



Columbia College
 Jefferson City Campus
 3314 Emerald Lane
 Jefferson City, MO 65109

Course Syllabus
 09 / 14 - Spring Session
 March - May 2010

Course Prefix and Number: SOCI 324 A

Course Title: Statistics for the Behavioral and Natural Sciences

Semester Credit Hours: 3

Class Day and Time: Mon Wed
5: 15 PM-7:45 PM

Instructor: **Elena Stepanova**

Home Phone: 573-441-0298 (up to 8 PM)
CougarMail: evstepanova@cougars.ccis.edu

Catalog Description

The study of parametric and nonparametric statistics commonly used in the behavioral and life sciences. Included are analyses of relationship and variance, as well as effect sizes associated with each. Students majoring in Biology or Psychology must earn a grade of C or higher. Cross-listed as BIOL/PSYC 324. Prerequisite: MATH 150 or higher.

Prerequisites/Corequisites

MATH 150 or higher.

Assessment

Material from this course may be tested on the Major Field Test (MFT) administered during the Culminating Experience course for the degree.

Text

Statistics for the Behavioral Sciences 4th (2003) edition

Author: Thorne, B. M., & Giesen, J. M. (McGraw-Hill)

ISBN: ISBN-10: 0072832517; ISBN-13: 978-0072832518

A Simple Guide to SPSS for Version 17.0 w/software 2010 edition

Author: Kirkpatrick, L.A., & Feeney, B. C. (Wadsworth)

ISBN: ISBN-10: 1-111-19368-1; ISBN-13: 978-1-111-19368-3

Course Objectives

- To correctly choose the appropriate statistical test for a given set of data.
- To compute basic descriptive statistics.
- To compute basic parametric and nonparametric statistics.
- To interpret the results of descriptive and inferential statistical analyses.
- To use a scientific calculator and a packaged computer program (e.g. Statistica, SAS, SPSS, etc.) to compute statistics.

Additional Instructor Objectives

- Know math and logic behind methods of descriptive and inferential statistics
- Learn how to be critical consumers of research
- Apply information obtained to your future endeavors, academic or not

Measurable Learning Outcomes

- Explain the basic research designs, including correlational method and experimental method.
- Define sample and population.
- Describe the four scales of measurement.
- Create simple, relative and cumulative frequency distributions from data sets.
- Describe the characteristics of normal and non-normal distributions of data.

- Calculate measures of central tendency, including mean, median and mode using a scientific calculator.
- Describe when the use of mean, median and mode is appropriate.
- Using a scientific calculator, calculate measures of variability, including range, sample and population variances, sample and population standard deviations, estimations of the population variance and standard deviation, and the standard error of the mean.
- Apply the standard deviation to a normal distribution.
- Describe the usefulness of transformed scores.
- Calculate and interpret z-scores, T scores and percentiles.
- Describe correlations between two variables (e.g., negative, positive, none).
- Interpret a scatterplot based on the slope of regression line and the dispersion of data around the line of best fit.
- Calculate a simple regression line and use it for prediction.
- Calculate the standard error of the estimate and demonstrate an understanding of the error in prediction.
- Describe and explain the basics of probability (e.g., region of rejection, alpha level, p).
- Describe and explain statistical hypothesis testing, including rejecting and failing to reject the Null Hypothesis.
- Describe and explain errors in statistical decision-making (i.e., Type I and Type II Errors).
- Define power of a statistical test and the ways in which power can be maximized.
- Calculate and interpret Confidence Intervals.
- Define independent samples.
- Correctly choose which statistic is appropriate for a given sample, calculate results and interpret, for the z-test and the single-sample t-test.
- Describe and explain when it is appropriate to choose parametric versus non-parametric statistics.
- Describe and explain the logic of an analysis of variance (ANOVA).
- Demonstrate competence for when it is appropriate to choose to calculate post-hoc comparisons (e.g., Tukey Test).
- Calculate post-hoc comparisons using a statistical software program and interpret the results.
- Correctly choose which statistic is appropriate for a given sample and develop a statistical hypothesis to test. Then using a statistical software program, develop a spreadsheet, calculate the main statistic and interpret the result. Next, calculate an effect size/coefficient of determination and interpret the result. This process should be demonstrated for at least 10 of the following statistical tests:
 - Spearman Rank-Order Correlation
 - Pearson Product-Moment Correlation
 - t-test for independent samples
 - t-test for dependent samples
 - one-way ANOVA for independent samples
 - one-way ANOVA for dependent samples
 - two-way ANOVA for independent samples
 - two-way ANOVA for dependent samples
 - mixed design two-way ANOVA
 - Mann-Whitney U test
 - Rank sums test
 - Wilcoxon Test
 - Kruskal-Wallis H
 - Friedman's ANOVA
 - One-way chi-square analysis
 - Two-way chi-square analysis

Special Course Requirements

A calculator able to calculate square roots is required.

You will need to install SPSS Student Version 17.0 software on your home computer/laptop. The software is compatible with Microsoft Windows XP and Vista. Please let the instructor know by Monday, March 29, if you cannot install the software on your computer, so that accommodations can be made.

Regular class attendance is strongly recommended. You will not be able to pass this class unless you attend lectures. Much of the material discussed in class is not covered in your textbook.

Students missing class are responsible for all material presented in class and for any modifications to the course calendar that are announced in class. If you expect to miss a class, make arrangements beforehand with a classmate who takes good class notes.

Instructional Methods

You are required to read assigned reading materials prior to the lecture on the relevant chapters. You are also responsible for completing four SPSS assignments, as they are a part of your grade.

Also, a number of extra-credit opportunities will be available and will be described in class throughout the session. You cannot earn more than 10 points total on all your extra-credit assignments.

Homework will be assigned for each chapter. It is strongly recommended that students complete homework assignments, but it is not required (as homework is not a part of your grade). Homework provides excellent preparation for exams. Time will be provided during class for students to ask questions or seek help with the homework problems.

Graded Activities

Exam 1	40 Points	20% of grade
Description -		

Multiple choice test over Chapters 1-6 and material presented in class.

Method of Evaluation -

This exam will consist of 40 multiple-choice questions worth 1 point each.

Exam 2	40 Points	20% of grade
Description -		

Multiple choice test over Chapters 7-9 and material presented in class.

Method of Evaluation -

This exam will consist of 40 multiple-choice questions worth 1 point each.

Exam 3	40 Points	20% of grade
Description -		

Multiple choice test over Chapters 10-12 and material presented in class.

Method of Evaluation -

This exam will consist of 40 multiple-choice questions worth 1 point each.

Exam 4	40 Points	20% of grade
Description -		

Multiple choice test over Chapters 13-15, pp. 370-371, and material presented in class.

Method of Evaluation -

This exam will consist of 40 multiple-choice questions worth 1 point each.

Four SPSS assignments	40 Points	20% of grade
Description -		

Over the course of the session, the instructor will distribute several SPSS assignments. You are responsible for completing four of them worth 10 points (5% of your grade) each.

Method of Evaluation -

Each SPSS assignment will be graded according to the scope and nature of it, and points allocation will be explained.

Extra Credit	10 (maximum) Points
---------------------	---------------------

Description -

Over the course of the session, students frequently ask about "extra credit." For a variety of reasons, students sometimes don't perform up to their abilities and expectations and want to improve their grades.

A number of extra-credit (EC) opportunities will be available, most of them worth 5 points each. Note that you cannot earn more than 10 points total on all your EC assignments. Your EC points are added on top of your final score of 200 total possible points.

Method of Evaluation -

EC assignments will be graded according to the scope and nature of each of the assignments, and points allocation will be explained.

Grading Scale

90 - 100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

Additional Information / Instructions

Minimum point totals (4 exams, 4 SPSS assignments, and optional EC) required for each final grade are as follows: A = 180 (90%), B = 160 (80%), C = 140 (70%), D = 120 (60%). If you are taking this class Pass-Fail, you must earn a C or better to earn a passing grade.

Mastering statistics requires that students work regularly and avoid procrastination and cramming. Attend every class session. Read the text and complete assigned homework problems either prior to or soon after the lecture that covers the material.

Prior to each exam, a review session will be held during regular class time. This session is not intended to replace class attendance and doing the homework on a regular schedule. Prior to the review session, you should have identified your areas of weakness and formulated your questions.

Chapter study guides are available on-line, along with additional problems and other useful resources, see

http://highered.mcgraw-hill.com/sites/0072832517/student_view0/

As shown on the course calendar, the course has been divided into four units, each consisting of 3-6 text chapters. There will be one exam per unit, covering both conceptual material and computations. Although advanced statistical concepts naturally build from simpler ones, the exams will only cover material presented in their respective units. Also, there is no cumulative final exam.

Weekly Activities and Assignments

Week 1 - March 22 & 24**Course Introduction, Language of Statistics, Definitions and Scaling; Frequency Distribution, Graphing Data, Central Tendency**

Activities: M: Course Introduction & Syllabus Overview

Lecture on Chapters 1 & 2

W: Lecture on Chapters 3-5

Reading: W: Chapters 1-5

Week 2 - March 29 & 31

Variability and Standard Scores; Probability

Activities: M: Lecture on Chapter 6
Review 1
W: Exam 1
Lecture on Chapter 7

Reading: M: Chapter 6
W: Review Chapters 1-6 and relevant lecture material

Examinations: Exam 1-March 31

Week 3 - April 5 & 7**Normal Distribution, Confidence Intervals and Hypothesis Testing; One-Sample t test**

Activities: M: Review of Exam 1
Lecture on Chapters 7 & 8
W: Lecture on Chapters 8 (cont.) & 9

Reading: M: Chapter 7
W: Chapter 8

Assignments: M: SPSS Assignment 1 due

Week 4 - April 12 & 14**Confidence Intervals and Hypothesis Testing (cont.); One-Sample t Test (cont.); Two-Sample t Test**

Activities: M: Lecture on Chapter 9 (cont.)
Review 2
W: Exam 2
Lecture on Chapter 10

Reading: M: Chapter 9
W: Review Chapters 7-9 and relevant lecture material

Examinations: Exam 2-April 14

Week 5 - April 19 and 21**Two-Sample t Test (cont.); Analysis of Variance: One-Way**

Activities: M: Review of Exam 2
Lecture on Chapters 10 (cont.) & 11
W: Lecture on Chapters 11 (cont.)

Reading: M: Chapter 10
W: Chapter 11

Assignments: W: SPSS Assignment 2 due

Week 6 - April 26 & 28**Analysis of Variance: Two-Way; Correlation and Regression**

Activities: M: Lecture on Chapter 12
Review 3

W: Exam 3

Lecture on Chapter 13

Reading:

M: Chapter 12

W: Review Chapters 10-12 and relevant lecture material

Assignments:

M: SPSS assignment 3 due

W: SPSS assignment 4 due

Examinations:

Exam 3-April 28

Week 7 - May 3 & 5

Correlation and Regression (cont.); Chi-Square; Nonparametric Tests

Activities:

M: Review of exam 3

Lecture on Chapter 13 (cont.) & 14

W: Lecture on Chapters 14 & 15

Reading:

M: Chapters 13 & 14

W: Chapter 15

Assignments:

W: SPSS assignment 5 due

Week 8 - May 10 & 12

Nonparametric Tests (cont.); Determining the Appropriate Test

Activities:

M: Lecture on Ch. 15 (cont.) & pp. 370-371.

Review 4

W: Exam 4

Review of Exam 4

Wrap-up

Reading:

M: pp. 370-371

W: Review Chapters 13-15, pp.370-371 and relevant lecture material

Assignments:

M: SPSS assignment 6 due

Examinations:

Exam 4-May 12

Library Resources

Columbia College Resources - Online databases are available at <http://www.ccis.edu/offices/library/index.asp>. You may access them from off-campus using your eServices login and password when prompted.

Course Policies and Procedures

Attendance

Columbia College Policy - Columbia College students are expected to attend all classes and laboratory periods for which they are enrolled. Students are directly responsible to instructors for class attendance and work missed during

an absence for any cause. If absences jeopardize progress in a course, an instructor may withdraw a student from the course with a grade of "F" or "W" at the discretion of the instructor.

Instructor Policy - Regular class attendance is strongly recommended. Much of the material discussed in class is not covered in your textbook. Students missing class are responsible for all material presented in class and for any modifications to the course calendar that are announced in class. If you expect to miss a class, make arrangements beforehand with a classmate who takes good class notes.

Academic Integrity

Columbia College Policy - Columbia College students must fulfill their academic obligations through honest, independent effort. Dishonesty is considered a serious offense subject to strong disciplinary actions. Activities which constitute academic dishonesty include plagiarism, unauthorized joint effort on exams or assignments, falsification of forms or records, providing false or misleading information, or aiding another in an act of academic dishonesty. Possible penalties for these activities are discussed in detail in the AHE Degree Completion Catalog.

Class Conduct and Personal Conduct

Columbia College Policy - Students must conduct themselves so others will not be distracted from the pursuit of learning. Students may be disciplined for any conduct which constitutes a hazard to the health, safety, or well-being of members of the college community or which is deemed detrimental to the college's interests. Discourteous or unseemly conduct may result in a student being asked to leave the classroom. Examples of misconduct and possible disciplinary actions are described in the AHE Degree Completion Catalog.

Cancelled Class Make-Up

Columbia College Policy - Classes cancelled because of inclement weather or other reasons must be rescheduled.

Campus Policy - If classes are cancelled due to inclement weather all radio and television stations will be notified that the Jefferson City Campus has closed. Cancellations will also be posted on the Jefferson City website. Decisions to cancel class will be made by 3:00pm.

Make-Up Examinations

Columbia College Policy - Make-up examinations may be authorized for students who miss regularly scheduled examinations due to circumstances beyond their control. Make-up examinations must be administered as soon as possible after the regularly scheduled examination period and must be administered in a controlled environment.

Instructor Policy - Students are expected to take all exams during class on the announced exam dates. In an event of highly extenuating circumstances (e.g., death of a close relative or serious personal illness), please contact the instructor prior to the exam. You will be asked to provide a written documentation, and a make-up will be arranged. Minor illness, death of a person other than a close relative, etc., is not excused.

Adding, Dropping or Withdrawing from a Course

Columbia College Policy - Students may add a course during the first week of the session and drop a course without academic or financial liability through close of business on Monday of the second week of the session. Once enrolled, a student is considered a member of that class until he or she officially drops or withdraws in accordance with College policy. An official drop/withdrawal takes place only when a student has submitted a Drop/Add/Withdrawal form. A failure to attend class, or advising a fellow student, staff or adjunct faculty member of an intent to withdraw from a class does not constitute official drop/withdrawal. The drop/add/withdrawal periods begin the same day/date the session starts, not the first day a particular class begins. If a student stops attending a class but does not submit the required Drop/Withdrawal form a grade of "F" will be awarded. The AHE Degree Completion Catalog contains details concerning drop/withdrawal and financial liability.

Withdrawal Excused

Columbia College Policy - A student may request an excused withdrawal (WE) under extraordinary circumstances by submitting a Drop/Withdrawal form accompanied by an complete explanation of the circumstances and supporting documentation to the campus director. The WE request must include all classes in which the student is currently enrolled. The Vice President for Adult Higher Education is the approving authority for all WE requests. A student who receives approval of their WE request may still be required to return some or all of the federal financial assistance received for the session. See the AHE Degree Completion Catalog for details.

Incomplete

Columbia College Policy - A student may request that the instructor award a grade of "I" due to extraordinary circumstances (unforeseen or unexpected circumstances beyond the student's control) that prevent a student from completing the requirements of a course by the end of a session. An "I" will not be given because a student is failing, negligent or not meeting requirements. If the instructor believes an "I" is appropriate, the instructor will specify the work needed to complete the course and the time allowed to complete the work. Work missed must be made up within two subsequent sessions unless the instructor specifies an earlier date. Extensions beyond two sessions must be approved by the Vice President for Adult Higher Education. If the work is completed during the specified time period, the instructor will change the "I" to the grade earned. If the work is not completed during the specified time, the instructor may allow the incomplete to remain on the student's permanent record or change it to any other letter grade.

Instructor Policy -

A grade of incomplete is normally not given, unless there are highly extenuating circumstances that are documented in a timely manner. When such circumstances occur prior to the deadline for withdrawing from a course, students are encouraged to withdraw from the course rather than request an incomplete.

Grade Appeal

Columbia College Policy - A student may appeal any grade given if it is believed to be in error or in conflict with Columbia College policy and procedures. The student must state in writing to the Campus Director why the grade awarded is believed to be in error and request a desired remedy. The faculty member who awarded the grade will be given the opportunity to comment on all student allegations. If the issue cannot be resolved at the campus the appeal will be transmitted through the Director to the Vice President for Adult Higher Education. A grade appeal must be received for review by the Vice President for Adult Higher Education prior to the end of 60 days from the date the grade was awarded.

Instructor Policy - The instructor will be communicating your exam scores and EC points throughout the course of the class. In an event of a grade dispute, email the instructor and arrange an appointment. Note that instructor will not engage in a grade dispute over the phone.

Prerequisites

Columbia College Policy - Course prerequisites are established to ensure that a student has adequate academic preparation to succeed in the course. Staff members will attempt to ensure that students meet prerequisite requirements, but it is the student's responsibility to determine if prerequisites exist and to enroll in courses in the proper sequence. In exceptional cases in which the student clearly possesses the required skills and knowledge to succeed in a course, the campus director may waive the prerequisite in coordination with the faculty member. Waiver of a prerequisite does not remove the requirement for the student to complete the course if it is required in the degree program.

eServices

Columbia College Policy - The college provides all students access to CougarMail (the official means of e-mail communication for the College), online resources from the Stafford Library, and their Columbia College records (transcripts, grades, student schedules, etc.) through eServices.

Use of Cougarmail

Columbia College Policy - The official student email address (also known as CougarMail) will be used for all official correspondence from faculty and staff. Students are responsible for the information received and are required to monitor their email account on a regular basis. Students may forward their CougarMail to another email account but will be held responsible for the information sent over CougarMail, even if there is a problem with the alternate mail service.

Cell Phones

Columbia College Policy - Cell phones can be a distraction to the learning process. Campus directors or course instructors may require that cell phones be turned off or set to vibrate during class periods. Students requiring special arrangements to receive a cell phone call during class should make prior arrangements with their director or course instructor.

Instructor Policy - Students are required to turn off cell phones during class.

Course Textbooks

Columbia College Policy - The textbooks listed on this syllabus are required for this course. They are guaranteed to be available through the authorized textbook suppliers designated by Columbia College. The college is not responsible for the academic or financial consequences of late textbook orders or incorrect editions not purchased from a college-authorized vendor.

FERPA

Columbia College Policy - The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights are described in detail in the AHE Degree Completion Catalog.

ADA

Columbia College Policy - Students with documented disabilities who may need academic adjustments or auxiliary aids or services for this course must contact the Campus Director to request accommodation.

ADDITIONAL CAMPUS POLICIES

Children -

For their safety and the school's liability, do not bring children to class or leave unattended in the building.

Additional Instructor Policies

LAPTOPS - Students are allowed to bring laptops to class and use them for educational purposes only (e.g., notes taking). Emailing, instant messaging, gaming and other irrelevant activities are not permitted.