UNIVERSITY OF NORTHERN COLORADO

Extended Campus

College of Natural & Health Sciences
School of Mathematical Sciences

UNC Dual Enrollment at Brush High School

STAT150-654: Introduction to Statistical Analysis (3 credits)
Fall 2020 & Spring 2021

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Office Hours: 1:00 – 3:00 daily, before and after school by appointment

Prerequisite For UNC Dual Enrollment:

- Junior or Senior status
- 3.0 cumulative GPA
- Grade of "C" or better in Algebra 2. A grade of C- is not acceptable
- Counselor/Instructor approval prior to taking the course
- Parent consent
- Special Exemptions to these qualifications may be made on an individual basis through written request to UNC Extended Campus

Course Description: Study techniques used in organizing data, including frequency distributions, histograms, measures of central tendency, measures of dispersion, probability distributions, point estimation, interval estimation and testing hypotheses.

Required Materials:

- Textbook: *Elementary Statistics*, 9th edition by Neil A. Weiss USBN 9780321989628, this is an ebook version with access to mymathlab. Texts can be purchased through www.pearson.com for $104.95. Purchasing a copy of the text is not mandatory.
- Graphing Calculator. Acceptable models include TI-83, TI-83+, TI-84, TI-84+, all other models please ask. (Instructor will be using a TI-83+).
    - Sharing of calculators during quizzes or exams will not be permitted.
    - Bring calculators to class. We will be using them throughout the semester.
    - If you don't have a calculator there is a classroom set you may use during class

Tests:

All tests, including the final will be paper and pencil test given in class. You are absent on the day of a test you must make arrangements to make up the test on your own time. Any test missed must be made up before the next test is given.

Grading Scale:

A	90.0-100%
B	80.0-89.9%
C	70.0-79.9%
D	60.0-69.9%
F	59.9% and below

Grading Allotment:
20% homework and quizzes and labs
60% In-class exams
20% Comprehensive Final Exam

Assignments/Homework: Homework will be assigned for each section of the textbook discussed and assessed weekly either by using the online homework program, quizzes, turning in the completed homework, or via other assessment methods.

Labs & Projects: There will be at least four technology-based labs throughout the semester. The purpose of the labs is to give you the opportunity to apply the concepts to real data.

Exams and Quizzes: There will be an exam given over material discussed after each chapter during the semester plus the final exam.

Final Exam: The final examination will be comprehensive on Chapters 1-11. The final exam. You are allowed one page of notes, Tables B, E, F, G, H, I, and a graphing calculator. Smartphones will NOT be allowed during exams.

Portable Electronic Devices:
Please extend courtesy to your instructor and fellow students by turning off your portable electronic devices such as: cell phones, pagers, and iPods. Although not an audio issue, text-messaging is a distraction to other students and prevents you from full participation in class. You should keep your portable electronic devices in your backpack or purse during class. Your personal electronic devices should not be on your desks. If you know that you may need to accept an emergency phone call during class, please let the instructor know. If you need to take a phone call during class, please step out of the classroom while you complete your call. Thank you for your cooperation.

Students with Disabilities
Any student requesting disability accommodation for this class must inform the instructor giving appropriate notice. Students are encouraged to contact Disability Support Services at Brush High School to certify documentation of disability and to ensure appropriate accommodations are implemented in a timely manner.

Changes
The instructor reserves the right to amend, adjust, or otherwise modify the outline and syllabus at any time during the course. Changes will be announced in class and posted online on Canvas. The new syllabus will be available under the 'Syllabus' link, and I will post an announcement on blackboard to make everyone aware of the changes.

UNC's Policies
Honor Code
All members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the

UNC community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

Academic Conduct
UNC's policies and recommendations for academic misconduct will be followed. For additional information, please see the Dean of Student's website, Student Handbook link http://www.unco.edu/dos/pdf/StudentCodeofConduct.pdf.

***Liberal Arts Core & Colorado gtPathways**
This course satisfies 3 credits of Area 2. (Mathematics) of the UNC Liberal Arts Core. This course has been approved by the Colorado Commission on Higher Education for inclusion in the Colorado Guaranteed Transfer Program, gtP. gtP courses automatically transfer to any public institution in Colorado and will continue to count toward general education or other graduation requirements for any liberal arts or science associate or bachelor's degree program IF a grade of C- or higher is recorded. Statewide articulation agreements prescribe specific general education and degree requirements in the following professional degree programs: business, early childhood, elementary education, engineering and nursing. Most other courses not approved for the gtP designation will also be accepted in transfer by other institutions but may not fulfill general education or degree requirements. For more information on the GT Pathways program, go to http://highered.colorado.gov/academics/transfers/.

Students who successfully complete the Area 2 Liberal Arts Core requirement in mathematics will have developed an understanding of fundamental mathematical concepts and their applications, will have developed their quantitative problem-solving skills, and will have developed a level of quantitative literacy that provides a foundation for success in their programs of study, careers, and citizenship.

Specifically, they will be able to:

- Demonstrate good problem-solving habits, including:
    - estimating solutions and recognizing unreasonable results
    - considering a variety of approaches to a given problem, and selecting one that is appropriate
    - interpreting solutions correctly;
- Generate and interpret symbolic, graphical, numerical, and verbal (written or oral) representations of mathematical ideas;
- Communicate mathematical ideas in written and/or oral form using appropriate mathematical language, notation, and style;
- Apply mathematical concepts, procedures, and techniques appropriate to the course;
- Recognize and apply patterns or mathematical structure;
- Utilize and integrate appropriate technology;
- Demonstrate competency in Quantitative Literacy by being able to:
    - Interpret Information
        - Explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).
    - Represent Information
        - Convert information into and between various mathematical forms (e.g., equations, graphs, diagrams, tables, words).
    - Perform Calculations
        - Solve problems or equations at the appropriate course level.
        - Use appropriate mathematical notation.
        - Solve a variety of different problem types that involve a multi-step solution and address the validity of the results.
    - Apply and Analyze Information

        - Make use of graphical objects (such as graphs of equations in two or three variables, histograms, scatterplots of bivariate data, geometrical figures, etc.) to supplement a solution to a typical problem at the appropriate level.
        - Formulate, organize, and articulate solutions to theoretical and application problems at the appropriate course level.
        - Make judgments based on mathematical analysis appropriate to the course level.
- Communicate Using Mathematical Forms
    - Express mathematical analysis symbolically, graphically, and in written language that clarifies/justifies/summarizes reasoning (may also include oral communication).
- Address Assumptions
    - Describe and support assumptions in estimation, modeling, and data analysis, used as appropriate for the course.

Students will be assessed on the content and competency criteria through a combination of tests, quizzes, labs and homework assignments.

Topics Covered:

- Nature of Probability and Statistics
    - Descriptive and Inferential Statistics
    - Variables and Types of Data
    - Data Collection and Sampling Techniques
    - Experimental Design
    - Using Technology
- Frequency Distributions and Graphs
    - Organizing Data
    - Graphing Data
- Data Description
    - Measures of Central Tendency
    - Measures of Variation
    - Measures of Position
    - Exploratory Data Analysis
- Probability
    - Sample Spaces and Probability
    - Addition Rules for Probability
    - Conditional Probability
- Discrete Probability Distributions
    - Probability Distributions
    - Binomial Distribution
- Normal Distribution
    - Standard Normal Distribution
    - Applications of the Normal Distribution
    - The Central Limit Theorem
- Confidence Intervals
    - For the Mean when σ is known
    - For the Mean when σ is unknown
    - For Proportions
    - For Variances and Standard Deviation
- Hypothesis Testing
    - Z-test for Means
    - T-test for Means
    - Z-test for Proportions
    - Chi-square Test for Variance or Standard Deviations

- Hypothesis Testing for Comparing Two Samples
  - Z-test for between Means
  - Independent Samples T-test
  - Dependent Samples T-test
  - Z-test between Proportions
  - F-test between Variances
- Correlation and Regression
  - Scatter plots and Correlation
  - Regression Analysis
  - Coefficient of Determination and Standard Error of Estimate
- Chi-Square Tests
  - Test for Goodness of Fit
  - Test for Independence
  - Test for Homogeneity of Proportions

Dropping or withdrawing from a course

- *Note:* ***Drop and withdrawal dates for the courses at your school can be found on your dual enrollment page for your high school.***
- Please use the Dual Enrollment Drop & Withdrawal Form.
- You can drop your course up until the designated Drop Deadline. The course will be removed from your transcript and you will receive a full tuition refund.
- After the Drop Deadline and up until the Withdrawal Deadline you can withdraw from your course. The course will remain on your transcript with a grade of "W" (this does not impact your GPA), and there is no tuition refund.
- After the withdrawal deadline you are unable to be removed from the course. The course will remain on your transcript with the grade that you have earned, and there is no tuition refund.
- If you stop attending the course but fail to officially withdraw from the course(s), you will be responsible for full tuition and fees and the course grade will remain on your transcript.