

# Syllabus

## STAT W4315

### Linear Regression Models

January, 2016

Meeting Time: TR 4:10PM-5:25PM, Meeting Location: 517 Hamilton Hall

- Instructor: Paweł Polak
  - Office: School of Social Work (SSW), room 928  
(1255 Amsterdam Ave., 9th floor)
  - Office Hours: 4:00 PM - 6:00 PM Friday (by appointment made by email)
  - E-mail: pp2501@columbia.edu
- Teaching Assistant: TBA
  - Office Hours: TBA
  - E-mail: TBA
- Study Materials
  - *Slides from the lectures*
  - Textbook: *Applied Linear Regression Models* by Michael Kutner, Christopher Nachtsheim, and John Neter
- Additional Readings
  - *Statistical Inference* by George Casella and Roger L. Berger
  - *Econometrics* by Fumio Hayashi
- Software
  - MATLAB: The Language of Technical Computing
  - R: The R Project for Statistical Computing

- Prerequisites: STAT W3107 or the equivalent, MATH V1101, V1102, V2010 or by permission of program advisor. (substituting the prerequisites with other courses requires the explicit permission of the instructor).
- Course Description: In this class we study theory and practice of regression analysis, simple and multiple regression, including testing, estimation, and confidence procedures, modeling, regression diagnostics and plots, polynomial regression, collinearity and confounding, model selection, geometry of least squares. We will cover also shrinkage and selection methods for linear regression (LARS, LASSO, Ridge regression, and ElastNet). This course requires extensive use of the computer to analyse data.
- Grade: 30% homework, 25% midterm exam, 45% final.
- Exams:
  - Midterm: Tuesday, March 8, 4:10PM-5:25PM, 517 Hamilton Hall (in class).
  - Final: Consult Student Services Online for Final Exam Schedule.
- An Important Note: no make-up exams will be given.
- Homework:
  - There will be 7-10 HW assignments.
  - Collaboration is allowed in solving the problems, but each student has to hand in her or his own independently written solutions.
  - Homework must be submitted into the Statistics Homework Boxes room 904 on the 9th floor of SSW building.
  - Homework is due Thursday 12:00 noon.
  - No late homework, under any circumstances, will be accepted. However, at the end of semester, one of your lowest homework scores will be dropped before the final grade is calculated.
  - HW cannot be submitted to your TA by e-mail.
  - Please do not contact the TA or the grader directly concerning your grades.
  - Please write [W4315] in the subject heading of all e-mail correspondence with instructor/TA. (This is in general effective in weeding out spam email.)
  - The TA may not be responsible for the homework component of the class.
  - Please note that mathematics/statistics questions by email will not be answered due to the lack of an appropriate interface. You are encouraged to ask your technical questions during office hours.

- As the TA has responsibilities other than W4315 please go to them only during office hours (unless prior arrangements have been made.)
- To be fair to the TA and your fellow students please do not unnecessarily burden the teaching team with unreasonable requests. Please be responsible and plan ahead if you have to be away from campus during the semester.
- Course prerequisite cannot be unilaterally overridden. Note again substituting the prerequisites with other courses requires the explicit permission of the instructor. In keeping with past policy for the course, permission to use substitutes for prerequisites requires formal hard copy documentation (academic transcript + syllabus.) The process of obtaining explicit permission of the instructor needs to be done in person and not through email. Please come to office hours regarding this, as requests for exemption are reviewed carefully and granted on a case-by-case basis, and thus needs to be done in person. Hence permission to take W4315 cannot be given by email as there is a formal procedure to be followed. Academic transcripts and syllabus are submitted to the instructor and officially documented (in hard copy.) Hence please do not send attachments with syllabus/academic transcripts by email, please bring these printouts to the office hours. website within few days.
- Columbia University Honor Code  
 The Columbia University Student Council, on behalf of the whole student body, has resolved that maintaining academic integrity is the preserve of all members of our intellectual community including and especially students. As a consequence, all Columbia College students will now make the following pledge: We, the undergraduate and graduate students of Columbia University, hereby pledge to value the integrity of our ideas and the ideas of others by honestly presenting our work, respecting authorship, and striving not simply for answers but for understanding in the pursuit of our common scholastic goals. In this way, we seek to build an academic community governed by our collective efforts, diligence, and Code of Honor. In addition, all Columbia College students are committed to the following honor code: I affirm that I will not plagiarize, use unauthorized materials, or give or receive illegitimate help on assignments, papers, or examinations. I will also uphold equity and honesty in the evaluation of my work and the work of others. I do so to sustain a community built around this Code of Honor.
- Faculty Statement on Academic Integrity  
 The intellectual venture in which we are all engaged requires of faculty and students alike the highest level of personal and academic integrity. As members of an academic community, each one of us bears the responsibility to participate in scholarly discourse and research in a manner characterized by intellectual honesty and schol-

arly integrity. Scholarship, by its very nature, is an iterative process, with ideas and insights building one upon the other. Collaborative scholarship requires the study of other scholarswork, the free discussion of such work, and the explicit acknowledgment of those ideas in any work that inform our own. This exchange of ideas relies upon a mutual trust that sources, opinions, facts, and insights will be properly noted and carefully credited. In practical terms, this means that, as students, you must be responsible for the full citations of others ideas in all of your research papers and projects; you must be scrupulously honest when taking your examinations; you must always submit your own work and not that of another student, scholar, or internet agent. Any breach of this intellectual responsibility is a breach of faith with the rest of our academic community. It undermines our shared intellectual culture, and it cannot be tolerated. Students failing to meet these responsibilities should anticipate being asked to leave Columbia.