

**Syllabus for
(2pm) Correlation and Regression - EDP 382K
Unique Number: 10573
Fall, 2013**

Course Description:

This course is designed for students to master correlation and regression techniques. This class will focus on helping students learn how to

- 1) Identify when to use correlation and regression techniques,
- 2) Understand associated assumptions and how to test them,
- 3) Make the appropriate inferences,
- 4) Describe and discuss correlation and regression and associated inferences.

Pre-requisites:

Mathematical/Statistical skills: This course requires the use of several intermediate level mathematical/statistical skills and understanding. Students are required to have successfully completed an *Introduction to Statistics* graduate course as well as a graduate course on *Experimental Design & Statistical Inference* (including ANOVA and associated topics: not a research design course but a statistics-based course). Equivalent graduate level courses can be approved by the instructor.

Computer programs: Some examples of the use of SPSS will be given during class time but students will also be expected to calculate many of the statistics by hand (or calculator) and thus to master use (and interpretation) of the relevant formulas. Note that there are many different versions of SPSS available and they might look somewhat different (from my version and thus differ somewhat from the screenshots in the course overheads and from each other's versions). However, as these versions change, you will have to be flexible about figuring out where to find the relevant SPSS functions.

SPSS can be purchased on campus. More information about SPSS and purchasing it can be found at: <http://ssc.utexas.edu/software/software-information#spss>. There are also computers in some of the labs in the Learning Technology Center in the College of Education with SPSS installed on them. Students are not required to use SPSS, however, if a student uses another statistical software program, then they are responsible for ensuring the correspondence between procedures and estimation techniques that are used.

Calculator: Students must have access to a calculator that can be used to perform the relevant mathematical functions (such as taking the natural log, the exponent, square root, etc.). Students will need to use the calculator during class time – both during lectures and for in-class exams.

Class-time distractions: Do not text, surf the internet, check Facebook, email, etc. during class time as this distracts both you and students seated around you. Please turn off the volume on your cell phones when in class unless you have a reason that you might need to keep the volume on (child- or elder-care emergencies, etc.).

Meeting time and location:

Days: Tuesday and Thursday
Place: SZB 432

Time: 2pm – 3:30pm

Note: Please do not arrive late as that is disruptive to those of us who have arrived on time.

Instructor:

Name: Dr. Tasha Beretvas **Office:** SZB 538E
Office hours: Thursdays, 10-11:30am, and by appointment.
E-mail: tberetvas@austin.utexas.edu

Note: Do not call me. I don't answer my office phone. Use email for correspondence.

My apologies but I will definitely be **unavailable** to meet with students on the following days due to prior professional commitments (9/19-9/23; 10/10-10/12; 10/14-10/18).

Be sure to contact **BOTH** the TAs and me **by email** if you cannot meet with us during our scheduled office hours and would like to schedule another appointment.

Teaching Assistants:

Name: Danny Swan
Office hours: Monday, 1-2:30pm
Wednesday, 9-10:30am
and by appointment
E-mail: dswan@utexas.edu

Name: Meredith Sibley
Office hours: Wednesday, 3-4:30pm
Friday, 1-2:30pm
and by appointment
E-mail: meresibley@yahoo.com

Informal Review sessions:

Fridays with Danny, 11am-noon
Tuesdays with Meredith, 3:30-4:30pm Location: SZB 538N

Course Materials

Required: Two textbooks have been selected to supplement material presented in class, namely: *Correlation and Regression: Applications for Industrial Organizational Psychology and Management* (Bobko) and *Applying Regression & Correlation: A Guide for Students and Researchers* (Miles & Shevlin). References to pages in the texts that correspond to topics covered in class are provided in the **Topics** handout. The texts provide some information not covered in class and similarly some material is covered in class that might not be mentioned in the texts. The student is responsible for material covered in class. Students may choose to read the selections either before or after the class sessions, whichever better helps them solidify their learning.

Optional: Class handouts matching the overheads used by the instructor will be made available on CANVAS (<http://canvas.utexas.edu>) to students by 10:30pm on the

day before class. I update overheads to match class progress and thus cannot offer them any earlier. Please do not ask me to post them earlier!!

Reading the handouts does not provide the student with the learning experiences nor the materials equivalent to those obtained by attending class. The handouts provide a skeleton of what is being covered each day and will thus be an incomplete version of the material actually covered. They are designed so that the students can pay attention without scribbling down everything that's being said. The handouts contain spaces for the student to fill in the additional material and to practice working through examples that are provided in class.

Assessments

This course is designed with the hope that students recognize the need to become actively involved with the material to improve their mastery thereof. There are many and frequent assignments but they are designed to provide students with the *practice* necessary for them to become fluent in this subject area. The only way to master correlation and regression techniques (as is the case with most mathematical topics or techniques) is to *use* them. Thus, each of the assignments is designed to provide students with the opportunity to *apply* these techniques.

There will be two types of assessments during the semester (performance on which will contribute to students' final grade) including:

- Portfolio of Correlation and Regression Research Questions (**10%**)
- In-class exams (**90%**)

In addition, homework/practice assignments will be offered for additional practice although performance on these assignments will not be directly factored into students' grades. (Obviously, however, students who work successfully on and learn from these assignments will likely perform better on the graded assessments!). Solution of ungraded assignments will be discussed during weekly Review sessions.

Portfolio of Correlation and Regression Research Questions

As consumers of this course, each student inevitably brings their own unique applied, substantive area of interest. Application of the techniques mastered in this class to students' specific substantive research area should prove useful to students' understanding of the relevance and importance of these techniques and should help students master the material far more than watching the instructor's demonstrations using possibly irrelevant examples.

For almost every statistic covered in this course, students will construct a portfolio entry. For each portfolio entry, a rubric detailing what is required and a worked example will be provided. Basically, for each concept, the assignment will involve students constructing research questions in their own area of research interest that can be "answered" using the statistical concept of interest. Students will name and briefly describe the variables of interest, detail the relevant relationship of interest, the statistical analysis to be conducted, make up (or use actual) data, calculate statistics that would

result and interpret the resulting values. Portfolio entry assignments and due dates are given out **during class**. Dates for the entries are selected based on class progress.

Exams

Exams tend to “motivate” students to thoroughly review course material and provide students with additional practice. The three equally weighted (i.e., each will be 30% of the final grade) in-class exams (on **October 1st**, **October 31st** and **December 5th**) will consist of conceptual, computational and application questions. Students must bring a calculator to the exams. To relieve test anxiety and approximate a more authentic environment in which researchers have access to reference materials, students will be given a formula sheet for use during exams. The exams are not open-book because summary of learning should be accomplished before, not during, the exam. The dates of these exams will not change. Time permitting, Exam Review sessions will be offered during the immediately preceding class period.

Homeworks

Watching the instructor perform calculations can result in the illusion of understanding. Only by running analyses themselves can students ensure their mastery of the material. Computational and interpretation practice will be provided in the form of (ungraded) homeworks. These assignments will be posted on Canvas along with suggested completion dates. Each assignment will be discussed in the weekly Informal Review sessions.

Informal Review sessions

Mastery of statistics requires the same pattern of practice and review as I’ve observed needed for mastery of foreign languages. Thus, in an effort to encourage students to have a chance to review and to provide students with a chance to hear the material reviewed by someone other than the instructor, two one-hour *Informal Review sessions* will be offered every week. One of the TAs will lead each of these sessions each week. These *Informal Review* sessions are intended to focus on the previous week’s material including discussion of concepts and additional problems for students to work through. If a homework assignment is “due”, then the TAs will offer students time to discuss the problems during the review session. These sessions will be offered at the following days and times: Tuesdays, 3:30-4:30pm and Fridays, 11am-noon in SZB 538N.

Makeup Assignments:

Only in exceptional circumstances (including a verifiable medical excuse) and only with **prior** permission from the instructor will students be able to hand in an assignment late. Without this permission, the student will be penalized for late work. For each 24-hour period that the assignment is delayed, 10% will be deducted from the assignment’s score. Because assignments are due at the beginning of class, each 24 hour period will start coincident with the class’s beginning. Thus if an assignment is due, for example, at 2pm on Tue, 9/3 but is handed in at 1:59pm on Thu, 9/5, then 20% will automatically be deducted from the student’s score on the assignment. There will be no exceptions to this penalty.

If a student becomes ill on the day that a portfolio assignment is due, it is the student's responsibility to contact the instructor and to arrange delivery of the assignment by the time it is due. In this case, if the assignment is not complete, then the student will receive credit only for what was attempted. It is important to complete assignments **before** the day on which they are due. If the student becomes ill on the day of an exam, then it is the student's responsibility to ensure the instructor is contacted to notify them, provide them with a doctor's note and to re-schedule the exam.

Grading System:

Grades are assigned based on percentage of accumulated points:

A : 93-100; *B+*: 86-89; *C+*: 76-79; *D*: 60-69; *F*: 0-<60
A-: 90-92; *B* : 83-85; *C* : 73-75;
 B-: 80-82; *C-*: 70-72;

Attendance:

Students are responsible for all material presented in lectures. It is expected that students will attend lectures, however, attendance will not be taken. If a student misses a class, then regardless of the reason for class being missed the ***student is responsible*** for obtaining both the course material that was missed as well as any class announcements from his/her classmates.

Students are expected to arrive ***on time*** for the beginning of class. Students anticipating late arrival should notify the instructor before class. A pattern of tardiness can negatively affect your grade. Assignments are due at the beginning of class on the due date specified with the assignment. If a student cannot attend on the days when an in-class assignment is due, then the student is responsible for notifying the instructor ***in advance*** and arranging timely delivery of the assignment or completion of an alternative assignment.

We **do not accept emailed** assignments.

Religious holy days sometimes conflict with class and examination schedules. It is the policy of The University of Texas at Austin that you must give your instructors sufficient notification prior to the classes scheduled on dates you will be absent to observe a religious holy day. If a student has to miss an assignment due to a religious holy day, it is the student's responsibility to consult the instructor to re-schedule another deadline for the assignment.

Please note the dates of the exams. Class will not be held on Thanksgiving Day (November 28th).

Scholastic Dishonesty Policy:

The University defines academic dishonesty as cheating, plagiarism, unauthorized collaboration, falsifying academic records, and any act designed to avoid participating honestly in the learning process. Scholastic dishonesty also includes, but is not limited to, providing false or misleading information to receive a postponement or an extension on a test or other class assignment, and submission of essentially the same written assignment for two courses without the prior permission of faculty members.

By accepting this syllabus and participating in this course, you have agreed to these guidelines and *must* adhere to them. Students who violate University rules on scholastic dishonesty will receive an F for the course grade, be referred to the appropriate university officials, and may receive a maximum penalty of suspension or even expulsion from the University. To find a copy of the UT Honor Code (or statement of ethics) and an explanation or example of what constitutes plagiarism go to the following link:

<http://registrar.utexas.edu/catalogs/gi09-10/ch01/index.html>

Disability Accommodation

Any student with a documented disability who requires academic accommodations should contact the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259, <http://www.utexas.edu/diversity/ddce/ssd/>

Communication

In this course [e-mail](#) will be used as a means of communication with students. You will be responsible for checking your e-mail regularly for class work and announcements. Do **NOT** leave me a **phone** message in my office because I do NOT check my voicemail. I do, however, check email several times a day on ***weekdays*** (during regular working hours). Also, please note that portfolio assignment due dates are distributed during class time.

You will also be responsible for checking the Canvas course site regularly for announcements, and copies of my overheads. As with all computer systems, there are occasional scheduled downtimes as well as unanticipated disruptions, so plan accordingly.

Safety

Recommendations regarding emergency evacuation can be obtained from the Office of Campus Safety and Security, 512-471-5767, <http://www.utexas.edu/safety/>.

- Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.
- Familiarize yourself with all exit doors of each classroom and building you enter. Remember that the nearest exit door may not be the one you used to enter.
- Students requiring assistance in evacuation should inform their instructor in writing during the first week of class.
- In the event of an evacuation, follow the instruction of faculty or class instructors.
- Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.
- Link to information regarding emergency evacuation routes and emergency procedures can be found at: www.utexas.edu/emergency

Correlation & Regression, Fall, 2013
 EDP 382K - Unique number: 10570 and 10573
Very, Very Tentative Schedule of Topics

Date:	Topic	M&S	Bobko
Thu 8/29 & Tue 9/3	<u>Course Introduction</u> <u>Statistics Review</u> <ul style="list-style-type: none"> • Scales of Measure • Mean • Measures of variability • Z-scores • Sampling distributions, standard errors • Logic of hypothesis testing, p-values, power, Types I and II error, test statistics • Confidence intervals 	p. 1-9 p. 58-60	p. 6-11, and any previous Stats texts
Thu 9/5 & Tue 9/10	<u>Pearson's Correlation, r:</u> <ul style="list-style-type: none"> • Covariance • Correlation – assumptions, formula, SPSS • Scatterplots • Restriction of range • Unit of analysis • Outliers 		p. 12-30
Thu 9/12 & Tue, 9/17 & Thu 9/19	<u>Statistical significance of r:</u> <ul style="list-style-type: none"> • $H_0: \rho = 0$, practical significance • Confidence interval for ρ • $H_0: \rho = c$, using Z_r • $H_0: \rho_1 - \rho_2 = 0$, for independent ρ_1 and ρ_2 • $H_0: \rho_1 - \rho_2 = 0$, for dependent ρ_1 and ρ_2 • Statistical significance of elements of matrix of rs 		p. 43-58, p. 60-63
Tue 9/24	<u>Other Measures of Association</u> and tests of their statistical significance <ul style="list-style-type: none"> • Spearman • Phi coefficient • Point-biserial • Biserial 		p. 30-39
Thu 9/26	REVIEW		

Tue 10/1	<u>Exam 1</u>		
Thu 10/3	<u>Testing univariate assumptions</u>	p. 61-84	
Tue 10/8	<u>Simple Linear Regression</u> <ul style="list-style-type: none"> Relationship between correlation and regression Derivation of equations 		p. 118-157
Thu 10/10	<u>Simple Linear Regression (cont'd)</u> <ul style="list-style-type: none"> LS criterion, Residuals, Standard error of estimate, SPSS Confidence Intervals 		p. 118-157
Tue 10/15	<u>Correlations between more than two variables</u> <ul style="list-style-type: none"> Multiple correlation Partial correlation Semi-partial correlation 		p. 168-174
Thu 10/17 & Tue 10/22 & Thu 10/24	<u>Multiple Regression</u> <ul style="list-style-type: none"> Model, Test of model parameters Beta weights Adjusted R^2 / shrinkage Cross-validation Multicollinearity Suppression Coding of predictors 	p. 27-34 p. 45-57	p. 177-204, p. 252-254, p. 255-261
Tue 10/29	REVIEW		
Thu 10/31	<u>Exam2</u>		
Tue 11/5 & Thu 11/7	<u>Moderating Variables</u>	p. 40-57 p. 165-191	p. 218-233
Tue 11/12 & Thu 11/14	<u>Mediating Variables</u>	p. 165-191	
Tue 11/19	<u>Comparison of nested regression models</u>		
Thu 11/21	<u>Cross-validation</u>	p. 34-39	

Tue 11/26	<u>Regression model assumptions</u> <u>Power</u>	p. 84-112	
Thu 11/28	<i><u>Thanksgiving</u></i>		
Tue 12/3	REVIEW		
Thu 12/5	<u>Exam 3</u>		

Note 1: Exams are scheduled on 10/1, 10/31 and 12/5. These dates are **NOT** tentative.

Note 2: This list of topics is tentative and subject to change based on class progress.