https://youtu.be/7SLKB2HI2ic">https://youtu.be/7SLKB2HI2ic</a></p> <p>Curriculum Assessment ANN and SVM by Dr. CK Chen  <a href="https://youtu.be/JFyJ9GybagE">https://youtu.be/JFyJ9GybagE</a></p> <p>Building machine learning models by Dr. CK Chen  <a href="https://youtu.be/gKwPRaYNzjI">https://youtu.be/gKwPRaYNzjI</a></p> <p>Understanding Machine Learning Models by Dr. CK Chen  <a href="https://youtu.be/WVcd5bTBS38">https://youtu.be/WVcd5bTBS38</a></p> <p>        Beautiful.ai - Modeling Count Data</p> <p>        Beautiful.ai - Poission Regression for MPH C</p>	<p>Clean, scale data and handle missing values/outliers</p> <p>Split into training/test sets</p> <p>Fit data to model, examine loadings, and check VIP scores for evaluating importance</p>
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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Week 7</p> <p>Feb 18 &amp;20</p> 	<ul style="list-style-type: none"> <li>Kaplan-Meier Estimation</li> <li>Cox Proportional Hazards Regression</li> </ul>	<p><b>Chapter 6</b></p> <p>Survival Analysis by CK Chen  <a href="https://youtu.be/r5U8OrkueRk">https://youtu.be/r5U8OrkueRk</a></p> <p>Understanding Cox Regression Basics by Dr. CK Chen  <a href="https://youtu.be/8lh1JW11DiE">https://youtu.be/8lh1JW11DiE</a></p> <p>        Beautiful.ai - The Kaplan-Meier estimat</p> <p>        Beautiful.ai - Cox Regression Exploring</p> <p>        Beautiful.ai - Analyzing Student Le</p> <p>        Beautiful.ai - The Cox Proportional Hazards</p> <p>        Beautiful.ai - The Cox Proportional Hazards</p>	<p><b>Survival analysis basics:</b> Censoring, survival functions, and hazard rates</p> <p><b>Cox proportional hazards model:</b> Assumptions, equations, and interpretations</p> <p><b>Hazard ratios:</b> Calculation and interpretation in health equity research</p> <p><b>Model diagnostics:</b> Testing the proportional hazards assumption</p> <p><b>Case study:</b> Analyzing survival disparities in a health equity context</p> <p><b>Assignment:</b> Conduct and interpret a Cox regression analysis</p>
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**MSHP 210-01 & SGHC 504-01: Political Determinants of Health**  
**Spring 2025**





***Tentative Semester Schedule***




**This schedule may change as the semester progresses, per the instructor's discretion.**

Date	Topic	Readings	Tasks
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<b>Week 8</b>	<p>Feb 25 &amp; 27</p> 	<ul style="list-style-type: none"> <li>Kaplan-Meier Estimation</li> <li><b>Poster-1 Presentation</b></li> </ul>	<p><b>Chapter 3.52 – 3.53</b></p>	<p><b>Non-parametric survival analysis:</b> Kaplan-Meier method basics</p> <p><b>Survival curves:</b> Construction, interpretation, and comparison</p> <p><b>Log-rank test:</b> Comparing survival between groups</p> <p><b>Median survival time and other percentiles:</b> Calculation and interpretation</p> <p><b>Case study:</b> Analyzing disparities in time-to-event outcomes</p> <p><b>Assignment:</b> Conduct and interpret a Kaplan-Meier analysis with log-rank test</p>
<b>Week 9</b>	<p>Mar 4 &amp; 6</p> 	<ul style="list-style-type: none"> <li>Generalized Linear Models</li> <li><b>Homework Assignment-5 Submission</b></li> </ul>	<p><b>Chapter 8</b></p> <p>GLM with Logit Link for COVID 19 Vaccine Acceptance Among Healthcare Workers by D. CK Chen  <a href="https://youtu.be/iKcT8s8vAMc">https://youtu.be/iKcT8s8vAMc</a></p> <p>A longitudinal cardiovascular study conducted at the Mayo Clinic's Center for Clinical Research reported by Dr. CK Chen  <a href="https://youtu.be/1dw9SRj2adQ">https://youtu.be/1dw9SRj2adQ</a></p>	<p><b>Framework of generalized linear models:</b> Linking various regression techniques</p> <p><b>Link functions:</b> Understanding and selecting appropriate links</p> <p><b>Model selection criteria:</b> AIC, BIC, and their interpretation</p> <p><b>Diagnostics for generalized linear models:</b> Residual analysis and influence measures</p> <p><b>Application:</b> Comparing different GLMs in health equity research</p> <p><b>Lab:</b> Fitting and comparing different GLMs using SPSS</p>
<b>Week 10</b>	<p>Mar 11 &amp; 13</p> 	<ul style="list-style-type: none"> <li><b>Second Exam</b></li> </ul>	<p><b>Chapters 3.52, 3.53, 6, and 8</b></p>	<p><b>Comprehensive midterm exam</b> covering weeks 5-10</p> <p><b>Review session:</b> Discussion of exam questions and clarification of concepts</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Week 11</p>	<p><b>Mar 18 &amp; 20</b></p> 	<ul style="list-style-type: none"> <li>Rasch Model, Item Response Theory, and Winsteps</li> <li><b>Homework Assignment-6 Submission</b></li> </ul>	<p><b>Chapter 7</b></p> <p>Rasch model in healthcare for PROMs by Dr. CK Chen  <a href="https://youtu.be/YtYxfQvvRek">https://youtu.be/YtYxfQvvRek</a></p> <p>Revolutionizing Healthcare IRT &amp; Rasch Model for Healthcare by Dr. CK Chen  <a href="https://youtu.be/4O5msx-A4x8">https://youtu.be/4O5msx-A4x8</a></p> <p>Unveiling Racial Disparities in COVID-19: Insights from Nashville by Dr. CK Chen  <a href="https://youtu.be/eDIneLtwcY0">https://youtu.be/eDIneLtwcY0</a></p> <p>Evaluating the Construct Validity of Basic Science Curriculum Assessment Instrument by Dr. CK Chen  <a href="https://youtu.be/CE7NBF9FuzY">https://youtu.be/CE7NBF9FuzY</a></p> <p>        Beautiful.ai - The Rasch Model Reliability</p> <p>        Beautiful.ai - The Rasch Model in Public Health</p> <p>        Beautiful.ai - The Rasch Model and Objectivity</p> <p>        Beautiful.ai - Improving Infant Mortality</p>	<p><b>Item Fit Analysis:</b></p> <p>Check INFIT and OUTFIT statistics (mean squares)</p> <p>Acceptable range typically 0.5 to 1.5</p> <p>Look for outliers through standardized residuals</p> <p>Examine Item Characteristic Curves (ICCs)</p> <p><b>Dimensionality Assessment:</b></p> <p>Conduct Principal Component Analysis of residuals</p> <p>Check for local independence</p> <p>Evaluate eigenvalues</p> <p>Assess variance explained by measures</p>
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<div>Week 12</div>	<div>Mar 25 &amp; 27</div> <div></div>	<ul style="list-style-type: none"> <li>Statistical Power and Sample Size Calculation</li> <li><b>Homework Assignment-7 Submission</b></li> </ul>	<p><b>Chapter 5.7</b></p> <p><a href="#">Sample Size and Effective Sample Size, Clearly Explained!!!</a> by StatQuest with Josh Starmer.</p> <p><a href="#">Sample size Calculation</a> by CONNECTING ASIA TV. <a href="#">Oneway ANOVA - SPSS (part 1)</a> by how2stats</p> <div>         Beautiful.ai - The Power of Linear Regre     </div> <div>         Beautiful.ai - The Power of Correlation ,     </div>	<p><b>Importance of power analysis</b> in study design</p> <p><b>Power calculation for different study designs:</b> t-tests, ANOVA, regression, survival analysis</p> <p><b>Using G*Power software:</b> Hands-on practice with various scenarios</p> <p><b>Sample size</b> determination for health equity studies</p> <p><b>Ethical considerations</b> in sample size planning</p> <p><b>Assignment:</b> Conduct power analyses for different study designs</p>
<div>Week 13</div>	<div>Apr 1 &amp; 3</div> <div></div>	<ul style="list-style-type: none"> <li><b>Third Exam</b></li> <li>Applying Statistics to Health Equity Research</li> </ul>	<p><b>Chapters 5 and 7</b></p> <p><b>Chapter 12</b></p>	<p><b>Case studies:</b> In-depth analysis of published health equity research</p> <p><b>Critique of statistical</b> methods used in health disparities literature</p> <p><b>Interpreting results</b> in the context of health disparities and social determinants of health</p> <p><b>Challenges in health equity research:</b> Discussing methodological issues</p> <p><b>Group activity:</b> Developing a statistical analysis plan for a health equity research question</p>

Week 14	Apr 8 & 10 	<ul style="list-style-type: none"> <li>Ethics in Biostatistics and Health Equity Research</li> </ul>	<b>Chapter 13</b>  Ethics in Biostatistics and Health Equity Research by Dr. CK Chen <a href="https://youtu.be/3iP40-rjTBI">https://youtu.be/3iP40-rjTBI</a>	<b>Responsible conduct of research:</b> Data integrity, privacy, and confidentiality  <b>Bias in health disparities research:</b> Types, detection, and mitigation strategies  <b>Confounding:</b> Identification and control in observational studies  <b>Ethical reporting of results:</b> Avoiding misrepresentation and overgeneralization  <b>Discussion:</b> Ethical dilemmas in health equity research  <b>Assignment:</b> Ethical analysis of a published health equity study designs
Week 15	Apr 15 & 17 	<ul style="list-style-type: none"> <li><b>Poster-2 Presentation</b></li> </ul>	TBA	Student presentations of research poster  Peer feedback and instructor evaluation  Discussion of real-world applications and implications of presented research
Week 16	Apr 22 & 24 	<ul style="list-style-type: none"> <li><b>Final Exam</b></li> <li>Course Wrap-up and Future Directions</li> </ul>	<b>Chapters 1 – 13</b>  TBA	<b>Comprehensive midterm exam</b> covering weeks 1-13  Review of key concepts and their integration in health equity research  Discussion of emerging trends in biostatistics and health equity research  Career paths in biostatistics and health equity research  Course evaluation and feedback  Final thoughts and closing remarks

### SAMPLE OF COVER PAGE TO BE USED FOR ALL INDIVIDUAL ASSIGNMENTS

Below is a blank certification of authorship cover page. This would precede all individual assignments submitted for grading:

**Meharry Medical College**  
**School of Global Health**



**Assignment for Course:**

**Submitted to:**

**Submitted by:**

**Date of Submission:**

**Title of Assignment:**

**CERTIFICATION OF AUTHORSHIP:**

**I certify that I am the author of this paper and that any assistance I received in its preparation is fully acknowledged and disclosed in the paper. I have also cited any sources from which I used data, ideas or words, whether quoted directly or paraphrased. I also certify that this paper was prepared by me specifically for this course.**

**Student Signature:**

\*\*\*\*\*

**Instructor's Grade on Assignment:**

**Instructor's Comments:**





## **SAMPLE OF COVER PAGE TO BE USED FOR ALL GROUP ASSIGNMENTS**

Below is a blank certification of authorship cover page. This would precede all individual assignments submitted for grading:

**Meharry Medical College  
School of Global Health**

**Assignment for Course:** (Course number and title)

**Submitted to:** (Professor's name)

**Submitted by:** List your name here if you prepared this assignment  
(Students name) (Student's ID number)

**Date of Submission:**

**Title of Assignment:**

**CERTIFICATION OF AUTHORSHIP:** We certify that we are the authors of this paper and that any assistance we received in its preparation is fully acknowledge and disclosed in the paper. We have also cited any sources from which we used data, ideas of words, whether quoted directly or paraphrased. We also certify that this paper was prepared by us specifically for this course.

**Students Signatures:** Sign here electronically if you prepared this assignment

\_\_\_\_\_, \_\_\_\_\_  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
\_\_\_\_\_, \_\_\_\_\_

\*\*\*\*\*

**Instructor's Grade on Assignment:**

**Instructor's Comments:**



## **MMC-SGH Policy Guidelines: Responsible and Ethical Use of AI in the Classroom**

### **Draft Policy on Ethical and Responsible Use of Generative AI in the Classroom**

#### **1. Introduction**

**Meharry Medical College School of Global Health (MMC-SGH)** is dedicated to creating a learning environment that leverages technological advancements while upholding the highest ethical standards. This policy outlines the ethical and responsible use of generative Artificial Intelligence (AI) in educational activities to enhance learning experiences without compromising academic integrity, privacy, or equity. For comprehensive guidelines on Academic Honesty at MMC, please refer to: [MMC Academic Honesty Guidelines](#).

The general MMC Academic Honesty guidelines provide a baseline for understanding academic integrity in the creation and submission of academic work and detail the consequences of violating these standards. The guidelines below specifically address the ethical principles of: 1) academic integrity; 2) privacy; and 3) equity and inclusion.

#### **2. Scope**

This policy applies to all students, faculty, and staff at MMC-SGH involved in the use of generative AI tools within the classroom and related educational activities. This includes but is not limited to assignments, assessments, research, and classroom discussions.

#### **3. Definitions**

**Generative AI:** AI systems that can generate text, images, audio, or other media based on input data or prompts (e.g., OpenAI ChatGPT, Google Gemini, MS Co-Pilot).

**Ethical Use:** Utilization of generative AI in a manner that is consistent with ethical standards, including honesty, fairness, and respect for all individuals.

**Responsible Use:** Application of generative AI in ways that support educational objectives while minimizing risks of misuse or harm.

**Hallucinations:** AI hallucinations refer to instances where generative AI produces content that appears plausible but is factually incorrect or nonsensical. This can occur due to the inherent limitations and training data of the AI model.



## 4. Ethical Principles

### 4.1 Academic Integrity

**Honesty:** Generative AI should not be used to fabricate or falsify academic work. All contributions from AI must be appropriately acknowledged and transparent.

**Originality:** Students must ensure that their work remains their own and that AI-generated content does not constitute plagiarism.

**Transparency:** Clear disclosure of any AI assistance used in assignments or assessments is required.

### 4.2 Privacy

**Confidentiality:** Users must ensure that personal or sensitive information is not disclosed to AI systems.

**Data Security:** AI tools should be used in a manner that protects the privacy and security of data, adhering to university data protection policies.

### 4.3 Equity and Inclusivity

**Bias Mitigation:** Users should be aware of potential biases in AI-generated content and take steps to mitigate their impact.

**Accessibility:** If AI tools are allowed for assignments, ensure that AI tools are accessible to all students, including those with disabilities.

## 5. Guidelines for Use

### 5.1 Policies for the Use of AI in Courses: Setting Clear Expectations for Students

To uphold academic integrity and foster responsible AI usage, Meharry Medical College School of Global Health requires all instructors to include a policy in their course syllabi regarding the use and misuse of generative AI tools. This ensures clear expectations for the appropriate interaction with AI and aligns with MMC's commitment to ethical standards. These policies offer different levels of flexibility regarding AI usage, allowing for tailored application based on the course's objectives and ethical considerations.

### 5.2 Maximally Restrictive Policy

All work submitted for this course must be entirely the student's own. In cases of group work, the assignment must list all team members who contributed. The use of generative AI tools such as ChatGPT or any similar technology is strictly prohibited at all stages of the work, including preliminary drafts. Violations of this policy will be treated as academic misconduct. Please be aware that different courses may implement varying AI policies, and it is the student's responsibility to adhere to the policy

for each specific course. **Exceptions to this policy may be allowed only in rare circumstances and must be explicitly approved by the professor.**

## **6. Accountability and Managing AI Hallucinations**

### **6.1 Understanding AI Hallucinations**

Generative AI tools can sometimes produce information that is inaccurate, misleading, or entirely fabricated. These inaccuracies, known as “hallucinations,” can compromise the quality and reliability of your work. It is crucial for students to be aware of this potential issue and take proactive steps to verify the information provided by AI tools. AI hallucinations refer to instances where generative AI produces content that appears plausible but is factually incorrect or nonsensical. This can occur due to the inherent limitations and training data of the AI model.

### **6.2 Accountability for Fact-Checking**

Students are responsible for thoroughly fact-checking any AI-generated content included in their submissions. This includes cross-referencing AI outputs with reliable sources to ensure accuracy. It is essential to critically evaluate the relevance and correctness of the information provided by AI tools.

### **6.3 Consequences of Submitting Inaccurate Information**

Students will be held accountable for any factual errors in their submissions, regardless of whether these errors originated from AI-generated content. Submitting inaccurate information as a result of relying on AI tools without proper verification will be treated as academic misconduct and may result in penalties.

### **6.4 Best Practices for Using AI Tools**

- Always cross-verify AI-generated content with trusted sources.
- Use AI tools as a supplementary resource, not a primary source of information.
- Clearly document and cite all AI-generated content according to APA standards.
- Maintain a critical mindset and question the validity of AI outputs.

By adhering to these guidelines, students can effectively utilize AI tools while maintaining the integrity and accuracy of their academic work.

## **7. How to Cite Generative AI**

Following APA style guidelines, below is an example of how to cite output from a gen-AI tool. The example below will use ChatGPT for illustrative purposes, but this guideline can be used for any gen-AI tool.

When quoting or reproducing text generated by gen-AI in your paper, describe its use in the Method section or a comparable section. For literature reviews or essays, include this description in the introduction. Provide the prompt used and the relevant text generated.



Since ChatGPT's outputs are not retrievable, they should be credited as algorithmic outputs rather than personal communications. This involves creating a reference list entry and corresponding in-text citation.

**Example In-Text Citation:**

When prompted with “Is the left brain right brain divide real or a metaphor?” the ChatGPT-generated text indicated that although the two brain hemispheres are somewhat specialized, “the notion that people can be characterized as ‘left-brained’ or ‘right-brained’ is considered to be an oversimplification and a popular myth” (OpenAI, 2023).

**Example Reference List Entry:**

OpenAI. (2023). ChatGPT (Mar 14 version) [Large language model]. <https://chat.openai.com/chat>

You may include long responses in an appendix or online supplemental materials, ensuring they are called out in the paper.

**Example:**

When given a follow-up prompt of “What is a more accurate representation?” the ChatGPT-generated text indicated that “different brain regions work together to support various cognitive processes” and “the functional specialization of different regions can change in response to experience and environmental factors” (OpenAI, 2023; see Appendix A for the full transcript).

**Creating a Reference:**

Follow the APA reference template for software:

- Author: OpenAI
- Date: Year of the version used
- Title: ChatGPT (Version) [Large language model]
- Source: URL

**Example:**

OpenAI. (2023). ChatGPT (Mar 14 version) [Large language model]. <https://chat.openai.com/chat>

- Parenthetical citation: (OpenAI, 2023)
- Narrative citation: OpenAI (2023)

Adapt this format for other AI models as needed.