PP 5331
**Quantitative Methods for Public Policy**
Department of Public Policy

# Syllabus – Fall 2020

**Excluding materials for purchase, syllabus information may be subject to change. The most up-to-date syllabus is located within the course in HuskyCT.**

## Course and Instructor Information

**Course Title: Quantitative Methods for Public Policy**
**Credits:** 3
**Format:** Distance Learning
**Prerequisites:** None
**Professor:** Ruodan Zhang

**Email:** ruodan.zhang@uconn.edu (Please include PP5331 in your email subject line)
**Phone:** 860.325.0461
**Availability**: *I will typically respond to emails within a 24-48-hour time period, excluding weekends. Feedback about written assignments will be provided within a week after the due date.*

## Course Technology

**Class Meeting: Wednesday 5:00 PM – 7:30 PM**
**Webex Meeting Number (access code):** 120 450 4731
**Webex Meeting Password:** uconndpp

**Virtual Office Hours:** Monday 6:00 PM – 8:00 PM, or by appointment
**Webex Meeting Number (access code):** 120 457 3867
**Webex Meeting Password:** uconndpp

**HuskyCT**
See *Course Orientation* in HuskyCT for detailed instructions.

**STATA**
Available on UConn AnyWare

## Course Materials

**Required course materials should be obtained before the first day of class**.

Required textbooks are available for purchase through the UConn Bookstore (or use the Purchase Textbooks tool in HuskyCT). Textbooks can be shipped (fees apply).

**Required Textbooks**

Stock, J. H. & Watson, M. W. (2019). Introduction to Econometrics, 4th Edition. Pearson. ISBN: 9780134461991

*Additional readings will be provided in HuskyCT within the reading folder of each individual session.*

## Course Description

This course is an introduction to the methods and tools used in applied public policy research. The course begins with a short review of fundamental statistical concepts including probability distribution functions, estimators, sampling distributions, and hypothesis testing. It then turns to estimation and inference in the simple and multivariate regression models. Additional topics include functional form in regression models, dummy variables, discrete dependent variables in regression and an introduction to panel data analysis.

## Course Objectives

By the end of the semester, students should be able to:

(1) Formulate statistical models to inform public policy and management;
(2) Apply statistical modeling to public policy and management data sets using STATA or other analytical tools;
(3) Understand statistical inference and its applications in policymaking and management decisions; and
(4) Understand the limitations of regression analysis.

## Course Outline

**Module Plan**

| Module | Week | Topic | Chapter | Deliverables |
|---|---|---|---|---|
| 1 | Aug 31 – Sep 6 | **Introduction to Quantitative Methods for Public Policy** | 1 | |
| 2 | Sep 7 – Sep 13 | **Review of Probability and Statistics**<br>- Random variables and probability distribution functions<br>- Estimators and sampling distribution | 2, 3 | Reading Quiz 1 |

| | | | | |
|---|---|---|---|---|
| | | - Statistical inference: estimation and hypothesis testing<br>- Jointly distributed random variables, covariance and correlation | | |
| 3 | Sep 14 – Sep 20 | **Simple Linear Regression**<br>- Simple linear regression model<br>- Estimation and interpretation<br>- Inference | 4, 5 | Reading Quiz 2<br>Problem Set 1 |
| | Sep 21 – Sep 27 | **In-class Exam 1** | | Exam 1 |
| 4 | Sep 28 – Oct 4 | **Multivariate Regression Analysis**<br>- Multivariate regression model<br>- Estimation and interpretation<br>- Inference | 6, 7.1, 7.5, 7.6 | Reading Quiz 3 |
| 5 | Oct 5 – Oct 11 | **Non-linear Regression Functions**<br>- Functional form<br>- Dummy variables and interaction terms | 8 | Problem Set 2 |
| 6 | Oct 12 – Oct 18<br>Oct 19 – Oct 25 | **Joint Hypothesis Tests and Robust Inference**<br>- Joint hypothesis testing<br>- Robust inference: heteroscedasticity, serial correlation, clustering | 7.2, 5.4, 6.7 | Reading Quiz 4 |
| | Oct 26 – Nov 1 | **In-class Exam 2** | | Exam 2 |
| 7 | Nov 2 – Nov 8<br>Nov 9 – Nov 15 | **Regression with Binary Dependent Variables**<br>- Linear probability model<br>- Probit and logit models<br>- Ordered and multinomial models | 11 | Problem Set 3 |
| 8 | Nov 16 – Nov 21 | **Regression with Panel Data I**<br>- Pooled cross-sectional data<br>- Panel data techniques | 10 | Reading Quiz 5 |
| / | Nov 22 – Nov 29 | *Thanksgiving Recess* | | |
| 8 | Nov 30 – Dec 7 | **Regression with Panel Data II**<br>- Panel data techniques<br>- Robust inference | 10 | Problem Set 4 |
| / | Dec 8 – Dec 13 | *Reading Days* | | |
| / | Dec 13 – Dec 20 | *Final Examinations* | | Final Exam |

*The professor reserves the right to make adjustments in the course calendar as necessary.*

## Course Requirements and Grading

**Summary of Course Grading:**

| Course Components | Weight |
|---|---|
| **Participation** | **5%** |
| **Reading Quizzes** | **5%** |
| **Problem Sets (4)** | **20%** |
| **In-class Exam 1** | **20%** |
| **In-class Exam 2** | **20%** |
| **Final Exam** | **30%** |

### Participation

The extent to which the class is valuable to you will depend much upon your level of involvement in learning. You are expected to manage your own learning process, review the course materials in a timely manner, and participate in class discussions. Failure to make regular and meaningful contributions to class discussions will be result in a reduced final grade.

In particular, as we will have extensive hands-on practice sessions using STATA, speaking in class and asking questions are valuable to you and your colleagues to troubleshoot, and will help you gain confidence in quantitative methods. From time to time, we will have some exercise graded by completion only. It is important that you participate fully in these exercises and submit your work on time.

### Reading Quizzes

Students are expected to complete the readings prior to the class. A copy of lecture notes will be provided on HuskyCT for most sessions. There will be **five** short reading quizzes that relate to various aspects of the reading (see *Course Outline* for the quiz schedule). Each will be worth 1 percent of your grade. These should be completed by each class, typically due on Wednesdays by 5:00 PM ET.

| Reading Quiz | Class Module | Due Date |
|---|---|---|
| 1 | 2 | September 9th 5:00 PM ET |
| 2 | 3 | September 16th 5:00 PM ET |
| 3 | 4 | September 30th 5:00 PM ET |
| 4 | 6 | October 14th 5:00 PM ET |
| 5 | 8 | November 18th 5:00 PM ET |

**Problem Sets**

Four problems sets will be assigned during the semester. These problem sets are designed to prepare you for the exams and allow you to practice and apply the course materials using STATA. The problem sets are labor-intensive, and each will cover materials from multiple class sessions. You are encouraged to start working on the problem sets immediately after a topic is discussed on class. You are encouraged to work with your colleagues; however, you should submit your work individually, and the submitted work will be assessed as work of the individual student. Comprehensive solution sets will be distributed after the problem sets are graded and returned.

| Problem Set | Class Module | Due Date |
|---|---|---|
| 1 | 1, 2 | September 18th 11:59 PM ET |
| 2 | 3, 4 | October 9th 11:59 PM ET |
| 3 | 5, 6 | November 6th 11:59 PM ET |
| 4 | 7, 8 | December 4th 11:59PM ET |

**In-class Exam 1**

The first in-class exam will be **close-book** and will assess your understanding of the course modules 1 and 2. You will have two and a half hours to work on the exam; however, this exam should only take about two hours to finish. The exam will be administered using **Respondus Lockdown Brower**.

The exam is scheduled on **September 23 from 5:00 PM to 7:30 PM ET**, through HuskyCT.

**In-class Exam 2**

The second in-class exam will be **open-book** and will assess your understanding of the course modules 3, 4, and 5. You will have two and a half hours to work on the exam; however, this exam should only take about two hours to finish. You will need to use **STATA** for some exam questions.

The exam is scheduled on **October 28 from 5:00 PM to 7:30 PM ET**, through HuskyCT.

**Final Exam**

The final exam is **open-book** and comprehensive. It will assess your ability to formulate statistical models (Objective #1), to apply the models using STATA (Objective #2), to interpret the results (Objective #3), and discuss the relevant policy implications (Objective #3 & #4). The exam will be available for 24 hours during the final examination week (Dec 13 – Dec 20) and must be submitted within the timeframe. **The exact date is to be confirmed with the whole class.**

**Estimated Out-of-class Workload (14 weeks)**

| Activity | Description | Hours per activity | Total (Hours) |
|---|---|---|---|
| Reading Assignments | On average approximately 60 pages per week | 2 | 28 |
| Reading Quizzes | 5 reading quizzes | 0.5 | 2.5 |
| Problem Sets | 4 problem sets | 5 | 20 |
| Study Hours for Exams | 3 exams | 8 | 24 |
| **Estimated Workload** | | **5.32 out of class hours/week** | |

**Grading Scale**

| Grade | Letter Grade | GPA |
|---|---|---|
| 97-100 | A+ | 4.3 |
| 93-96 | A | 4.0 |
| 90-92 | A- | 3.7 |
| 87-89 | B+ | 3.3 |
| 83-86 | B | 3.0 |
| 80-82 | B- | 2.7 |
| 77-79 | C+ | 2.3 |
| 73-76 | C | 2.0 |
| 70-72 | C- | 1.7 |
| 67-69 | D+ | 1.3 |
| 63-66 | D | 1.0 |
| 60-62 | D- | 0.7 |
| <60 | F | 0.0 |

**Due Dates and Late Policy**

All course due dates are identified in the Course Outline. Late submissions/exams will not be accepted.
Deadlines are based on Eastern Time; if you are in a different time zone, please adjust your submittal times accordingly. Emergencies or exceptional circumstances can be discussed. *The instructor reserves the right to change dates accordingly as the semester progresses. All changes will be communicated in an appropriate manner. All changes will be communicated through HuskyCT Announcements.*

**Feedback and Grades**

I will make every effort to provide feedback and grades within one week from the due date. To keep track of your performance in the course, refer to My Grades in HuskyCT.

**Student Authentication and Verification**

The University of Connecticut is required to verify the identity of students who participate in online courses and to establish that students who register in an online course are the same students who participate in and complete the course activities and assessments and receive academic credit. Verification and authentication of student identity in this course will include:

1. Secure access to the learning management system using your unique UConn NetID and password.

2. Exam administered by Respondus Lockdown Browser.

## Student Responsibilities and Resources

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important standards, policies and resources, which include:

- The Student Code
  - Academic Integrity
  - Resources on Avoiding Cheating and Plagiarism
- Copyrighted Materials
- Netiquette and Communication
- Adding or Dropping a Course
- Academic Calendar
- Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
- Sexual Assault Reporting Policy

## Students with Disabilities

The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or http://csd.uconn.edu/.

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government." (Retrieved March 24, 2013 from Blackboard's website)

## Software/Technical Requirements (with Accessibility and Privacy Information)

The software/technical requirements for this course include:

- HuskyCT/Blackboard (HuskyCT/ Blackboard Accessibility Statement, HuskyCT/ Blackboard Privacy Policy)
- Webex
- STATA
- UConn AnyWare
- Adobe Acrobat Reader (Adobe Reader Accessibility Statement, Adobe Reader Privacy Policy)
- Microsoft Office (free to UConn students through uconn.onthehub.com) (Microsoft Accessibility Statement, Microsoft Privacy Statement)
- Dedicated access to high-speed internet with a minimum speed of 1.5 Mbps (4 Mbps or higher is recommended).

**NOTE:** This course has NOT been designed for use with mobile devices.

## Help

Technical and Academic Help provides a guide to technical and academic assistance.

This course is completely facilitated online using the learning management platform, HuskyCT. If you have difficulty accessing HuskyCT, you have access to the in person/live person support options available during regular business hours through the Help Center. You also have 24x7 Course Support including access to live chat, phone, and support documents.

## Minimum Technical Skills

To be successful in this course, you will need the following technical skills:

- Use electronic mail with attachments.
- Save files in commonly used word processing program formats.
- Copy and paste text, graphics or hyperlinks.
- Work within two or more browser windows simultaneously.
- Open and access PDF files.

University students are expected to demonstrate competency in Computer Technology. Explore the Computer Technology Competencies page for more information.

## Evaluation of the Course

Students will be provided an opportunity to evaluate instruction in this course using the University's standard procedures, which are administered by the Office of Institutional Research and Effectiveness (OIRE).

Additional informal formative surveys may also be administered within the course as an optional evaluation tool.