

# DGA 506: Quantitative Methods for Global Affairs

## Fall 2014

### Professor Jun Xiang

Class: Thursday 10am-12:40pm

Office Hours: Tuesday 1-3pm

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## Course Description

In this course, students are introduced to data analysis, statistical inference, and research design relevant to global affairs research. Topics covered will include variable measurement, descriptive statistics, confidence intervals, hypothesis tests, correlation, and regression analysis.

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## Grading

Course grades will be based on homeworks (30%), a closed book midterm exam (35%), and a closed book final exam (35%).

There will be about 5 homeworks, and students have 2 weeks to finish each homework assignment. Homeworks are due at the beginning of class on the day specified. Late homeworks will be penalized 20% per day (i.e., you will receive a grade of zero after 5 days).

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## Textbooks

The following textbooks are **required**:

- Alan Agresti and Barbara Finlay, *Statistical Methods for the Social Sciences* (4th edition).

This is the main textbook for the course.

- John Verzani, *SimpleR: Using R for Introductory Statistics*.

This is a free PDF about R, the computer program we'll be using for statistical analysis.

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## Statistical Program: R

In this course, we will learn how to use the R program for statistical analysis. I will spend some time teaching programming in R. In addition, students will be required to complete some parts of their homeworks using the R program.

R is free, so you may want to install it on your own computer. To do so, you can download R from the following site:

- [Comprehensive R Archive Network \(CRAN\)](#). This is the original and most up-to-date version of R. Towards the top of the page is a section titled “Download and Install R.” Select your operating system (Mac, Windows, Linux) and follow the links.
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## Course Outline

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### 1 Course Introduction (9/4)

- Agresti & Finlay, chapter 1.
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### 2 Basics of Data Analysis (9/4–9/11)

Topics: Variables & Measurement, Sampling & Surveys, Descriptive Statistics, Mean, Variance

- Agresti & Finlay, chapters 2–3.
  - HW 1: (9/11)
- .....

### 3 Probability (9/18)

Topics: Probability Basics, Discrete & Continuous Variables, Normal Distribution

- Agresti & Finlay, sections 4.1–4.3.
- .....

## 4 Estimation and Inference (9/25–10/2)

Topics: Sampling Distributions, Central Limit Theorem, Estimators & Their Properties, Confidence Intervals

- Agresti & Finlay, sections 4.4–4.7, 5.1–5.4, 5.6.
  - HW 1 due (9/25)
  - HW 2: (9/25)
- .....

## 5 Hypothesis Tests (10/9)

Topics: Hypothesis Tests, Type I and II Errors

- Agresti & Finlay, 6.1–6.5.
  - HW 2 due (10/9)
  - HW 3: (10/9)
- .....

## 6 Comparing Two Groups (10/16)

Topics: Difference of Means, Difference of Proportions

- Agresti & Finlay, sections 7.1–7.4.
- .....

## 7 Midterm Exam (10/23)

- HW 3 due (10/23)
- .....

## 8 Crosstabs & Association (10/30)

Topics: Cross-Tabulations, Goodness of Fit, Chi-Square Test, Measures of Association

- Agresti & Finlay, chapter 8
  - HW 4: (10/30)
- .....

## 9 Correlation and Bivariate Regression (11/6–11/20)

Topics: Linear relationships, Correlation, Bivariate Regression, Regression Assumptions

- Agresti & Finlay, chapter 9.
  - HW 4 due (11/13)
- .....

## 10 Multiple Regression (11/20–11/25)

Topics: Multiple Regression,  $R^2$ , F-Test, Dummy Variables, Interaction Terms, Quadratic Terms

- Agresti & Finlay, chapters 10, 11.1-11.6, 13.1-13.4, 14.1-14.3, 14.5.
  - HW 5: (11/20)
- .....

## 11 Final Exam (12/4)

- HW 5 due (12/4)