WESTERN KENTUCKY UNIVERSITY
DEPARTMENT OF PUBLIC HEALTH
Biostatistics in the Health Sciences
PH 383-M70
Summer 2020

This is a web course and will be conducted entirely on Blackboard

Blackboard: This course will use Blackboard online course management system, which can be accessed at http://ecourses.wku.edu or by clicking Blackboard at http://www.wku.edu. Students are encouraged to complete IT: Blackboard Student User Training to familiarize themselves with all links (assignments, lecture notes, exams, grade, feedback and so on) before accessing course materials.

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Course Description
This course will introduce some concepts, principles and methods of statistics to students in the health field. The course will emphasize understanding and application of statistical concepts rather than mathematical techniques or procedures, though some computation remains essential. Basic statistical techniques of producing data, describing data both graphically and mathematically, and drawing inference from sample data will be introduced.

Prerequisite
3 hours of Math (Math 109 or 115 or higher)

Course Objectives
By the end of the course students should be able to:
1. Describe and present data appropriately
2. Compute and interpret basic statistics appropriately
3. Be familiar with descriptive and inferential statistics
4. Form and test hypotheses

Class Participation
Class attendance and participation is expected in the form of Blackboard log on, assignments and exams completion. Lack of participation will be considered an absence for that week and will result in a 10 point deduction from the student's overall point total.

ADA Policy:
In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-

745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu. Please do not request accommodations directly from the professor or instructor without a Faculty Notification Letter (FNL) from The Student Accessibility Resource Center.

Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) at https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf

Discrimination and Harassment Policy (#0.2040) at https://wku.edu/policies/hr_policies/2040_discrimination_harassment_policy.pdf.

Class Policies

1. **All class correspondence will be done via your official WKU e-mail and Blackboard. Students will be required to watch Blackboard online tutorials under (IT Training) before accessing course materials.**
2. You will need access to a computer with an internet connection. **Students should also check "Browser Compatibility" on Blackboard before accessing course materials.**
3. **Technology problems are not an excuse for a late assignment.** If you experience computer or e-mail problems and cannot submit your assignment, it is your responsibility to contact me through email or the Help Desk at (270-745-7000). This needs to be done before the assignment is due. Do not wait until the last minute to submit your assignment or take online test/exam. If you experience problems with Blackboard, call the Help desk at (270-745-7000). Since this class offers you the flexibility of working at your leisure, plan ahead. Expect to spend just as much time for an online class as you would for a face-to-face class. If you are unfamiliar with the technology used, check IT Training on Blackboard (Blackboard Student User Training**)** for training and assistance.
4. Back-up all of your files and the course work you submit to avoid unexpected errors.
5. Submit all your assignments using 12-point font in a "doc", "docx" or pdf file.
6. **Submit all assignments via Blackboard. No assignment should be submitted through the instructor's e-mail.** All submissions are due by **Central Daylight Time** on the day they are due. **Late assignments will not be accepted!!**

Course Requirements

1. Exercises

Exercises will be given periodically. Students are required to submit exercises by **each due date. Late assignments will not be accepted.**

2. Examinations

Three exams will be given. Material covered in the exam will come from class lectures and discussions, textbook and other exercises. Exams will include multiple choice and application questions. **It is the student's responsibility to contact the instructor prior to the test either by e-mail or telephone if he/she will miss a scheduled exam. Make-up exams will be given only with appropriate documented medical/emergency excuses.**

Method of Evaluation

Assignment	50 points
First exam	100 points
Second exam	100 points
Final exam	100 points
Total	**350 points**

Grading

A = 315-350
B = 280-314
C = 245-279
D = 210-244
F ≤ 209

The instructor reserves the right to alter the grading scale based on the class performance.

Course Outline

Topic

1. Introduction
   - Statistics
   - Observation
   - Variable
   - Data
   - Descriptive Statistics
   - Inferential Statistics
   - Measurement Scales

2. Study Designs
   Observational Study Designs
   - Case report/case series
   - Cross-sectional surveys
   - Cohort study
   - Case-control study

   Randomized Study designs
   - Randomized controlled trial/clinical trial
   - Crossover trial

3. Sample and Population

4. Descriptive Statistics
   - Summarizing data
     - Frequency table
   - Picturing data
     - Histograms
     - Frequency polygons
     - Bar chart
     - Pie chart
     - Stem and leaf plots

- Box plot
- Line graph

5. Descriptive Statistics
   - Measures of central tendency
   - Measures of variation

First Exam: May 22

7. The Normal Distribution
   - Characteristics of the normal curve
   - Z-scores
   - Computing areas under the normal curve

8. Inferential Statistics
   - Central limit theorem
   - Standard error of the mean
   - t-test

9. Inferential Statistics – Test of significance
   - Hypothesis testing
   - One and two-tailed test
   - Single sample
   - Sensitivity and Specificity

Second Exam: May 29

10. Inferential Statistics – Estimation
    - Point estimate and confidence intervals
    - One sample confidence intervals
    - Determination of sample size
    - Relationship between CI and significance test

11. Chi-square test
    - Test of association between two variables
    - Two-by-two contingency tables
    - Test of goodness of fit
    - McNemar's test

13. Measures of Strength of Association
    - Relative Risk
    - Odds Ratio

Final Exam: June 5