

STAT 314 (Section 001)

Applications of Statistics

Instructor: Dr. Scott Street

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Office Hours:

Tuesday	11:00 AM – 12:00 PM
Tuesday	1:00 PM – 2:00 PM
Wednesday	2:00 PM – 3:00 PM

and by appointment

Texts: *Statistics: The Exploration and Analysis of Data*, Sixth Edition (ISBN 0-495-39087-9) by Devore & Peck, Thompson Brooks-Cole Publishers, 2007.
Student Solutions Manual (ISBN 0-495-11876-1), by Mortlock, Thompson Brooks-Cole Publishers, 2007.

Course Description: A study of the concepts and application of statistical methods including: estimation and hypothesis testing for two sample problems; one factor analysis of variance and multiple comparisons; randomized block designs and analysis; inferences on categorical data, including chi-square test for independence for contingency tables; simple linear regression and correlation; multiple linear regression. Special topics include distribution free (nonparametric) methods in various statistical problems, two factor analysis of variance, and the use of a statistical software package for data analysis. **Prerequisite:** STAT 210 or STAT 212. This section meets on Mondays and Wednesdays in Harris Hall 2140 from 10:00 AM – 11:50 AM for 29 days during Fall 2009.

Topics	Textbook Chapters	Time
Confidence Intervals and Hypothesis Testing using a single sample and for comparing two populations	Chapters 9 – 11, 16	11 days
Categorical Data Analysis, One-Way Analysis of Variance, Two-Way Analysis of Variance, Multiple Comparisons, Randomized Block Designs	Chapters 12, 15, 16	11 days
Simple Linear Regression, Multiple Linear Regression, Variable Selection, Regression Inferences	Chapters 5, 13, 14	7 days

Exams: There will be three exams this term, and they are subject to the rules of the VCU Honor System. If you **must** miss an exam, you should contact me (I have voice mail) in advance; DO NOT EXPECT MAKE-UP EXAMS!!

The **tentative** test dates are:

EXAM 1 (Chapters 9 – 11)	September 30
EXAM 2 (Chapters 12 & 15)	November 9
EXAM 3 (Chapters 5, 13 & 14)	December 2

Homework: Homework will be assigned in class and will be due periodically throughout the term. You may work together on the homework, but what you turn in should represent your own understanding of the problems. These assignments must be completed so that **only one side** of each piece of paper is used (page-backs will **not** be graded), and all of those pages must be **stapled** together; points will be deducted if this procedure is not followed. If you have difficulty with any of the homework, I will be more than happy to work with you. NO LATE HOMEWORK will be accepted except in **extreme** circumstances and only with **advance notice**. Selected homework problems will be graded on a three point scale: three points (if done correctly), two points (if there are minor errors), one point (if reasonably attempted), and no points (if not attempted). Solutions to all assigned homework problems will be made available.

Grading:	HOMEWORK (Total combined score)	100 pts.
	PROJECTS (Total combined score)	100 pts.
	EXAM 1	100 pts.
	EXAM 2	100 pts.
	EXAM 3	<u>100 pts.</u>
	TOTAL	500 pts.

A (450 – 500 pts.); B (400 – 449 pts.); C (350 – 399 pts.); D (300 – 349 pts.); F(0 – 299 pts.)

THERE WILL BE NO EXTRA CREDIT ASSIGNMENTS

Calculator/Software: A calculator *that you know how to use* is required for this class. I recommend the TI-83 series or TI-84 series graphing calculators because they have built-in statistical capabilities. Sharing of calculators **will not** be permitted. Most assignments will incorporate PASW software; this software is available at VCU for FREE for Windows, or you may use it for FREE using “App2Go Citrix Server” (see <http://www.at.vcu.edu/faq/stats/spss.html>).

Attendance: You are expected to attend class regularly and to arrive on time. Classes will not be held on Monday, September 7 due to Labor King Day, nor will class be held on Monday, October 9 due to Dr. Street being out of town. The last day of this class is Wednesday, December 2.

Withdrawal Date: The last day to **withdraw** from the course is Friday, October 30.

Important: If you must miss a class for some reason, be sure to call me or a fellow student for the lecture notes; furthermore, if you **must** miss a class in which an assignment is due or a test is to be given, it is in your best interests to notify me ahead of time (even if you must call just before class begins)! Remember...do not expect me to accept late assignments or to give make-up tests.

Policies:

1. All assignments must be single-sided and stapled unless directed otherwise. Also, for PASW exercises, only the relevant output should be included, and it should be well-labeled and identified. All exercises should be submitted in numerical order (**don't** just staple the PASW exercises to the end of the handwritten exercises).
2. Classroom computer usage will be limited to class-related exercises and demonstrations only. Checking email and surfing the web are not permitted, and doing so may result in your removal from the classroom.
3. Cell phones and beepers/pagers must be turned off in class. Violators may have the offending devices confiscated or may be dismissed from the classroom in accordance with Virginia Commonwealth University's policies governing student conduct in the classroom, and these policies will be enforced in their entirety at all times in this class. Further details on student conduct policies may be found in the *Undergraduate Bulletin* and at <http://www.pubapps.vcu.edu/bulletins/undergraduate/?uid=10096&iid=30774>.
4. The VCU Honor System applies at all times in this class. For specific details on the VCU Honor System, please visit http://www.provost.vcu.edu/pdfs/Honor_system_policy.pdf.
5. University Rules and Procedures prohibit anyone “to have in his possession any firearm, other weapon, or explosive, regardless of whether a license to possess the same has been issued, without the written authorization of the President of the University...”
6. Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 require Virginia Commonwealth University to provide an ‘academic adjustment’ and/or a ‘reasonable accommodation’ to any individual who advises us of a physical or mental disability. If you have a physical or mental limitation that requires an academic adjustment or an accommodation, please arrange a meeting with me at your earliest convenience. Additionally, if any of your course work requires you to work in a lab environment, you should advise the instructor or department chairperson of any concerns you may have regarding safety issues related to your limitation(s).
7. All students are expected to comply with the Student Computer Initiative: <http://www.vcu.edu/sci/>.

Helpful Hints:

1. If you have an emergency, it is your responsibility to notify the instructor as soon as possible.
2. Get the name and phone number of two or three of the students in this class to call if you miss class, to ask questions when you need help, or to form study groups.
3. If you have questions, please feel free to ask either during class or during my office hours. Class participation is strongly encouraged.
4. **The concepts of this course build upon one another as the course progresses. To succeed, you must master each concept when it is presented. For this reason, you must put forth an adequate amount of time and effort on the problems and reading material on a regular basis.**
5. If the fire alarm is sounded, we will evacuate the building and meet as a class in a designated area outside. If the emergency siren is sounded, we will remain in the classroom with the doors locked and will follow the instructions at <http://www.vcu.edu/alert/>. You should sign-up for the VCU Alert text messaging service at <http://www.vcu.edu/alert/notify/> (VCU Alerts will be sent automatically to your VCU email).

DAY	DATE	TEXTBOOK	TOPICS COVERED	HOMEWORK	DUE
1	08/24/09	Ch. 1-8	Introduction / Syllabus / Intro to PASW (formerly SPSS) / Notation / Review of STAT 210/212 Topics	Skim Chapters 1-8 Read Chapters 9 & 10	08/26/09 08/31/09
2	08/26/09	9.1-9.2	Point Estimation / Confidence Intervals for a Population Proportion / PASW	pp. 386-389: 12, 20, 24, 25, 29	09/09/09
3	08/31/09	9.3-9.4	Confidence Intervals for a Population Mean / PASW	pp. 400-402: 32, 33, 37, 43, 44*, 47*, 48 * = Use PASW for these problems	09/09/09
4	09/02/09	10.1-10.3	Hypothesis Tests for a Population Proportion / Errors in Hypothesis Testing / PASW	pp. 426-428: 12, 14, 15, 20 pp. 440-442: 23, 24, 34*, 35, 40	09/16/09 09/16/09
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5	09/09/09	10.4	Hypothesis Tests for a Population Mean / PASW	pp. 451-453: 46, 56, 60, 63*, 64*	09/16/09
6	09/14/09	10.5-10.6	Power and Probability of Type II Error	p. 463: 67, 68	09/16/09
7	09/16/09	11.1-11.2	Inferences Concerning the Difference Between Two Population Means / PASW	pp. 488-495: 1, 9, 24*, 26, 27 (n ₁ =72, n ₂ =17) pp. 505-509: 32*, 36, 42	09/28/09 09/28/09
8	09/21/09	11.3-11.4	Inferences Concerning the Difference Between Two Population Proportions / PASW	pp. 517-518: 47, 48*, 57	09/28/09
9	09/23/09	16.1-16.2 (Supplement)	Mann-Whitney Rank Sum Tests / Wilcoxon Signed Rank Tests / PASW	pp. 16-8-16-9: 3a*, 4, 5 pp. 16-20-16-22: 8, 9*, 11, 14, 18	09/28/09
10	09/28/09		Review for Exam 1		
11	09/30/09		Exam 1 on Chapters 9, 10, 11, 16		
12	10/05/09	12.1	Chi-Squared Goodness-of-Fit Tests / M&M Activity / PASW	pp. 542-545: 1, 4, 9*, 13	10/14/09
13	10/07/09	12.2-12.3	Chi-Squared Test for Homogeneity or Independence / PASW	pp. 561-562: 29, 30, 31, 33*	10/14/09
14	10/12/09	15.1	Introduction to the Basics of Analysis of Variance (ANOVA) & F Tests	pp. 674-680: 1, 14*, 16, 19, 22	10/26/09
15	10/14/09	15.1 15.2	Analysis of Variance (ANOVA) / F Tests / PASW Multiple Comparisons / PASW	pp. 686-687: 23, 24, 25, 26*, 27	10/26/09
16	10/19/09	-----	NO CLASS TODAY — Dr. Street will be out of town		
17	10/21/09	15.3 (Supplement)	Randomized Block Designs (RBD ANOVA) / PASW	pp. 15-7-15-9: 35, 36, 39, 41*	11/02/09
18	10/26/09	15.4-15.5 (Supplement)	Two-Factor Analysis of Variance (Two-Way ANOVA) / Means Plots / PASW	pp. 15-19-15-21: 45, 46, 48, 53, 56*	11/02/09
19	10/28/09	15.4-15.5 (Supplement)	Two-Factor Analysis of Variance (Two-Way ANOVA) / Means Plots / PASW		
--	10/30/09	-----	Last Day To Withdraw From Classes Without Receiving A Grade Of "W"		
20	11/02/09	16.3 (Supplement)	Nonparametric Analysis of Variance (Kruskal-Wallis Tests) / PASW Nonparametric Randomized Block Designs (Friedman's Tests) / PASW	pp. 16-29-16-30: 21, 21*, 25, 25*	11/04/09 11/04/09
21	11/04/09		Review for Exam 2		
22	11/09/09		Exam 2 on Chapters 12, 15, 16		
23	11/11/09	5.1-5.3, 5.6	Poster Presentations for Project #2 (ANOVA) / Correlation / Scatterplots / Regression / PASW	pp. 260-262: 66, 70, 71*, 75, 77	11/18/09
24	11/16/09	13.1-13.2	Simple Linear Regression Model / Inferences on the Slope of the Population Regression Line / PASW	p. 583: 4, 5, 7 pp. 592-594: 12, 16, 19	11/24/09 11/24/09
25	11/18/09	13.3-13.6	Inferences on the Population Correlation Coefficient / Checking Model Adequacy / Predictions / PASW	pp. 606-607: 30, 32 pp. 613-615: 34, 38, 39, 43* p. 619: 52, 54, 57	11/24/09 11/24/09 11/24/09
26	11/23/09	14.1-14.2	Multiple Regression Models / Model Utility / Reducing Models / PASW	pp. 640-642: 2, 7, 10 pp. 655-657: 15, 20, 22, 23*	11/30/09 11/30/09
27	11/25/09	14.3-14.5 (Supplement)	Inferences using Multiple Regression Models / Diagnostic Techniques / PASW	pp. 14-10-14-13: 34, 35, 36, 48* pp. 14-23-14-26: 51, 56, 59*, 60	11/30/09 11/30/09
28	11/30/09		Review for Exam 3		
29	12/02/09		Exam 3 on Chapters 5, 13, 14		
Exam	12/11/09 9:00 AM		Oral Presentations for Project #3 (Multiple Regression)		