# EDP 382K: CORRELATION & REGRESSION (3 CREDITS)
# FALL 2014 (Unique #: 10905)

## General Information
Lecture meeting time: Thursday, 12:30pm – 3:15pm.
Location: George I. Sanchez Building (SZB), Room 435

Instructor:          Jodi Casabianca, Ph.D.
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Office:           SZB 538G
Office hours:      Wednesday, 3:00pm-5:00pm *in SZB 352A*; by appointment

Teaching Assistant:  Mishan Jensen, M.Ed.
Email:           mishanjensen7@gmail.com
Office:           Learning Technology Center (LTC; SZB, Room 536)
Office Hours:      Monday, 12:00pm-2:00pm

## Course Description
This course covers topics in correlation and regression methods. As a student in the class, your goals are to: (a) learn how to identify when to use correlation and regression techniques, (b) understand associated assumptions and how to test them, (c) make the appropriate inferences, and (d) describe and discuss correlation and regression and associated inferences. The course will involve a combination of lecture, data analysis demonstrations, and assessments to help you meet these learning goals.

## Prerequisites
To gain entrance into the course, you must have either successfully completed EDP 380E (Fundamental Statistics) or passed the proficiency examination.

## Required Textbooks and Materials

*Textbooks*.  There are two required textbooks for the course. Miles and Shevlin (2001) is available at the reserve desk at the PCL. Bobko (2001) may also become available at the reserve desk in the beginning of the semester.

Bobko, P. (2001). *Correlation and regression: Applications for industrial organizational psychology and management*. Sage Publications.   (ISBN: 978-0761923039)

Miles, J., & Shevlin, M. (2001). *Applying regression and correlation: A guide for students and researchers*. Sage Publications.   (ISBN: 978-0761962304)

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.  You are responsible for material covered in class. You may choose to read the selections either before or after the class sessions, whichever better helps you solidify your learning. I highly suggest at least scanning the readings before the class session to prepare yourself for what will be presented in class. Everyone learns differently, but from my own experience doing a full reading *before* and *after* class should almost guarantee your success in understanding the concepts.

***Class Handouts.*** 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.

***Calculator.*** You will be required to calculate many of the statistics by hand to master the use (and interpretation) of the relevant formulae. Therefore, you will need your own calculator to perform relevant mathematical functions (such as taking the natural log, the exponent, square root, etc.) during class and exams. Because you will need your calculator during exams, do not intend to share calculators or use your cell phone's calculator function/app.

***Statistical Software/SPSS.*** In research and practice, analysts do not compute statistics manually, they use statistical software. I will provide examples of how to use SPSS (a point-and-click statistical software) in class using screenshots.

You will need to use statistical software to complete your homework assignments (described below). Although you are not required to use SPSS for your assignments, it is to your advantage because this is what will be discussed in class and provided in course materials. If you use another statistical software program, then you are responsible for ensuring the correspondence between procedures and estimation techniques that are used.

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://www.utexas.edu/its/products/spss/purchase.php. There are also computers in the some of the labs in the College of Education with SPSS installed on them.

## Assessments
Your course grade will be a combination of your performance on portfolio assignments (25%) and three in-class examinations (75%).

***Portfolio of Correlation and Regression Research Questions.*** How do you get to *Carnegie Hall*? → Practice, practice, practice!!! Your diligence in applying the methods discussed in class is imperative to achieving the four goals listed under the course description. Therefore, a portion of your course grade will be based on your performance on portfolio entries.

For almost every statistic covered in this course, you 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. **Please work alone on your portfolio assignments.**

Portfolio entry assignments and due dates are given out ***during class***. Dates for the entries are selected based on class progress. 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. ***Emailed assignments will not be accepted***.

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 coincidently with the class's beginning. Thus if an assignment is due, for example, at 12:30pm on Thursday, 9/4 but is handed in at 12:29pm on Mon, 9/9, then 40% 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.

***Exam Dates and Policies.***  There will be three examinations; the dates of these exams shown below will not change.

Exam dates
Exam 1:      October 2
Exam 2:      October 30
Exam 3:      December 4

Examinations will consist of conceptual, computational and application questions. Students must bring a calculator to the exams. Examinations are not open-book, but you may use one 8.5" X 11" two-sided page of notes during the exam to reduce test anxiety.

***Exams cannot be made-up unless your absence is excused via doctor's note or prior arrangement because of religious holiday observance. 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. In the case of a religious holiday observance, University policy requires students to notify each of their instructors as far in advance of the absence as possible so that arrangements can be made.***

***Ungraded Homework Assignments.***  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. These assignments will not be reviewed in class, but if you should have questions after reviewing the solutions posted online, please visit office hours to review them.

## Grading Policy

Your final course grade will be assigned based on the conversion from numeric course grade to letter grade as shown in the below table. Unless there was a computational error in your grade computation, grades will not be changed after the end of the semester.

| | | | |
|---|---|---|---|
| A : | $\geq 93$ | C+: | 76-79 |
| A-: | 90-92 | C: | 73-75 |
| B+: | 86-89 | C-: | 70-72 |
| B: | 83-85 | D: | 60-69 |
| B-: | 80-82 | F: | <60 |

## Canvas

All electronic materials used for this course will be available on Canvas. Grades for all examinations and assignments will also be available on Canvas. Please access the training for students (http://edutech.ctl.utexas.edu/students/) for help with setting up your account and navigating the system. 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.

**DO NOT EMAIL ME OR MISHAN IN CANVAS. Please use the UT email system.**

## Communication Policy

All students should become familiar with the University's official email student notification policy. The complete text of this policy and instructions for updating your email address are available at **http://www.utexas.edu/its/help/utmail/1564** .

Students are expected to check email on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. In this course, email 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. I check email several times a day on **_weekdays_** (during regular working hours).

Email communication is to be used for scheduling meetings and asking "quick" yes/no questions. **_Please do not email me or Mishan with questions that require more than a quick yes or no answer._** Please reserve your deeper questions for office hours, as face-to-face communication is the best method for extensive explanations.

Please note that portfolio assignment due dates are distributed during class time, not via email.

**Attendance Policy**
You are responsible for being present in class and for all lecture and written material covered in class, even if you miss a class. If a student misses a class, then <u>regardless of the reason for class being missed</u> the ***student is responsible*** for obtaining both the course material that was missed as well as any class announcements from his/her classmates. While attendance is not part of your grade, you will be better prepared to complete assignments and examinations if you regularly attend class.

**Accommodations for Religious Holidays**
Notify me of your pending absence at least fourteen (14) days prior to the date of observance of a religious holy day. If you must miss a class, an examination, an assignment in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

**Documented Disability Statement**
Any student with a documented disability who requires academic accommodations should contact Services for Students with Disabilities (SSD) at (512) 471-6259 (voice) or 1-866-329-3986 (video phone).  Faculty are not required to provide accommodations without an official accommodation letter from SSD. Also please notify me as quickly as possible if the material being presented in class is not accessible (e.g., text on presentation slides too small, etc.).

**Policy on Academic Integrity**

*University of Texas Honor Code.*  The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

A fundamental principle for any educational institution, academic integrity is highly valued and seriously regarded at The University of Texas at Austin. More specifically, you and other students are expected to maintain absolute integrity and a high standard of individual honor in scholastic work undertaken at the University. This is a very basic expectation that is further reinforced by the University's Honor Code. At a minimum, you should complete any assignments, exams, and other scholastic endeavors with the utmost honesty, which requires you to:
  * acknowledge the contributions of other sources to your scholastic efforts;
  * complete your assignments independently unless expressly authorized to seek or obtain assistance in preparing them;
  * follow instructions for assignments and exams, and observe the standards of your academic discipline; and
  * avoid engaging in any form of academic dishonesty on behalf of yourself or another student.

*On Working Together for Assignments.* You are encouraged to study together and to discuss information and concepts covered in class with other students. You can give "consulting" help to or receive "consulting" help from such students.  However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else. Should copying occur, both the student who copied work from another student and the student who gave

material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Code can also be extended to include failure of the course and University disciplinary action.

*On Exams.* During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

**Tentative Course Schedule**
This schedule may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected. *Exam dates will not change*.

| Date | Session Topic |
|---|---|
| 8/28/2014 | Course Introduction<br>Statistics Review |
| 9/4/2014 | Pearson's Correlation, *r* |
| 9/11/2014 | Statistical Significance of *r* |
| 9/18/2014 | Statistical Significance of *r*<br>Other Measures of Association |
| 9/25/2014 | Testing Univariate Assumptions<br>*Review* |
| 10/2/2014 | **Exam 1**; Simple Linear Regression |
| 10/9/2014 | Simple Linear Regression<br>Correlations Between More Than Two Variables |
| 10/16/2014 | Multiple Regression |
| 10/23/2014 | Multiple Regression<br>*Review* |
| 10/30/2014 | **Exam 2**; Moderating Variables |
| 11/6/2014 | Moderating Variables (continued)<br>Mediating Variables |
| 11/13/2014 | Mediating Variables (continued)<br>Comparison of Nested Regression Models |
| 11/20/2014 | Cross-validation<br>Regression Model Assumptions<br>Power<br>Review |
| 11/27/2014 | *Thanksgiving* |
| 12/4/2014 | **Exam 3** |

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**Course Topics and Corresponding Reading Assignments**

| Topic | M&S | Bobko |
|---|---|---|
| Statistics Review:<br>• Scales of Measurement<br>• Mean<br>• Measures of variability<br>• Z-scores<br>• Sampling distributions, standard errors<br>• Logic of hypothesis testing, p-values, power, Types I and II error, test statistics<br>• Confidence Intervals | p. 1-9<br>p. 58-60 | p. 6-11 |
| Pearson's Correlation, *r*:<br>• Covariance<br>• Correlation – assumptions, formula, SPSS<br>• Scatterplots<br>• Restriction of range<br>• Unit of analysis<br>• Outliers | | p. 12-30 |
| Statistical Significance of *r* | | p. 43-58<br>p. 60-63 |
| Other Measures of Association and Tests of Their Statistical Significance:<br>• Spearman<br>• Phi coefficient<br>• Point-biserial<br>• Biserial | | p. 30-39 |
| Testing Univariate Assumptions | p. 61-84 | |
| Simple Linear Regression:<br>• Relationship between correlation and regression<br>• Derivation of equations<br>• LS criterion, residuals, standard error of the estimate, SPSS<br>• Confidence Intervals | | p. 118-157 |
| Correlations Between More Than Two Variables:<br>• Multiple correlation<br>• Partial correlation<br>• Semi-partial correlation | | p. 168-174 |
| Multiple Regression:<br>• Model<br>• Test of model parameters<br>• Beta weights | p. 27-34<br>p. 45-57 | p. 177-204<br>p. 252-254<br>p. 255-261 |

| | | |
|---|---|---|
| • Adjusted $R^2$/shrinkage<br>• Cross-validation<br>• Multicollinearity<br>• Suppression<br>• Coding of predictors | | |
| Moderating Variables | p. 40-57<br>p. 165-191 | p. 218-233 |
| Mediating Variables | p. 165-191 | |
| Comparison of Nested Regression Models | TBA | |
| Cross-validation | p. 34-39 | |
| Regression Model Assumptions | p. 84-112 | |
| Power | TBA | |