

**NEW YORK UNIVERSITY  
ROBERT F. WAGNER GRADUATE SCHOOL OF PUBLIC SERVICE**

**PADM-GP 2902: REGRESSION AND INTRODUCTION TO ECONOMETRICS  
Spring 2015**

**FACULTY INFORMATION***Professors:*

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**LECTURES**

Sec 1: Wed. 11 am–12:40 pm BOBS LL150	Sec 2: Tues, 11:00 am–12:40 pm 25W4 C-20	Sec 3: Tues, 4:55–6:35 pm TISC LC11
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**STATA TUTORIALS**

In addition to a video tutorial posted to *NYU Classes*, there are two *optional* in-person tutorials:

1. January 29, 2015, 12 Waverly Place, Room G08, 7pm-9pm
2. February 4, 2015, Meyer 121, 7pm-9pm

The dates, time, and location of the tutorials are based on course enrollment and room availability. *We recommend that you bring a laptop with Stata installed, and ask that students who bring a laptop allow their classmates without a laptop to follow along with them.*

**RECITATIONS (PADM-GP 290)**

You are required to register for recitation. Attendance is optional but highly recommended. In these sessions you will discuss the learning objectives of the problem set (and some specific questions) that is due the following week. As time allows, TCs will also answer follow-up questions from the week's lecture and Stata.

Section 001: Wednesday, 8:35-9:35 pm, Tisch LC19 (McNeil)

Section 002: Friday, 12:35-1:35pm, Tisch LC19 (Benn)

Section 003: Thursday, 8:35 p.m. – 9:35 p.m. Tisch LC19 (Salkinder)

## TUTORING

We also offer free optional tutoring from the teaching colleagues at Puck in the Study.

Monday, 8:45-9:45 p.m. (McNeil)

Thursday, 1:00-2:00 p.m. (Salkinder)

Thursday, 5:00 p.m. – 6:00 p.m. (Benn)

**PREREQUISITE:** CORE-GP 1011 or equivalent

## NYU CLASSES

You will need to have access to the NYU Classes found under “Academics” on your NYU Home site (<https://home.nyu.edu/>). All announcements and class related documents (problem sets, computer exercises, databases, solutions, optional exercises, class notes, etc.) will be posted here.

## COURSE DESCRIPTION

Multiple regression (econometrics) is the core statistical technique used by policy and finance analysts in their work. In this course, you learn the theory and practice of econometric analysis. Specifically, you learn how to evaluate whether regression coefficients are biased, whether standard errors (and thus t statistics) are valid, and whether regressions used in policy and finance studies support causal arguments.

In addition, employing one consistent dataset for all your computer exercises, you perform statistical analyses discussed in class using Stata, an econometric statistical package, and you see how the results reflect econometric concepts. Finally, with a group of your classmates and project datasets provided by your professors, you do a project that involves estimating your own regression model and applying the techniques we learn in class.

**COURSE REQUIREMENTS AND GRADING**

1. **(20%) Fifteen problem sets and computer exercises. There are 100 possible points for each problem set (PS) and for each computer exercise (CE).**
  - a) Thus the grades on all your problem sets and computer exercises will be added, divided by 15 (or 13 after two are dropped – see c. below) and multiplied by 0.2.
  - b) Computer exercises will be graded for effort to complete the entire exercise; problem sets will be graded for content. **Copying others or previous semesters will result in a zero.**
  - c) We will drop the two lowest grades, but no zeros (not handed in) will be dropped.
  - d) Answers to problem sets and computer exercises **must be submitted at the beginning of the class for which they are listed in the course schedule below and in hard copy.** No late assignments or emailed assignments will be accepted.
  - e) For Stata output, submit only the last “run” of the analysis. For problem sets, submit your answers on the answer sheet provided for each set. Write your mailbox number on your submissions. Graded assignments will be returned to your student mailbox.
  - f) Solutions will be posted to *NYU Classes* on Wednesday afternoons.

**2. (35%) Exam (100 possible points)**

An in-class exam will be given during **Class 10** (see Course Schedule below). You may bring a non-graphing calculator and two pages (single-sided) of notes.

**3. (45%) Group Project (100 possible points)**

In groups of four to five, you will conduct a regression analysis, present your results, and write a paper. (**Note:** All group members will complete peer evaluations that will factor into grades.)

- a) **As a PDF (and not a word document),** email me your 2902 project form by Saturday January 31 at 6:00 pm with your rankings of preferred data sets and I will put you in groups. See datasets and their descriptions in *NYU Classes, Resources, Project Descriptions and Datasets*. **The project form is at the end of the syllabus but when you fill it out you will then have to make it a pdf before sending to me.**
- b) Contact me to meet with your group the week of **Class 3 or Presidents’ Day week (Thursday or Friday)** to discuss the project, including at least one specification that will be estimated.

- c) Read chapter 11, “Running Your Own Regression Project,” in the course text.
- d) See me during office hours or after class for quick check-ins on your work.
- e) Contact me **by the week of class 11**, to go over your two tables (descriptive statistics and results) with your group. In addition, see me about your results as you go along if you want or need feedback.
- f) Present your results during one of the last three class sessions to get feedback before writing. **Note:** All students are expected to attend each day of presentations.
- g) Write an 8-10 page paper, including two tables, organized into five sections as follows below, under *Paper Outline*. Tables do not count in page limit.

### *Paper Outline*

- I. Introduction: What is the goal of your regression study? Why is it interesting? Why do we care? (This does not have to be momentous – but you should explain why the results could be interesting or valuable to someone.)
- II. Data: Describe your sources and discuss the descriptive statistics that are presented in Table 1.
- III. Model and Empirical Strategy: What is your model (equation), and how does it achieve the goal of your analysis? Why are the specific variables used and measured as they are? Do you have any prior expectations about the signs of coefficients? How will you estimate this model? (Usually OLS with fixed effects.)
- IV. Results: Discuss the results that are presented in Table 2.
- V. Conclusions: What does your model say about your goal or issue? What is the next step in this research?

Appended at end of paper:

- i) Table 1 (with title): Descriptive statistics of all the variables in your model(s).
- ii) Table 2 (with title): Results of your models, presented in four or five columns.
- iii) Final cleaned up, annotated Stata log file of your results.

## COURSE MATERIALS

1. **Required:** A. H. Studenmund, *Using Econometrics: A Practical Guide*, 6<sup>th</sup> ed, cited as S. ISBN: 0131367730.

2. **Required:** Stata/IC 13, purchased and loaded onto your computer by week one.

You should purchase this software here in order to obtain a student discount:

<http://www.stata.com/order/new/edu/gradplans/gp-direct.html>.

Purchase Stata/IC 13 (**not** Small Stata). The least-cost option is a 6-month license, at \$69. If you are planning to take Estimating Impacts, Advanced Empirical Methods, or the Research Capstone, you may want to consider a one-year or perpetual license. Stata 13 is not platform-dependent and will run on either Windows or Mac operating systems.

No previous knowledge of Stata is necessary. In addition to learning Stata through the problem sets and computer exercises and in class, the Data Services Studio in Bobst (<http://library.nyu.edu/dataservice/>) offers short courses (tutorials) and on-site help.

3. **Required:** **Computer Exercises and Data Set** to download from *NYU Classes*. See the course schedule below for when assignments are due in class.

By the first week of class, **download** from *NYU classes, resources, problem sets, computer exercises and solutions by class due, assignments by class due, class three*, saving them to a folder on your computer reserved for PADM-GP 2902 work:

Computer Exercises all one file.doc;  
newschools9810.dta;  
Class 3 Exercise 2014.do;

Then, **watch the video** on using Stata (on *NYU Classes, Stata Learning Materials*).

## CLASS NOTES

Before each class, class notes will be available on *NYU Classes*. *You should print them, bring them to class*, and use them to organize your notes. **Download** Class 1 Handout new.

**SUMMARY OF COURSE GRADING AND DUE DATES**

1. 20% Problem Sets and Computer Exercises
2. 35% Midterm Exam
3. 45% Regression Project

**COURSE SCHEDULE (S= Studenmund text)**

<b>CLASS</b>	<b>Tues. Wed.</b>	<b>READING</b>	<b>DUE IN CLASS (Hard copy, no late assignments)</b>	<b>COVERED IN RECITATON</b>
<b>1</b>	1/27 1/28	S Chs. 1 & 2 (34-38 & 46-57)	See "Class Topics," next pg	Problem Set 2
<b>2*</b>	2/3 2/4	S Chs. 2 (39-45) & 4	Problem Set Class 2 <b>(due class 2 and so on in this column)</b>	Problem Set 3
<b>3</b>	2/10 2/11	S Chs. 3 & 5 (not including appendix)	Problem Set Class 3 Computer Exercise Class 3	Problem Set 4
	2/17 & 2/18	<b>NO CLASS: Presidents' Day plus Tuesday and Wednesday off</b>		
<b>4**</b>	2/24 2/25	S Chs. 6 & 7 (207-213, 218-220, 223-226); Appendix Ch. 5	Problem Set Class 4	Problem Set 5
<b>5</b>	3/3 3/4	S Ch. 7 (213-218, 220-223, 226-232)	Problem Set Class 5 Computer Exercise Class 5	Problem Set 6
<b>6</b>	3/10 3/11	S Chs. 8 & 9	Problem Set Class 6 Computer Exercise Class 6	Problem Set 7
	3/17 & 3/18	<b>NO CLASS: Spring Break</b>		
<b>7</b>	3/24 3/25	S Ch. 10	Problem Set Class 7 Computer Exercise Class 7	Problem Set 8
<b>8</b>	3/31 4/1	S Ch. 16	Problem Set Class 8 Computer Exercise Class 8	Problem Set 9
<b>9</b>	4/7 4/8	S Ch. 13	Problem Set Class 9 Computer Exercise Class 9	Exam Review
<b>10</b>	4/14 & 4/15	<b>EXAMINATION</b>		
<b>11***</b>	4/21 4/22	S Ch. 14 (396-97) & Table 11-2		Exam Q&A
<b>12</b>	4/28 & 4/29	(Presentations Week)	Computer Exercise Class 11	None
<b>13</b>	5/5 & 5/6	(Presentations Week)		None
<b>14</b>	5/12 & 5/13	(Presentations Week)		None
	5/15		Regression Project Papers	None

\* email me **2902 project form as PDF** (at the end of syllabus) by **Sat. January 31 at 6:00 pm.**

\*\* schedule meeting with me week of **class 3 or week after** to discuss regression analysis and one equation.

\*\*\* schedule a meeting with me week of **class 11** to go over Tables 1 and 2 of projects.

**CLASS TOPICS****Class 1: OLS Bivariate Regression Model with Error Term**

Theoretical regression line; deterministic versus stochastic relationships; population versus sample regression line; error and residual; OLS estimators

**Note:**

- Purchase and install Stata/IC 13;
- Download and save, from NYU Classes:  
*newschools9810.dta*,  
*Class 3 Exercise 2014.do*,  
*Computer Exercises all one file.doc*.
- Watch the video on using Stata, on NYU Classes.
- Print and bring to class: *Class 1 Handout new.doc*

**Class 2: OLS Multiple Regression and Assumptions about Error Term**

Reducing bias; interpretation of coefficients; BLUE assumptions

**Class 3: Hypothesis Testing in Multiple Regression Context**

Significance tests; confidence intervals; F test;  $R^2$ ; Adjusted  $R^2$ ; interpretation of computer output

**Class 4: Functional Form Part I: Polynomials and Dummy Variables**

Functional form; using qualitative data (dummies); joint tests of significance; curvilinear relationships

**Class 5: Functional Form Part II: Interactions and Logarithmic Transformations**

Interactions of dummies; interactions of continuous and dummy variables; continuous by continuous interactions; logarithmic transformations (percent change or elasticity transformations)

**Class 6: Multicollinearity and Autocorrelation****Class 7: Heteroskedasticity****Class 8: Panel Data Estimation Part I**

Pooled cross-sectional and time series data; panel data; fixed effects estimation.

**Class 9: Panel Data Estimation Part II; Introduction to Linear Probability Models****Class 10: Exam****Class 11: Qualitative Dependent Variables; Simultaneous Equation Models****Class 12-14: Presentations**

**Th. May 15: Papers Due in Professor's Mailbox (Puck, 3<sup>rd</sup> Floor) by 5 p.m.**





**PROJECT DATA SET PREFERENCE FORM**

**SEND TO PROFESSOR STIEFEL BY EMAIL IN *PDF FORM***

**2902: Spring 2015**

**Due by Saturday January 31 at 6:00 pm (otherwise you will be put into group by professor)**

**NAME:** \_\_\_\_\_

**SECTION:**

\_\_\_ **Tuesday 11 to 12:40**

\_\_\_ **Tuesday 4:55 to 6:35**

Please number the project data sets from your first (1) to last (6) choice. You can rank as many as you like as your first or second choice etc. *and, importantly*, if you are willing to be put into any group, please check that box. Willingness to go with any group is very helpful!

Rank

\_\_\_ *Willing to be put in any group*

\_\_\_ *School District Finances in Three States Data Set*

\_\_\_ *Early Childhood Longitudinal Survey Data*

\_\_\_ *International (Country) Data Set*

\_\_\_ *State Demographics and Finances Data Set*

\_\_\_ *Health Research Survey Data Set*

\_\_\_ *National Neighborhood Data Set*