

NYU SOCIOLOGY MATH/STATS REFRESHER

FALL 2017

Lecture Tue-Fri 9:30am-noon, Conference Room, Puck Bldg.
Instructor Mike Hout & Siwei Cheng (Sociology faculty)

Lab Tue-Fri 2:00pm-3:30pm, Conference Room.
Instructor Gerard Torrats-Espinosa (PhD candidate)

COURSE DESCRIPTION

The idea behind this mandatory course is to make sure that you all have a basic foundation in several areas that we feel are essential for quantitative research, with the hope that this will make the introductory statistics course and subsequent methods course in the spring run more smoothly. The course will lead directly into the introductory statistics course that is required in the fall.

TENTATIVE SCHEDULE OF TOPICS/CONCEPTS

Day 1: Introduction to Mathematics in Social Science Research - *Cheng*

1. Basic notations
2. Arithmetic principles
3. Algebraic principles
4. Equations
5. Functions
6. Introduction to calculus I - limits, derivatives, minimum, maximum

Day 2: Probability and Introduction to Calculus- *Cheng*

1. Counting rules
2. Operations on sets
3. Calculation of probability
4. Conditional probability
5. Independence
6. Random variable
7. Probability distributions
8. Introduction to calculus II - integrals

Day 3: Linear Algebra- *Cheng*

1. Vectors and matrices
2. Transpose of a matrix, identity matrix, triangular matrix
3. Matrix addition
4. Scalar multiplication and matrix multiplication
5. Matrix inverse
6. Matrix and linear transformation
7. Matrix and network analysis
8. Matrix and social mobility tables

Day 4: Descriptive Statistics and Graphical Display of Data- *Hout*

1. Describing statistical distribution
2. Data visualization

COMPUTATIONAL RESOURCES

STATA

- The Statistics and Social Sciences Group, ITS in Bobst Library. In addition to workshops on STATA and other software, you can email them for consultation with questions on research methods and statistical analysis: data.service@nyu.edu
- Online STATA resources available at this UCLA statistics site: <http://www.ats.ucla.edu/stat/stata/>

L^AT_EX

- L^AT_EX (often pronounced as LAH-tek or LAY-tek) is a document preparation system. It is widely used in academia for the communication and publication of scientific documents in many fields.
- To get started on installing and using L^AT_EX, you can go to the online resources at the UCLA statistics site: <http://www.ats.ucla.edu/stat/latex/>.
- If you do not want to install L^AT_EX on your computer, you can use an online LaTeX editor, such as [ShareLaTeX](#), which allows online compiling of projects to PDF format. ShareLaTeX has a free version with which you can create, edit, and save your own LaTeX documents.