**Psychology in Education 2410**

**Applied Regression Analysis**

**School of Education, University of Pittsburgh**

**Fall Term 2019**

Wednesday 4:30-7:10 pm

5405 WWPH (Posvar Hall)

Instructor: Xu Qin ([xuqin@pitt.edu](mailto:xuqin@pitt.edu))

Office Hour: 11:00 am – 12:00 pm, Wednesday

Office: 234 McKee Pl, Room 216

Teaching Assistant: Shangmou Xu (SHX23@pitt.edu)

Office Hour: TBD

Office: TBD

***Course Overview:***

This course covers topics related to simple and multiple linear regression, including model specification and assumptions, methods of estimation, significance tests of model parameters and various types of multiple regression and predictor-selection techniques. The relationship of partial and semi-partial correlation to regression is covered as well as the use of interaction terms and dummy variables in regression. Multiple regression for dichotomous outcome variable, logistic regression is also introduced.

The course will be predominantly lecture format, with details on how to use SPSS software for all statistical analyses. The course will serve two purposes: a) convey sufficient knowledge and skill regarding regression techniques to enable students to apply these procedures properly in their own research, and b) lay the foundation for more advanced studies in multivariate analysis, structural equation modeling, and multilevel modeling.

***Prerequisites***

PSYED 2018 or an equivalent introductory statistics course which covers descriptive statistics, correlation analysis and simple linear regression, and statistical hypothesis testing.

***Textbook:***

Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003). Applied multiple regression/correlation analysis for the behavioral sciences, 3rd edition. Mahwah, NJ: LEA.

***Course Documents:***

Lecture slides and handouts will be made available before each class on CourseWeb (<http://courseweb.pitt.edu>). **Please print out and bring a copy of the lecture slides and handouts before coming to class.** The lecture slides uploaded before class are the preview version with the parts to be discussed in class emptied out. They will be replaced with the full version after class. **You are not allowed to use any electronic products in this class.**

***Software:***

Statistical computing is an integral part of PSYED 2410. We will use SPSS, a copy of which can be obtained from the PITT download center (<http://software.pitt.edu/>). I assume that each of you has used SPSS to perform statistical analyses at least once in the past. If not, please see me for introductory materials of SPSS. It is fine if you prefer to use other statistical software (e.g., SAS, STATA) for your assignments.

***Homework Assignments:***

There will be a homework assignment associated with every lecture. Homework exercises will assess knowledge of both theoretical principles and application methods. All homework assignments will be posted on CourseWeb. All assignments will be handed at the beginning of lecture on the listed due date (See course calendar).

* Collaborations are encouraged. Please understand that each student must turn in individual homework assignments, not group work. Papers should be written in your own words – your text should reflect your understanding of the material. **Students who submit group homework assignments will be given zeros.** *To properly acknowledge the contribution of your collaborators, please indicate on the cover page of each assignment the names of the people with whom you worked.*
* Because homework solutions are made available after the homework is turned in, **late homework will not be accepted**. In a valid emergency appropriate accommodations will be made. It is best, if possible, to contact the instructor prior to the due date.
* Your homework should be neat and well-organized. Show your work and circle your answers. The grader is a student like you and will not take time to decipher poor handwriting, put pages in order, or read notes scrawled in the margins. You may type your assignments.
* Be sure to print your name at the top of the first page of your assignment. Put your name or initials at the top of each additional sheet of paper or computer output. Staple your pages together.

***Additional Practice:***

To get prepared for every lecture, especially if you have not had a lot of prior experience with statistics, you should read the appropriate sections (listed on the last page) from the textbook **before** class. You are strongly encouraged to ask questions in class.

There are exercises/problems at the end of each chapter in the textbook, and you are strongly encouraged to go over them carefully **after** class. You may not need to do all of the exercises, but you should do as many of them as you can (or need).

***Midterm and Final Examinations:***

There will be one midterm exam and one final exam. Exams will assess knowledge of both theoretical principles and application methods. Each exam will be closed book however you will be permitted to use a single two-side 8.5x11 sheet of paper. If you’ll miss an exam, let me know as soon as possible.

***Grading:***

You will be evaluated on the basis of your class participation (5%), weekly assignments (40%), midterm examination (25%), and the final exam (30%).

Letter grades will be based on actual points earned as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Point | Letter |  | Point | Letter |
| ≥ 93 | A |  | 77 - < 80 | C+ |
| 90 - < 93 | A- |  | 74 - < 77 | C |
| 87 - < 90 | B+ |  | 70 - < 74 | C- |
| 84 - < 87 | B |  | 67 - < 70 | D+ |
| 80 - < 84 | B- |  | 64 - < 67 | D |
|  |  |  | 60 - < 64 | D- |
|  |  |  | <60 | F |

## *Academic Integrity:*

Please make sure you read the university guidelines on Academic integrity (http://www.pitt.edu/~provost/ai1.html). Attention to this policy is particularly important in a course like PSYED 2018, in which collaboration with other students is encouraged. If, for instance, you work closely with other students during the planning, execution, or interpretation of your data analyses – a process that I encourage and fully support – you should make sure that the other students’ contributions are recognized explicitly in your written account. If you have any questions about what constitutes appropriate collaboration, or how to define what constitutes your own work, please see me.

### *Special Accommodation:*

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 140 William Pitt Union, (412) 648-7890/(412)383-7355 (TTY), as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course.

**Course Outline** (subject to change)

| **Week** | **Date** | **Topic** | **Reading** | **Assignment**  **Due** |
| --- | --- | --- | --- | --- |
| 1 | 08/28/2019 | Review of basic statistical concepts  Correlation | Chapter 2 |  |
| 2 | 09/04/2019 | Simple Linear Regression (I) | Chapter 2 | Assignment 1 |
| 3 | 09/11/2019 | Simple Linear Regression (II) | Chapter 2 | Assignment 2 |
| 4 | 09/18/2019 | Multiple Linear Regression (I) | Chapter 3  (3.1 – 3.4) | Assignment 3 |
| 5 | 09/25/2019 | Multiple Linear Regression (II) | Chapter 3  (3.5 – 3.6) | Assignment 4 |
| 6 | 10/02/2019 | Diagnostics (I) | Chapter 4 | Assignment 5 |
| 7 | 10/09/2019 | Diagnostics (II)  Midterm review | Chapter 10  Chapter 6  (6.1, 6.2) | Assignment 6 |
| 8 | 10/16/2019 | **In-class midterm exam** |  |  |
| 9 | 10/23/2019 | Review of midterm exam  Model building | Chapter 5  (5.3 – 5.5) | Assignment 7 |
| 10 | 10/30/2019 | Categorical independent variables | Chapter 8  (8.1 – 8.3, 8.5) | Assignment 8 |
| 11 | 11/06/2019 | Interaction with categorical variables | Chapter 9 | Assignment 9 |
| 12 | 11/13/2019 | Interactions among continuous variables  Mediation and Power Analysis | Chapter 7  Chapter 3 (3.7)  Chapter 5 (5.6) | Assignment 10 |
| 13 | 11/20/2019 | Logistic Regression | Chapter 13 (13.1 – 13.2) | Assignment 11 |
| 14 | 11/27/2019 | No Class |  |  |
| 15 | 12/04/2019 | Missing Data  Final Review |  | Assignment 12 |
| 16 | 12/11/2019 | **In-class final exam** |  |  |