

**North Carolina Central University, Durham**

**School of Education**

**Department of Curriculum & Instruction**

**Introduction to Statistical Methods in Education**

**(EDGR 5910-O1-In-Class, 3 Credit Hours)**

**GRADUATE COURSE SYLLABUS (SUMMER 1 2023)**

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**Office Location:** School of Education (Room 2113)

**Office Hours**: Wednesdays, **4:00pm-7:00pm.**

**NCCU ACADEMIC INTEGRITY POLICY**

All students should be aware that the Department of Curriculum and Instruction takes the University Policy on Academic Integrity at NCCU very seriously.

Details regarding academic integrity can be found in Undergraduate Students Code of Academic Integrity and Graduate Academic Integrity Policy and these policies will be enforced in this course. It is your responsibility to read the codes. As a center of learning, teaching, and research, the North Carolina Central University charges its members, including students, to maintain patterns of behavior that enable the stated essential functions.

Academic Dishonesty Defined

Academic dishonesty is defined as any conduct that is intended by the student to obtain for him/her or for others an unfair or false evaluation in connection with any examination or other work for academic credit. Cheating, fabrication, plagiarism, and complicity are examples of conduct that is academically dishonest.

Cheating is the unauthorized use of materials in connection with an examination or other work for academic credit, including, but not limited to:

* The use of books, notes, outlines, etc. during an examination where the instructor has not authorized use of such materials or information;
* Seeking unauthorized materials or information from others in connection with an examination;
* Giving or attempting to give unauthorized assistance to another person in connection with an examination;
* Obtaining or attempting to obtain unauthorized copies of examinations; • Copying or attempting to copy from the work of another student during an examination;
* Bringing to an examination, or attempting to use during an examination, unauthorized answers prepared prior to the examination; and
* Submitting for evaluation in a course, part or the whole of a work for which credit has been given previously.

Fabrication is the invention, counterfeiting and/or alteration of quoted passages, data, procedures, experiments, sources or other information in connection with any academic exercise.

Plagiarism is the use of the ideas, words, or works of another without attribution when the information provided is not common knowledge either in content or form and includes, but is not limited to:

− Quoting from the published or unpublished work of another without appropriate attribution;

− Paraphrasing or summarizing in one’s own work any portion of the published or unpublished materials of another without attribution; and

− Borrowing from another’s work, data, and facts which are not in the domain of common knowledge.

Complicity is the giving of assistance or the attempt to give assistance to another for the purpose of perpetrating academic dishonesty.

**Adverse Weather**

Read <http://www.nccu.edu/health-safety/emergency/adverseweather.cfm> for the University’s policy on adverse weather and follow the instructions as outlined in the University policy. In addition, announcements regarding scheduled delays or the closing of the university due to adverse weather conditions will be broadcast on local radio and television stations.

**Course Description**

The Introduction to Statistical Methods in Education (EDGR 5910-01) is a graduate-level course in applied statistics applicable to education and the social sciences. In this course, I will introduce the basic concepts of statistical analysis, with a focus on both univariate and bivariate data. The course starts with an introduction to statistics terms and then moves on to organization and display of data. Analysis of univariate data by way of measures of central tendency (such as the mean or average), dispersion (such as the variance), and asymmetry ("skewness") is presented next, followed by an introduction to probability theory.

The relationship of probability to statistics is also discussed, providing students with the tools they need to understand how "chance" plays a role in statistical analysis. Statistical distributions, with a focus on the normal distribution and its uses, are also considered, along with a discussion of bivariate data and linear (least-squares) regression. Finally, the course culminates with a low-level introduction to hypothesis testing. Although this last topic could be a course of its own, the student is provided with enough theory and sufficient practice to conduct analyses of simple statistical hypotheses.

Students will be guided in a systematic process to compile, analyze, and interpret data resulting in a simple research paper. The course will prepare candidates to use statistical tools for making data-based decisions.

The course assumes a minimal understanding of algebra, but many of the concepts can be understood, and even many of the calculations performed, without an extensive mathematical background. This course is designed for anyone who wants a little more than just a cursory overview of statistics, but who does not want to get bogged down in the mathematical theory that underlies it.

**Course Methodology**

The Introduction to Statistical Methods in Education is an online course that will be infused with technology. It will be a student-centered learning environment where students are expected to work together as well as individually to foster a highly intellectual climate through deep reflection, scholarly discourse and the timely submission of course requirements that demonstrate the highest level of Eagle Excellence. Students are expected to participate in class discussions and complete all assignments by due dates as indicated in the course outline.

Students are expected to carefully go through this syllabus and course schedule. The instructor can be contacted with any questions or concerns at any time but students are advised to seek help anywhere that helps them make progress. This is a face-to-face class, but assignments and exams will be submitted via Canvas. To be sure, your username and password for Canvas and NCCU e-mail are the same. If you have questions about your Canvas account, call the IT department at 919-530-7676.

**Required Textbooks & Materials:**

There is one required text, one recommended text, and a few supplementary materials. The required text is where you will get most of your chapter readings and assignments. The writing style for the research paper is the APA style.

**Required Textbook**

|  |  |
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| Title | Statistics for the Behavioral Sciences |
| Authors | Fredrick J. Gravetter & Larry B. Wallnau |
| Edition | 10th |
| ISBN # | 978-1337098120. |

**Recommended text**

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| --- | --- |
| Title | Publication Manual of the American Psychological Association |
| Author | American Psychological Association (APA) |
| ISBN # | 978-1433805615. |

**Supplementary Materials**

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| To boost your learning, much of the course content will include links to videos and websites. There will also be articles that would help your reflection and comprehension of statistical concepts. As a virtual class, a computer with reliable Internet access will be very helpful as you would need to download and install some free software applications for projects and assignments. |

**Student Learning Outcomes**

Upon successful completion of this course, the student will be able to:

1. Demonstrate understanding of various statistical concepts and methods for summarizing and displaying data.
2. Compute frequencies, central tendency, variability, probability, z-score, t-tests (the one sample, two independent samples, and two related samples), correlations, Regression, and chi-Square.
3. Demonstrate knowledge of basic probability and statistical inference.
4. Align research questions with the appropriate statistical procedure.
5. Analyze data using the computer software and make data-based decisions.

**Course Communication Policies**

Students are encouraged to check their NCCU e-mails regularly to stay current and avoid missing any important information. To email your instructor or classmates, you can access the Send Email feature through Canvas via the Tools button. Please allow a 24-hour period to get a response to your e-mails except, may be during the weekend or on holidays, when it is likely to take longer, but you can be sure your inquiries will be responded to. Be patient. Please know that your official inquiries must be sent using your NCCU e-mail account linked with Canvas to avoid them being sent into the junk folder. Remember to provide your name, the class (EDGR 5910), and the subject of your message in the subject line of the email (e.g. EDGR 5910 Question about Homework Assignment).

**Technical Support**

Students are expected to have a working knowledge of Canvas. You should please direct any inquiries/issues related to Canvas and copy me. The Canvas Office can be reached at 919-530-7676. NCCU also has a 24-hour Canvas Helpdesk that can be reached at 1-(855) 588-2925. The Information Technology Services (ITS) is also available to students encountering computer issues.

**Appropriate Behavior**

Students are expected to be on their best behavior in class. You have to be courteous and respectful to your classmates and your instructor through considerate etiquette. In this course, maintaining a formal, respectful, civil, professional tone with all course communications is considered standard behavior. Students should try to avoid using derogatory language, obscenity, and hate speech. You are required use Standard American English for all projects and posts.

Your posts and responses should be thorough and thoughtful. Just posting "I agree" or "Good ideas" will not be considered adequate. Support your statements with explanations, examples, experiences, or references. And as graduate students, I would expect that your contributions to discussions, including posts and responses, should be complete and free of grammatical or structural errors.

**Statement of Inclusion/Non-Discrimination**

The North Carolina Central University (NCCU) is committed to the principles of affirmative action and nondiscrimination. The University welcomes diversity in its student body, its staff, its faculty, and its administration. The University admits, hires, evaluates, promotes, and rewards on the basis of the needs and relevant performance criteria without regard to race, color, national origin, ethnicity, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran's status, or religion. It actively promotes diversity and respectfulness of each individual.

**Student Accessibility Services**

Students with disabilities (physical, learning, psychological, chronic or temporary medical conditions, etc.) who would like to request reasonable accommodations and services under the Americans with Disabilities Act must register with the Office of Student Accessibility Services (SAS) in Suite 120 in the Student Services Building. Students who are new to SAS or who are requesting new accommodations should contact SAS at (919) 530-6325 or sas@nccu.edu to discuss the programs and services offered by SAS. Students who are already registered with SAS and who would like to maintain their accommodations must renew previously granted accommodations by visiting the SAS website at www.nccu.edu/sas and logging into Eagle Accommodate. Students are expected to renew previously granted accommodations at the beginning of each semester, preferably during the first two (2) weeks of class. Reasonable accommodations can be requested at any time throughout the semester; however, they will not be effective retroactively. Students are strongly encouraged to contact their professors to discuss the testing and academic accommodations that they anticipate needing for each class. Students identifying as pregnant or other pregnancy-related conditions who would like to request reasonable accommodations and services under Title IX must register with SAS.

**Confidentiality and Mandatory Reporting**

All forms of discrimination based on sex, including sexual misconduct, sexual assault, dating violence, domestic violence, and stalking offenses, are prohibited under NCCU’s Sexual Misconduct Policy (NCCU POL 01.04.4). NCCU faculty and instructors are considered to be responsible employees and are required to report information regarding sexual misconduct to the University’s Title IX Coordinator. The Sexual Misconduct Policy can be accessed through NCCU’s Policies, Regulations and Rules website at www.nccu.edu/policies. Any individual may report a violation of the Sexual Misconduct Policy (including a third-party or anonymous report) by contacting the Title IX Coordinator at (919) 530-7944 or TitleIX@nccu.edu, or submitting the online form through the Title IX Reporting Form, located at www.nccu.edu/titleix.

**Other Campus Programs, Services, Activities, and Resources**

Other campus resources to support NCCU students include:

* Student Advocacy Coordinator. The Student Advocacy Coordinator is available to assist students in navigating unexpected life events that impact their academic progression (e.g., homelessness, food insecurity, personal hardship) and guide them to the appropriate University or community resources. Contact Information: Student Services Building, Room G19, (919) 530-7492, studentadvocacy@nccu.edu.
* Counseling Center. The NCCU Counseling Center is staffed by licensed psychologists and mental health professionals who provide individual and group counseling, crisis intervention, substance abuse prevention and intervention, anger management, and other services. The Counseling Center also provides confidential resources for students reporting a violation of NCCU’s Sexual Misconduct Policy. Contact Information: Student Health Building, 2nd Floor, (919) 530-7646, counseling@nccu.edu.
* University Police Department. The University Police Department ensures that students, faculty and staff have a safe and secure environment in which they can live, learn, and work. The Department provides a full range of police services, including investigating all crimes committed in and around its jurisdiction, making arrests, providing crime prevention/community programs, enforcing parking regulations and traffic laws, and maintaining crowd control for campus special events. Contact Information: 2010 Fayetteville Street, (919) 530-6106, nccupdinfo@nccu.edu.

**Student Support Services for Veteran Students**

One of the goals of the faculty and the NCCU Veterans Affairs Office’s (VAO) is to provide a welcoming and supportive learning experience for veterans. Specifically, the VAO’s primary goal is to provide a smooth transition from military to college life for veterans, service members, and dependents. If you wish, please contact your professor and/or the Director of the VAO during the first weeks of class so that we may support and assist you. During your matriculation, the VAO is here to assist you with the VA Educational Benefits process and offer overall support to ensure academic progression towards graduation. For more information please contact the VAO at 919-530-5000 or veteransaffairs@nccu.edu.

**Class Attendance Policy**

Class attendance is expected of students at North Carolina Central University and represents a foundational component of the learning process in both traditional on-campus and online courses. Students should attend all sessions of courses for which they are registered for the entire scheduled period and are responsible for completing all class assignments. Instructors will keep attendance records in all classes. Instructors must clearly state on the syllabus how class attendance will factor into the final grade for the course. Faculty will include a written statement of the attendance guidelines in their course syllabi and will review the guidelines during the first class session. Beginning from Fall 2017 NW and NF attendance grades are no longer assigned. A student who misses three consecutive class meetings, or misses more classes than the instructor deems advisable is subject to being dropped from the course. Students who miss class to participate in university-authorized activities or to respond to military orders are given excused absences for the missed class time. It is the student’s responsibility to inform the instructor of such activities at least one week before the authorized absence, and to make up all work as determined by the instructor. Although EDGR 5910, Introduction to Statistical Methods in Education, is a face-to-face format, students are responsible for going to Canvas on a regular basis to view relevant communications and are expected to spend the time required to keep current on the readings and assignments. Attendance is an important part of the course experience. Attendance includes being physically present and actively participating in class. Many topics could be covered in class that are not included in the text or other readings. Students are responsible for presenting adequate reason for absences to the instructor in writing. To the extent possible, students should notify the instructor in advance about anticipated absences. Students are encouraged to complete scheduled assignments prior to the absence when possible. If students cannot give advance notice of an absence, they should notify the instructor as soon as possible for the reason for the absence with appropriate documentation. (Adequate reasons include personal illness; medically necessary absences due to pregnancy or childbirth; death or illness in the immediate family; military obligations; inclement weather; religious holidays; court-imposed legal obligations; approved accommodations by the Office of Services for Individuals with Disabilities; or participation in a pre-approved university activity.) Missing two consecutive class times makes the student subject to being dropped from the course for non-attendance.

**Course Assessment**

We will have a homework assignment after every lecture, a mid-term exam, and a comprehensive final exam.

**Grading Policy**

The final grade in this course will be determined as follows:

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| Homework Assignments | 20% |
| Mid-term Exam | 40% |
| Final Exam | 40% |

Your final letter grade will be based on the following tentative curve:

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| A | 90 -100 |
| B | 80 – 89 |
| C | 60 – 79 |
| F | 0 – 59 |

**Attendance Policy:**

* Attendance at all classes will be recorded and is mandatory.

**A Brief Note**

Students, and people generally, say a lot of disparaging things about statistics. A good number of them believe that “you can prove anything with Statistics.” They will disregard a claim, even when based on data, as “just a statistical trick.” To be sure, Statistics has often been used to mislead the unsuspecting public in various contexts, and this has brought some notoriety.

This perception of Statistics is also widespread among college students and they generally, do not find the subject exciting neither do they see it as fun. On the contrary, Statistics can be fun, regardless of what people say on the street. Even though Statistics does not get the respect it deserves, it helps us to think clearly with data. Take it from me (your latest friend) a little practice thinking statistically is all one needs to start seeing the world more clearly and accurately.

Anyhow, statistics is a tool that, if used properly, can be of tremendous help in education, math, science, engineering, history, politics, and numerous other fields. As you study Statistics, always remember that it is more than just math: which simply involves the manipulation of numbers through addition, subtraction, multiplication, division, and other mathematical operations. It also involves language and units: when a statistician provides a statistic, it involves a number and a label of some sort. For instance, the number $24,500 is not in and of itself a statistical value; "an average salary of $24, 500," however, is a statistical value.

This linguistic aspect of statistics sometimes allows a certain amount of ambiguity that can be misleading. As I assured you earlier, the study of statistics will equip all of you to identify and understand both uses and abuses of this tool. My hope is that each and every one of you would find the subject interesting and useful beyond the mathematical skills that it imparts and become part of a vanguard defending against attempts by the unscrupulous to mislead others.

**Chinasa Ukpabi, Ph.D.**

**COURSE OUTLINE**

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| **WEEKS** | **TOPICS** | **COURSE ACTIVITIES** | **ASSIGNMENTS & DUE DATES** |
| **WK 1**  May 25 | Greetings, small talk, and pre-course teaser  Introduction to Statistics | -Personal Introductions (Getting to know one another).  -Introducing the Syllabus and relevant Technology.  -General Course Description.  -Basic concepts of statistical analysis, with a focus on both univariate and bivariate data | **Assignment 1.**  Due date as posted on Canvas |
| **WKs 2**  Jun. 1 | Organization and display of data.  Measures of Central Tendency. | Frequency Distributions  Mean, Median, and Mode  [www.youtube.com/watch?v=GrynkZB3E7M](http://www.youtube.com/watch?v=GrynkZB3E7M) | **Assignment 2.**  Due date Jun. 6 |
| **WK 3**  Jun. 8 | Measures of Dispersion  Statistical Distributions  Measures of Relative Standing | -Variance, Standard Deviation, Range, Mean Absolute Deviation.  [www.youtube.com/watch?v=rStwdZUshY](http://www.youtube.com/watch?v=rStwdZUshY)  -Skewness (Asymmetry)  -Normal Distributions  -Understanding z-scores  [www.youtube.com/watch?v=NY2zWGBXBhU](http://www.youtube.com/watch?v=NY2zWGBXBhU)  -Z-score statistics | **Assignment 3.**  Due date Jun. 13 |
| **WK 4**  Jun. 15 | Probability Theory  Probability and Samples | Intro. to Probability Theory [www.youtube.com/watch?v=UnVc-cRSxds](http://www.youtube.com/watch?v=UnVc-cRSxds) Distribution of Sampling Means  [www.youtube.com/watch?v=AY3O\_qsSnbE](http://www.youtube.com/watch?v=AY3O_qsSnbE) | **Assignment 4.**  Due date Jun. 20 |
| **WK 5**  Jun. 22 | Hypothesis Testing  And the t-Statistic | Introduction to Hypothesis Testing [www.youtube.com/watch?v=VK-rnA3-41c](http://www.youtube.com/watch?v=VK-rnA3-41c)  -Formulating Hypothesis  [www.youtube.com/watch?v=JV2-WHzreFo](http://www.youtube.com/watch?v=JV2-WHzreFo)  [www.youtube.com/watch?v=0Pd3dc1GcHc](http://www.youtube.com/watch?v=0Pd3dc1GcHc) | **Assignment 5.**  **&**  **Mid-term Exam**  Due date Jun. 27 |
| **WK 6**  Jun. 29 | Correlation Analysis  &  Regression Analysis | Understanding Correlation and its calculation    Introduction to Regression Analysis | **Assignment 6.**  Due date Jul. 6 |
| **WK 7**  Jul. 6 | Analysis of Variance-ANOVA    The Chi-Square | Introduction to ANOVA & Chi-Square  [www.youtube.com/watch?v=qV-WoquC4dA](http://www.youtube.com/watch?v=qV-WoquC4dA)  Tests for Goodness of Fit and Independence  [www.youtube.com/watch?v=SvKv375sacA](http://www.youtube.com/watch?v=SvKv375sacA) | **Assignment 7.**  Due date Jul. 11 |
| **WK 8**  Jul. 13 |  | **REVISION & FINAL EXAM** | Due date Jul. 14 |

**Chinasa Ukpabi, Ph.D.**