

**Math 106**  
**Introduction to Probability and Statistics II**  
**Syllabus**

**Instructor:**

Name:  
Office:  
Phone:  
E-mail:

**Office Hours:**

TBD  
Others by arrangement.

**Course Information:**

Time:  
Location:  
Text: *Elementary Statistics, Tenth Ed*, by Mario F. Triola  
Prerequisites: Math 105

**COURSE DESCRIPTION:**

This is the second course in the Probability and Statistics sequence. Topics include: random variables, the binomial and normal distributions, correlation, regression, confidence intervals, and hypothesis testing. Computer/ calculator applications will be discussed using EXCEL spreadsheets and HHC.

**COURSE OBJECTIVES:**

At the conclusion of this course, the cadet will be able to:

1. Calculate point estimates for population parameters.
2. Calculate and interpret confidence intervals for population parameters.
3. Construct, execute, and interpret tests of hypotheses of parameters.
4. Construct, execute, and interpret Chi-Square tests.
5. Construct, utilize, and interpret simple linear regression models.
6. Calculate and interpret measures of goodness of fit and correlation.

You will learn these skills by covering the following sections of the text:

Chapter 6: Normal Probability Distribution—A Review  
Chapter 7: Estimates and Sample Sizes  
Chapter 8: Hypothesis Testing  
Chapter 9: Inference from Two Samples  
Chapter 10: Correlation and Regression  
Chapter 11: Multinomial Experiments and Contingency Tables

In addition to learning specific skills you will also be learning to think in a logical, creative, mathematical way. This way of thinking will benefit you long after you have forgotten the specific skills that we cover in class.

Learning Outcomes:

Finally, we will focus on six different learning outcomes.

1. Understand quantitative relationships, make geometric observations, and formulate sound estimations.
2. Work with abstract concepts, mathematical variables, and symbols.
3. Solve mathematical equations.
4. Read, interpret, and create graphical information.
5. Use appropriate mathematical technology.
6. Understand the effective, appropriate, and efficient use of mathematical techniques for real-world problems.

**Grading:**

Tests: 56% (Four tests at 14% each)  
Coursework: 14%  
Final Exam: 30%

**Attendance Policy:**

The following is the attendance policy at VMI. Academic excellence is best achieved through consistent class attendance. The maximum allowed percentage of class absences is 30%. No categories of absences (academic, athletic, guard, 3.0 cuts, etc.) will be exempt from that percentage. When a cadet reaches 20% absences, the instructor issues a written warning and the cadet must sign a receipt that he/she is aware of the absences incurred. Upon reaching 30% absences the cadet is referred to the Dean for appropriate action. Normally a cadet who exceeds the 30% absences will be required to withdraw from the course with a W or a WF.

**Calculator/Computer Algebra System (CAS) usage:**

Unless otherwise stated, you may use a calculator to perform basic calculations such as arithmetic and trigonometric calculations on any assignment. Additionally you will be able to make use of the probability and statistical functions on your calculator.

**Work for Grade:**

"**Work for grade**" is defined as any work presented to an instructor for a formal grade or undertaken in satisfaction of a requirement for successful completion of a course or degree requirement. All work submitted for grade is considered the cadet's own work. "**Cadet's own work**" means that he or she has composed the work from his or her general accumulation of knowledge and skill except as clearly and fully documented and that it has been composed especially for the current assignment. No work previously submitted in any course at VMI or elsewhere will be resubmitted or reformatted for submission in a current course without the specific approval of the instructor.

In all work for grade, failure to distinguish between the cadet's own work and ideas and the work and ideas of others is known as **plagiarism**. Proper documentation clearly and fully identifies the sources of all borrowed ideas, quotations, or other assistance. The cadet is referred to the VMI authorized handbook for rules concerning quotations, paraphrases, and documentation.

In all written work for grade, the cadet must include the words "**HELP RECEIVED**" conspicuously on the document, and he or she must then do one of two things: (1) state "none," meaning that no help was received except as documented in the work; or (2) explain in detail the nature of the help received. In oral work for grade, the cadet must make the same declaration before beginning the presentation. Admission of help received may result in a lower grade but will not result in prosecution for an honor violation.

Cadets are prohibited from discussing the contents of a quiz/exam until it is returned to them or final course grades are posted. This enjoiner does not imply that any inadvertent expression or behavior that might indicate one's feeling about the test should be considered a breach of honor. The real issue is whether cadets received information, not available to everyone else in the class, which would give them an unfair advantage. If a cadet inadvertently gives or receives information, the incident must be reported to the professor and the Honor Court. Each cadet bears the responsibility for familiarizing himself or herself thoroughly with the policies stated in this section, with any supplementary statement regarding work for grade expressed by the academic department in which he or she is taking a course, and with any special conditions provided in writing by the professor for a given assignment. If there is any doubt or uncertainty about the correct interpretation of a policy, the cadet should consult the instructor of the course. There should be no confusion, however, on the basic principle that it is never acceptable to submit someone else's work, written or otherwise, formally graded or not, as one's own.

The violation by a cadet of any of these policies will, if he or she is found guilty by the Honor Court, result in his or her being dismissed from VMI. Neither ignorance nor professed confusion about the correct interpretation of these policies is an excuse.

**Departmental Work for Grade Policy:**

The faculty of the Department of Mathematics and Computer Science fully supports the Institute Work for Grade Policy as passed by the Academic Board and approved by the Superintendent. Because of this, every faculty member in our department will promptly contact any cadet who has submitted work for grade without the expression "**HELP RECEIVED**" followed by the word "none" or an explanation of the nature of the help received. The faculty member will inform the cadet that the work will not be graded until the cadet adds the required "**HELP RECEIVED**" statement to the work.

**Writing Center:**

The use of the Writing Center is approved for all courses offered by the Department.

**Tutoring, Peer Collaboration, Academic Center:**

It is our department's policy that any work submitted for grade precludes the aid of any tutors or peer collaboration unless specifically stated otherwise by the instructor in the course syllabus. Tutors and peer collaboration are authorized for assigned work that is not graded, such as homework or drill exercises.

**Use of Computer Aids:**

Computer Science Courses

In these courses the cadets may make use of editors, compilers, and any other approved software packages. Spelling, style and grammar checkers are also approved for cadet use.

Mathematics Courses

In these courses, the use of software packages is **not** permitted unless specifically stated otherwise by the instructor in the course syllabus. However, spelling, style, and grammar, checkers are approved for cadet use.

The use of a calculator is to be determined by the instructor as appropriate for each course.

**Open door policy:**

Please let me know if you have any concerns or problems during this course. I want you to succeed at VMI, and specifically in Math 106.

**Your Responsibility:**

Make sure that you understand all of the policies in this document, especially the policies concerning work for grade. If you do not understand or if you disagree with any part of this document you must contact the instructor immediately.

**A suggested day-by-day guide for covering the material in Math 106.**

<b>Text Section</b>	<b>Topic</b>	<b>Class Hour</b>	<b>Suggested Homework</b>
6-1, 6-2, 6-3	Overview, The Standard Normal Distribution and Applications of Normal Distribution	1	p257: 1-28, 37-40, 41, 43. p266: 1-16, 20-22. p268: 28, 29, 30.
6-4	Sampling Distributions and Estimators	2	p278: 1-8, 11, 14.
6-5	The Central Limit Theorem	3	p287: 1-10, 17-20, 22, 23.
6-6	Normal Approximation to Binomial	4,5	p298: 13, 14, 18, 30.
6-7	Assessing Normality	6	p307: 1,5,10,14
Chapter Review	Chapter 6		p311: 1,2 p312: CE 2 p314: TP 1-8
7-1, 7-2	Estimating a Population Proportion	7,8	p333: 5, 6, 10, 14, 18, 22, 26
7-3	Estimating a Population Mean, $\sigma$ known	9	p346: 9, 12, 14, 18, 25, 29
7-4	Estimating a Population Mean, $\sigma$ unknown	10	p359: 5, 8, 12, 17, 23, 26
7.5	Estimating a Population Variance	11	p372: 1, 5, 10, 14, 22
<b>Chapters 6, 7</b>	<b>Test 1</b>	<b>12</b>	
8-1, 8-2	Basics of Hypothesis Testing	13	p403: 1, 2, 5, 6, 10, 15
8-2, 8-3	Testing a Claim about a Proportion	14, 15	p403: 18, 22, 24, 30, 33, 34, 43 p414: 1, 3, 7, 10
8-4	Testing a claim about a mean, $\sigma$ known	16, 17	p423: 5, 9, 17
8-5	Testing a claim about a mean $\sigma$ unknown	18, 19	p431: 2, 3, 6, 9, 12, 17, 19
8-6	Testing a claim about Variation	20	p441: 1, 4, 5, 6, 16
<b>Chapter 8</b>	<b>Test 2</b>	<b>21</b>	
9-1, 9-2	Inferences about two proportions	22, 23	p463: 5, 9, 13, 21
9-3	Inferences about two means: Independent samples	24, 25	p478: 1, 3, 5, 11, 13, 16, 18
9-4	Inferences from matched pairs	26, 27	p489: 1, 3, 5, 11, 13, 16, 19
9-5	Comparing Variation in Two Samples	28, 29	p502: 5, 11, 14
<b>Chapter 9</b>	<b>Test 3</b>	<b>30</b>	
10-1, 10-2	Correlation	31, 32	p532: 4, 5, 9, 12, 13, 18, 20, 25
10-3	Regression	33, 34	p553: 1-4, 9, 13, 18, 24, 25
10-4	Variation and Prediction Intervals	35, 36	p563: 1-4, 13, 14, 18
11-1, 11-2	Goodness of Fit	37, 38, 39	p600: 1, 4, 5, 11
11-3	Contingency Tables: Independence and Homogeneity	40, 41	p600: 18, 19, 25 p616: 6, 9, 15, 17
<b>Chapter 10, 11</b>	<b>Test 4</b>	<b>42</b>	
Final Exam			