	MATH106 Statistics I
2024-2025	
Department	**Department of Mathematics & Science**
Instructor	**Tyler Kiliulis**
Term and Year	**2024-25 School Year**

Rationale:
An understanding of statistical content is necessary for application in virtually any academic discipline and career path. Statistics provides the basis required for analysis and justification of claim and forms the foundation for effective research.

Vision of a Graduate:
The WLC Graduate will be an effective communicator, a strong collaborator, a creative problem solver, a self-directed learner, and a responsible citizen.

Course Description:
An introductory course in statistics concerned with the basic concepts involved in statistical analysis. Special emphasis is placed in an integrated coverage and presentation of descriptive and inductive statistical tools and techniques in support of meaningful decision making. Topics include: scales of measurement, random sampling, graphs and tables, measures of central tendency, probability and probability distributions, confidence intervals, error and sample size estimation, hypothesis testing, linear correlation, regression analysis and prediction. Prerequisite: Placement exam score. Students who do not satisfactorily place into MATH106N with the required Accuplacer or SAT scores will be required to enroll in the corresponding Co-Requisite Workshop.

Course Competencies:
At the successful completion of this course the student should be able to:

1. Explain how statistics can be properly used and misused.
2. Accurately interpret graphically expressed data.
3. Summarize descriptive data using various statistical measures.
4. Identify the degree of correlation between variables and perform linear regression analysis.

5. Calculate mean and standard deviation under varied conditions.
6. Perform various methods of Hypothesis Testing.
7. Apply the rules of probability.
8. Solve various problems involving normally distributed data.
9. Explain how to apply the central limit theorem.
10. Infer how sample data can be used to obtain interval estimates.

Essential Questions:
- Why is it so critical to know how data is collected?
- What are the benefits of using an equation to model data? How does one know how well an equation models a set of data?
- Why is it important to use measures of center and variation together?
- How do you determine if there is a statistical significance?
- How does the normal distribution apply to the real world?

Required Materials:

Textbook(s):
Brase and Brase's *Understanding Basic Statistics: Fifth Edition* and *Understanding Basic Statistics: Eighth Edition*

OpenStax's *Introductory Statistics*

Supplemental Materials:
- Notebook
- Unit Workbook (given for each unit)

Course Expectations:

Students will:
- Come to class with all of their required materials, which includes a pen/pencil, a notebook or
lined paper, their unit packet, and their fully charged chromebook
- Put away any phones or headphones, unless they have an accommodation
- Follow the collaboration procedures in class, working together on whiteboard problems while
staying silent during instruction and individual assignments
- Use appropriate language and treat other students with respect

The teacher will:
- Post notes within a week of the lesson
- Give advanced notice of upcoming summative assessments
- Be available many days after school and before school for extra help

- Monitor email, even during weekends and other school breaks to answer any questions or concerns from students

- Give extensions for students that are absent for extended periods of time, or provide time to catch up on previous work

Class Procedures

At the beginning of every unit, students will be given a unit packet. This will contain a list of all the vocabulary in the unit and practice problems for the unit, all in one place. Alongside these practice problems, students will take handwritten notes in a notebook so the two do not get confused. Students must bring this unit packet to class every day, and will take it home to complete homework assignments.

On a given skinny block day, the structure of the class will look like this:

1) Students will arrive to class, take out their packets and their notebook. They will turn to their completed homework for the teacher to check, and in their notebook work on the warm up on the board

2) The teacher will go over the warm up, and ask if the class has any questions on the homework

3) Depending on the lesson of the day, about 10-25 minutes will be spent going over a lesson, corresponding with one of the objectives of the unit. The teacher will explain the motivation behind the lesson, describe any key terms, do practice problems on the board, etc. During the lesson, students will take notes in their notebook and ask questions for clarification

4) Students will then break out into "whiteboard groups" where 2-4 students will work together at their own whiteboard. The teacher will project questions on the board, and students will work together to solve these problems in a set amount of time. Depending on the lesson, this will take between 10-25 minutes.

5) After the whiteboard problems, students will return to their desks to work in their workbooks. Each lesson has a corresponding set of practice problems that they must complete on their own. If they do not finish these problems, it will be assigned as homework, which will be checked the next day

Grading:
- Formative Assessments - 20%
    - Includes group work participation, classwork/homework, and quizzes. While exact point values vary, quizzes are generally once a week and are worth 20 points, classwork/homework is every day that is worth 5-10 points each, and participation is rare and worth 5 points each
- Summative Assessments - 60%
    - Includes tests and unit projects
- Midterm/Final - 20%
    - The midterm exam and final exam are each worth 10% of the total grade

Grades will be assigned according to the following department scale:

> 93	A		73-76	C	
90-92	A-		70-72	C-	
87-89	B+		67-69	D+	
83-86	B		63-66	D	
80-82	B-		60-62	D-	
77-79	C+		< 60	F	

Available Support Services

NCC Library:
Get help with research for your papers and assignments from the NCC librarian and staff. Email ncclibrary@ccsnh.edu.

Tutoring and Writing Center:
The Tutoring and Writing Center, located in the library, offers free academic support services to all NCC students. https://library.nashuacc.edu/home/tutoring

Accessibility*:*
Students who think they may have or have a documented disability (physical, learning, or mental health) and/or had an IEP or 504 Plan in high school who may need classroom accommodations must meet with the Accessibility Services Coordinator to set up an NCC Reasonable Accommodation Plan (RAP). For more information view the Accessibility page: https://www.nashuacc.edu/student-services/disability-accessibility-information and/or contact Jodi Quinn, Accessibility Services Coordinator (office located in the library), at jquinn@ccnsh.edu or (603) 578-8996.

College Policies

Non-Discrimination:
The NCC Equity Committee is designated to coordinate compliance with the Non-Discrimination Policy and handles all concerns of discrimination that occur on campus that are not covered under Title IX. View more information here Non-Discrimination Policy and Grievance Procedure

Title IX:
Classroom instructors at Nashua Community College are encouraged to create and maintain a safe learning environment in which students feel able to share opinions and related life experiences in classroom discussions, in written work, and in meetings with professors. To the greatest extent possible, this information will be kept private. However, staff and faculty have a legal obligation to report information concerning

sexual misconduct, violence and exploitation of individuals per federal statute and in compliance with established policies and procedures at Nashua Community College. If you have been subjected to sexual misconduct, violence or exploitation, we encourage you to contact your NCC Title IX Coordinator, Craig Nelson, for support and assistance. He can be reached at Nashua Community College, 505 Amherst Street, Nashua, NH, 603-406-4521 or cjnelson@ccsnh.edu. You may also contact Bridges, the local crisis center, for free and confidential services at their 24hr support line 603-883-3044. You do not need to be in crisis to call. Nashua Community College encourages you to download uSafeUS® https://usafeus.org/, a free and confidential app that helps protect yourself and your community. Additional information including resources can be found here <u>Title IX Policy and Grievance Procedure.</u>

Attendance:
Regular attendance and active participation are essential for academic success and NCC takes student attendance very seriously.

Recognizing that excessive absences impact student learning, any attendance concerns will be addressed collaboratively by the instructor and Nashua Community College and may result in penalties up to and including student withdrawal from or failure of the course.

Academic Conduct:
All students are expected maintain high standards of academic integrity as they complete their coursework at NCC. Cheating and plagiarism are violations of the Student Code of Conduct and all instances of academic dishonesty are taken very seriously by the College.

<u>Cheating</u>

<u>NCC Plagiarism Policy</u>

Diversity, Equity, and Inclusion Statement:
<u>Diversity, Equity, and Inclusion Statement | Nashua Community College</u>

Course Outline

Sequence (e.g., Units, Grading	Topic	Summative Assessments	Targeted Competencies*

Terms, or Months)			
2 weeks	**1) Collecting Data**	**Unit Test**	**Explain how statistics can be properly used and misused** **Accurately interpret graphically expressed data** **Summarize descriptive data using various statistical measures** **—**
3 weeks	**2) Single Variable Analysis**	**Unit Test / Project**	**Explain how statistics can be properly used and misused** **Accurately interpret graphically expressed data** **Summarize descriptive data using various statistical measures** **Calculate mean and standard deviation under varied conditions** **—**
3 weeks	**3) Two-Variable Analysis**	**Unit Test / Project**	**Explain how statistics can be properly used and misused** **Accurately interpret graphically expressed data**

4 weeks	**4) Probability**	**Unit Test**	**Summarize descriptive data using various statistical measures** **Identify the degree of correlation between variables and perform linear regression analysis** **—** **Explain how statistics can be properly used and misused** **Calculate mean and standard deviation under varied conditions** **Apply the rules of probability**
2 weeks	**5) Discrete Probability Distributions**	**Unit Test**	**—** **Calculate mean and standard deviation under varied conditions** **Apply the rules of probability** **—**
3 weeks	**6) Normal Distribution**	**Unit Test**	**Calculate mean and standard deviation under varied conditions** **Apply the rules of probability**

3 weeks	**7) Estimation**	**Unit Test**	**Solve various problems involving normally distributed data** **Explain how to apply the central limit theorem** **—** **Explain how statistics can be properly used and misused** **Calculate mean and standard deviation under varied conditions**
3 weeks	**8) Hypothesis Testing**	**Unit Test / Project**	**Solve various problems involving normally distributed data** **Explain how to apply the central limit theorem** **Infer how sample data can be used to obtain interval estimates** **—** **Explain how statistics can be properly used and misused** **Identify the degree of correlation between variables and perform linear regression analysis** **Calculate mean and standard deviation under varied conditions**

1 week (or until end of year)	**9) Chi-Squared Test**	**Unit Test**	**Perform various methods of hypothesis testing** **Explain how to apply the central limit theorem** **Infer how sample data can be used to obtain interval estimates** **—** **Calculate mean and standard deviation under varied conditions** **Perform various methods of hypothesis testing** **Apply the rules of probability**

*Targeted competencies refer to the established course competencies listed above.

State Competencies:
https://docs.google.com/document/d/1ITvNZ1xWjKnfTDm66q7K_SrtrVx0FF86wAR0K
oJHIiw/edit?usp=sharing
Scope and Sequence:
https://docs.google.com/document/d/1mq3FsetvYd2hDhIVEMk8mFzT6ZKAk8Y15Fy5l
DM39t0/edit?usp=sharing
Remediation Process:
https://docs.google.com/document/d/1ApOAuA-todcxUq_Q8LbovHOTic4TI64TvZzSJd
ohβk4/edit?usp=sharing