

Course: **STAT 215 Section 001: Introduction to Probability and Statistics.  
CRN: 87033**

Instructor: Dr. John Twist  
**E-mail: [jntwist@mail.wvu.edu](mailto:jntwist@mail.wvu.edu)**  
**Web Page: <https://stat.wvu.edu/~jntwist/>**

Schedule: Tuesday and Thursday, 10:00 am to 11:15 am

Location: Armstrong 209

Communication: eCampus Announcements will be provided as needed.  
Email me. I will typically respond within 24 hours.

Office Hours: Tuesdays 5:00 pm to 8:00 pm, Hodges 109 (Computer Lab)  
Thursdays 2:30 to 4:00 pm, Armstrong 210F (Office)

Course Description: Probability, random variables, discrete and continuous probability distributions, joint probability distributions, expected value, variance and correlation. The central limit theorem. Point and interval estimation and tests of hypotheses. Chi-square tests, linear regression, correlation and ANOVA. The course is lecture based in-person using PowerPoint slides.

Expected Learning

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

1. Generate and interpret descriptive and graphical summaries of data;
2. Describe common sampling methods and basic experimental design concepts;
3. Apply principles of counting for sample space to compute probabilities of simple, compound, and conditional events and evaluate independence;
4. Specify and use probability mass functions, probability density functions, cumulative density functions, and joint density functions to calculate probabilities for random variables;
5. Calculate expected value, variance, and covariance for random variables and linear combinations of random variables;
6. Describe how various probability distributions arise, including binomial, multinomial, negative binomial, geometric, Poisson, uniform, normal, exponential, chi-squared,  $t$ , and  $F$ , and calculate probabilities using these;
7. Specify and use sampling distributions and the Central Limit Theorem to calculate probabilities;
8. Compute and interpret confidence intervals for a population mean, population proportion, population mean difference, difference in two population means, and difference in two population proportions;
9. Perform hypothesis tests for a population mean, population proportion, population mean difference, difference in two population means, and difference in two population proportions;
10. Perform chi-squared goodness of fit, independence, and homogeneity tests;
11. Calculate and interpret a correlation coefficient;
12. Interpret the results of simple linear regression and ANOVA from software output.

## Required Materials:

MyStatLab student access code for electronic access to eText: Probability and Statistics for Engineers and Scientists, 9<sup>th</sup> Edition, MyStatLab 2021 Update, by Walpole *et al.* Publisher is Pearson. **Purchase directly from Pearson to ensure a valid access code to the electronic homework problems through MyStatLab.** StatCrunch software is included in the package. Examples of using this software will be included in the lectures. I will also provide Excel formulas for many of the examples given in the lectures. StatCrunch or Excel can be used to generate solutions and/or verify hand-calculations to many of the assigned homework problems.

eCampus will be the central hub for information, access to MyStatLab homework problems, PowerPoint lectures in PDF format, homework submission and communication of grade point totals.

I will use an iClicker course: **STAT-215-001 (John Twist)** to track attendance, take polls during class and request feedback at the end of every lecture. The service is free and requires a WIFI connected device (phone, tablet or laptop). Instructions can be found at: <https://macmillan.force.com/iclicker/s/article/How-to-Create-an-iClicker-Student-Account>. I will also post student access information links in an “Announcement” on eCampus.

**Any model standalone calculator that can take square roots will be required. No internet or cell phone/laptop usage is allowed during either Exam.** The TI-84 Plus or TI-*n*spire CX-II calculators provides the statistical functions used in this course. Both are excellent all-around calculators. The cost is about \$60 to \$100 for the TI-84 Plus (depending on screen preference) and \$220 for the TI-*n*spire CX-II. See attached tutorial for TI-84 Plus: ([https://www.openintro.org/go/?id=stat\\_ti\\_83\\_84\\_guide&referrer=/book/os/index.php](https://www.openintro.org/go/?id=stat_ti_83_84_guide&referrer=/book/os/index.php))

## Evaluation:

1. Two exams worth a total of 650 points. Each exam will have two approximately equally valued parts (multiple choice concept questions and worked problems) given on Tuesday and Thursday class periods. **You can use a two-sided letter size paper with personalized information such as formulas, diagrams and comments (handwritten or printed) for both parts of each exam.**

Exam 1: 275 points (Tentatively September 27<sup>th</sup> and 29<sup>th</sup> after Lecture #11)

Exam 2: 375 points (December 13<sup>th</sup> and December 15<sup>th</sup>)

2. Eleven homework assignments worth 25 points each with *the lowest score dropped*.  $10 \times 25 = 250$  points total. **Homework will be done electronically via MyStatLab which can be accessed directly via eCampus.** The system generates unique problem variables for each student. It is important to work the problems carefully since the system has a small tolerance for rounding errors. The level of rounding is specified for each problem. Due dates for each assignment will be available through the Pearson site.
3. Seven quizzes worth 20 points each with *the lowest two scores dropped*.  $5 \times 20 = 100$  points total.

#### 4. Bonus Point Opportunities:

- a) Class attendance via iClicker (2 points per class session, up to 40 points total).
- b) Two homework assignments (just prior to exams) will have bonus point opportunities (5 points each)
- c) The last three quizzes will have bonus point opportunities (2 points per quiz).
- d) Each exam (problems part) will have bonus point opportunities (15 points).
- e) Student Evaluation of Instructor: 5 points for each student if achieve at least 90% class participation.

#### Grade Assignment:

There are 1000 points possible in this course (not including bonus points). ***I have the discretion to scale grades. This will only be done if the class average of net total points (includes bonus points), is less than 750 points.***

A	= 950+ Points
A-	= 900-949 Points
B	= 850-899 Points
B-	= 800-849 Points
C	= 750-799 Points
C-	= 700-749 Points
D	= 600-699 Points
F	= 0-599 Points

#### Tutoring and Homework Assistance:

I will go over lecture material and provide guidance related to homework questions during office hours. I am open to scheduling one hour Zoom meetings upon request.

The link for the tutoring center (Eiesland Hall G29):

- ✓ <https://mathanddata.wvu.edu/students/current-students-impl/math-learning-center-tutors>

## Course Schedule:

STAT-215-01, CRN: 87033, Dr. John Twist							
Armstrong 209, Tuesday/Thursday 10:00 am to 11:15 am							
Date	Day	Lecture	Topic	Text Chapter	Homework	Quiz	Exam
18-Aug-22	Thursday	1	Introduction to Statistics and Data Analysis	Chapter 1			
23-Aug-22	Tuesday	2			1		
25-Aug-22	Thursday	3	Sample Space, Events, Counting, Probability, Probability Rules, Independence, Bayes' Rule	Chapter 2			
30-Aug-22	Tuesday	4			2		
1-Sep-22	Thursday	5	Random Variables, Discrete Distributions, Continuous Probability Distributions, Joint Probability Distributions	Chapter 3		1	
6-Sep-22	Tuesday	6			3		
8-Sep-22	Thursday	7	Expected Value, Variance and Covariance, Linear Combinations, Chebyshev's Theorem	Chapter 4			
13-Sep-22	Tuesday	8			4		
15-Sep-22	Thursday	9	Discrete Distributions	Chapter 5		2	
20-Sep-22	Tuesday	10					
22-Sep-22	Thursday	11			5		
27-Sep-22	Tuesday						Exam 1 (Concepts)
29-Sep-22	Thursday						Exam 1 (Problems)
4-Oct-22	Tuesday	12	Continuous Probability Distributions	Chapter 6			
6-Oct-22	Thursday	13			6		
11-Oct-22	Tuesday	14	Sampling Distributions, Central Limit Theorem, t and F Distributions, Q-Q Plots	Chapter 8		3	
13-Oct-22	Thursday	15			7		
18-Oct-22	Tuesday	16	Statistical Inference, Estimation Methods, Standard Error, Confidence Interval for Mean, Prediction and Tolerance Intervals	Chapter 9 9.1 to 9.7		4	
20-Oct-22	Thursday	17					
25-Oct-22	Tuesday	18			8		
27-Oct-22	Thursday	19	CI for Difference in Means, CI for Proportion and Difference in Proportions, Estimating the Ratio of Two Variances	Chapter 9 9.8 to 9.13		5	
1-Nov-22	Tuesday	20					
3-Nov-22	Thursday	21			9		
8-Nov-22	Tuesday	<b>Election Day: University Closed</b>					
10-Nov-22	Thursday	22	Introduction to Hypothesis Testing, Use of p-values, Hypothesis Test for Mean and Mean Difference, Test for Difference in Means (Pooled and Unpooled Cases)	Chapter 10 (10.1 to 10.7)		6	
15-Nov-22	Tuesday	23					
17-Nov-22	Thursday	24			10		
22-Nov-22	Tuesday	<b>Fall Recess: University Closed</b>					
24-Nov-22	Thursday	<b>Fall Recess: University Closed</b>					
29-Nov-22	Tuesday	25	Test for Proportions and Difference in Proportions, Chi-Square Tests: Goodness of Fit, Independence, and Homogeneity	Chapter 10 (10.8 to 10.13)		7	
1-Dec-22	Thursday	26					
6-Dec-22	Tuesday	27	ANOVA: Analysis of Variance (One-Way), Correlation and Simple Linear Regression	Chapters 13/11 (13.3, 13.6, 11.1)	11		
8-Dec-22	Thursday	28					
13-Dec-22	Tuesday						Exam 2 (Concepts)
15-Dec-22	Thursday						Exam 2 (Problems)

**Academic Integrity:** The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code at <http://www.arc.wvu.edu/admissions/integrity.html>

**Social Justice:** West Virginia University is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran's status, religion, sexual orientation, color or national origin.

**Disability Services:** If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Disability Services (304-293-6700).

**Compliance with current WVU policy with regards to Covid-19 restrictions is mandatory.**