

SEATTLE PACIFIC UNIVERSITY
School of Business, Government, and Economics

Business 2700	Statistics for Business and Economics
Winter 2018	Douglas Downing
9-11am TuTh, McKenna 113	Office: 216 McKenna Hall
5 credits	Phone: 281-2890 email: ddowning@spu.edu
	You're welcome to come to my office.
	It is best to make an appointment by
	e-mail. Check the internet at
	<i>http://spu.edu/ddowning</i>
	for office hours (which change each week).
	Appointments at other times can also
	be arranged if you would like.

Catalog description:

BUS 2700 Statistics for Business and Economics

Prerequisite: MAT 0145 or Mathematics Placement Level B and Spreadsheet Competency. An introduction to descriptive and inferential statistics with emphasis on problems from business and economics. Topics include graphical representation of data, probability, discrete and continuous distributions, Central Limit Theorem, confidence intervals, hypothesis testing, one-way ANOVA, correlation and linear regression. Spreadsheet software is used for data management, analysis, and reporting. This course satisfies the Ways of Knowing - Quantitative Reasoning requirement.

Objectives:

This course covers concepts in statistical inference. The goal of the course is to provide students with an understanding of the process of analyzing data to reach conclusions about the system generating the data. During the course we will develop statistical concepts by building upon probability theory. No previous background in probability or statistics is expected, but you should be familiar with basic algebra. Specific learning objectives for this course include developing the ability to:

1. calculate descriptive statistics (average, median, variance, standard deviation)
2. calculate and apply probabilities for random variables with binomial and normal distributions
3. calculate confidence intervals for an unknown population mean and an unknown population proportion using the standard normal distribution or the t distribution
4. calculate and interpret test statistics for one-tailed and two-tailed tests of population means, chi-square tests of independence, and regression
5. understand the analysis of data, problem solving, and deductive reasoning (the process of reasoning from premises to a conclusion).

Required texts: *Business Statistics*, Downing and Clark, 5th ed. 2009; *Statistics with Microsoft Excel*, 5th ed., 2013, Beverly Dretzke.

Class sessions: The class sessions will be part lecture and part discussion. You should prepare to discuss the issues in the readings before you come to class. Be prepared to ask and answer questions in class. You are welcome to make audio or video recordings of class for later review.

Learning: Here is the process you should follow to learn from this course:

1. read the material in the reading assignment before coming to class
2. take careful notes in class
3. think about the material in class and answer the teacher's questions
4. ask questions in class
5. review your notes after class
6. work on the current practice assignment
7. review practice assignment answers and ask questions at the review session (the day before each exam)
8. discuss the practice assignment, class notes, and readings with your study group
9. take the exam (3 preliminary exams will be given)
10. review the exam answers
11. review all 3 preliminary exams, readings, and assignments with your study group before the final exam
12. take the final exam

Excel during class Occasionally we will be using Excel to perform calculations in class, either using your laptop or using the desktop computers in the classroom.

Study Groups: The class will be divided into study groups of four or five people. If you know the people you would like in your group, then sign up together; if not, groups will be formed randomly. You are encouraged to meet with your group to study for the exams.

Grading: The requirements for the course are:

- three preliminary examinations (worth 100 points each)
- a final examination (worth 200 points)
- an Excel problem portfolio (worth 30 points)
- an issue summary (worth 20 points)
- a summary of the insurance/portfolio simulation (worth 20 points)

There are 570 total points possible for the course. The course grading scale is:

A: 542; A–: 513; B+: 479; B: 439; B–: 405; C+: 371; C: 342; C–: 314;
D: 285

Here is the grading scale for the 100 point exams:

A: 95; A–: 90; B+: 84; B: 77; B–: 71; C+: 65; C: 60; C–: 55; D: 50;

Exams: The exams will focus on calculation questions; the practice assignments will give you an idea of the kinds of questions that will be asked. Be sure to bring a calculator to each exam. There will also be some short answer questions where you need to write a word, a sentence, or a paragraph.

You are allowed to use your own notes and class handouts during exams.

Bring your completed practice assignment to each exam.

Makeup examinations can be arranged only by advance written notice in case of illness or other acceptable emergency. You may not take more than one makeup exam. No early examinations will be given.

Insurance business / portfolio allocation simulation: In class we will set up an insurance company to insure against the risk of missing class. Students will be both customers and shareholders for this business. Write a one-page summary of your strategy for the simulation and email to *ddowning@spu.edu* at the end of the quarter.

Excel portfolio: During the quarter there will be a few spreadsheet problems for you to set up in Excel. At the end of the quarter email these spreadsheets to *ddowning@spu.edu*. Send them all as attachments in a single email (due on the last day of the quarter). Keep copies of your spreadsheets so you will be able to show a portfolio of your work to potential employees.

Statistics issue summary: Write a one or two-page summary of a news article of your choice related to one of these topics: (1) opinion polls; (2) television or radio ratings; (3) statistical analysis of tests of new medicines; (4) financial portfolio risk analysis; (5) insurance actuarial data; (6) regression analysis applied to real estate by Zillow; (7) advanced statistical analysis of sports performance (such as sabermetrics); or (8) studies of global poverty reduction methods using randomized control trials (see the book *More than Good Intentions*). Email the summary to *ddowning@spu.edu* by the last day of the quarter.

Email: You are required to have an email address through SPU. If you use another email address, then arrange to have your SPU email forwarded to that address. I will try to respond to email by the end of the next school day, but because I receive so much email I can't always guarantee this. If you haven't heard back from me after a few days then send me another message.

Course Evaluation: You are expected to participate in an online evaluation of this course in a thoughtful and constructive manner. The evaluation data is used to make improvements in the course, and your feedback is considered when selecting textbooks, designing teaching methods and preparing assignments. Courses are evaluated using the Banner Course Evaluation System. All answers are completely confidential - your name is not stored with your answers in any way. In addition, your instructor(s) will not see any results of the evaluation until after final grades are submitted to the University.

Attendance: Class attendance is expected. You should contact the teacher in advance (by phone or email) if you must miss class for any reason. If you miss class, you need to see another student to receive notes and handouts for that day. Do not ask the teacher for any handouts for days you missed.

Disabilities: Students with disabilities need to contact Disabled Student Services in the Center for Learning to request academic accommodations.

Integrity: A note to the very small minority of you who might be considering cheating: Any form of academic dishonesty (including copying exam answers from another student or submitting a paper copied from another source without attribution) is a serious offense and can be expected to result in a failing grade for the course.

Snow: Call 281-2800 to determine if snow has caused a change in the class schedule.

About Douglas Downing: My mother attended SPU and I grew up in the Seattle area. As a student at Yale I was president of the Yale InterVarsity Christian Fellowship and manager of the Ivy-League champion football team while completing two majors: economics/political science and astronomy/physics. I earned a Ph.D. from Yale in economics. I also write adventure math textbooks. I have volunteered to teach astronomy to elementary school students. My wife Lori and I met at the Camlann medieval fair near Carnation. I have been one of the leaders for the study abroad UCOR 2000 course in China (Beijing and Wuhan) in September.

Schedule

BusStat= Downing and Clark book; ExcelStat = Beverly Dretzke book

1. **Polls and the Population Proportion** Jan 4
BusStat ch 1
2. **Descriptive Statistics** Jan 9
Raw data, averages, and standard deviations
pivot tables
BusStat ch 2
ExcelStat ch 4, ch 5
(review ExcelStat ch 1, ch 2, ch 3 if you need
to review the basics of Excel)
3. **Probability properties** Jan 9 - Jan 11
BusStat ch 4, ch 5
4. **The binomial distribution** Jan 16 - Jan 18
Risk and insurance
BusStat ch 6, ch 7
ExcelStat ch 6 section 1
- Examination I: Jan 23**
5. **The normal distribution** Jan 25 - Jan 30
the central limit theorem
ways of knowing: quantitative reasoning
BusStat ch 8
ExcelStat ch 6 section 2
6. **confidence intervals** Feb 1 - Feb 6
the margin of error for a poll
BusStat ch 11, 12
- Examination II: Feb 8**
7. **Hypothesis testing** Feb 13 - Feb 15
quality control
BusStat ch 13, ch 14, ch 15
ExcelStat ch 7, ch 8, ch 9 section 1, ch 11
8. **Relationships and regression** Feb 20 - Feb 27
BusStat ch 9, 16, 17
ExcelStat ch 12
- Examination III: Mar 1**
9. **Data analysis / review** Mar 6 - Mar 8
- Final Examination: Friday, March 16, 8am**