



ICPSR SUMMER WORKSHOPS AT THE HOBBY SCHOOL

ICPSR Summer Program in Quantitative Methods of Social Research

The Hobby School of Public Affairs will serve as a host of the 2019 Summer Program in Quantitative Methods of Social Research of the *Inter-University Consortium of Political and Social Research (ICPSR)*. ICPSR was launched in 1962 as a national initiative for training social scientists in research methods including mathematical modeling, statistics, data analytics, and experimental design.

ICPSR is hosted at the University of Michigan, and runs its flagship Summer Program in Ann Arbor. The Hobby School joins a selective group of academic institutions in the ICPSR network offering summer training workshops. Other hosts of these workshops include the University of Massachusetts at Amherst, University of California at Berkeley, University of Colorado at Boulder, University of North Carolina at Chapel Hill, University of Utah at Salt Lake City, and the European University Institute. ICPSR also has three international partners: University of Glasgow, Scotland; University of St. Gallen, Switzerland; and York University, Toronto, Canada.

These workshops aim at training students and professionals in the analytical tools and software used in the analysis of data in the social sciences. The Hobby School will offer six short workshops this summer.

1. Linear Regression Analysis in the Social Sciences, five-day workshop, May 13-17
2. Introduction to R (open-source statistical software), three-day workshop, May 13-15
3. Social Science Data and Model Visualization in R, two-day workshop, May 16-17
4. Time Series Cross-Sectional (TSCS) Data Analysis, five-day workshop, May 20-24
5. Maximum Likelihood Estimation, five-day workshop, May 20-24
6. Structural Equation Modeling, three-day workshop, May 22-24

The workshops meet daily from 9:00 a.m. - 5:00 p.m., and include lectures and hands-on lab training on the applications learned in class. Refreshments will be provided in the mornings and afternoons, and there will be a small reception on May 15 and May 22 after the sessions on those days. For more information about the ICPSR Summer Program at the Hobby School, please contact Pablo M. Pinto (ppinto2@uh.edu), Director, Center for Public Policy, or Scott Mason (smason@uh.edu), Program Manager 2 at the Hobby School.

Financial support of up to \$1,000 per workshop is available for eligible students. In order to determine if you qualify for funding, send a personal statement of purpose, letter of recommendation from an advisor/colleague, and a copy of your unofficial transcript to ppinto2@uh.edu and smason@uh.edu. The deadline for submitting this request is **Friday, April 19**.



Workshops Offered at the UH Hobby School of Public Affairs

Linear Regression Analysis in the Social Sciences

Instructors: Sunny Wong, University of Houston (Hobby School of Public Affairs) and Patrick Shea, University of Houston (Department of Political Science)

Dates: May 13-17, 9:00 a.m. - 5:00 p.m.

Room: McElhinney Hall 315

Course Description: This course is designed for participants to develop quantitative research skills with applications to social science topics. Participants will gain an overview of research design, data management, and statistical analysis and interpretations of research findings. The course will be centered around several main topics covering the basic analysis of ordinary least squares (OLS), the technique of estimating bivariate and multivariate regression models, the overall fitness of a regression equation, and the hypothesis and diagnostic testings, and more. This course takes the "learning by doing" approach by discussing the major themes in regression analysis with detailed examples, which show how the subject works in practice using Stata.

Prerequisites: The level of the course will be approximately that of Gujarati and Porter's Basic Econometrics

Software: Stata

Workshop Information: <https://www.icpsr.umich.edu/icpsrweb/sumprog/courses/0253>

Introduction to R

Instructor: Ryan Kennedy, Department of Political Science, University of Houston

Dates: May 13-15, 9:00 a.m. - 5:00 p.m.

Room: McElhinney Hall 108

Course Description: Most students learn to use R piecemeal, by performing tasks similar to what they have already learned in another program like Stata or SPSS. The result is often frustration on the part of both students and professors. This course takes a different approach. Utilizing the "tidyverse" tools, this course shows how writing code in R can be both easy and intuitive. We will cover graphics, data management and modeling, automated updating of tables, replication using markdown, functional programming, and, time permitting, application design. This course is not about repeating in R what students have already learned elsewhere, but to instead become R programmers capable of approaching any new challenge.

Prerequisites: Basic statistics

Software: R and RStudio (installation instructions will be submitted prior to start of workshop)

Workshop Information: <https://www.icpsr.umich.edu/icpsrweb/sumprog/courses/0252>

Social Science Data and Model Visualization in R

Instructor: Boris Shor, University of Houston (Department of Political Science)

Dates: May 16-17, 9:00 a.m. - 5:00 p.m.

Room: McElhinney Hall 108

Course Description: This course will introduce social science students to modern methods of exploring and communicating data to a variety of audiences. The primary tools will be the R statistical programming language, RStudio as a development environment, and the tidyverse family of R packages (especially ggplot2) for visualization. The object will be to enable students to feel confident in descriptively exploring their data, communicating that to scholarly and outside audiences, and communicating inferential results for presentation and paper writing purposes. Throughout, good workflow practices for scientific writing will be emphasized.

Prerequisites: A basic knowledge of R is required, which can be provided by the 3-day R course taught earlier in the week.

Software: R and RStudio

Workshop Information: <https://www.icpsr.umich.edu/icpsrweb/sumprog/courses/0266>

Time Series Cross-Sectional (TSCS) Data Analysis

Instructors: Tse-min Lin, University of Texas at Austin (Department of Government) and Christopher Wlezien, University of Texas at Austin (Department of Government)

Dates: May 20-24, 9:00 a.m. - 5:00 p.m.

Room: McElhinney Hall 116

Course Description: Time series cross-sectional (TSCS) data are data with a cross section of units for each of which there are repeated observations over time. TSCS data have been widely used in social sciences and their use is on the rise. The estimation of models for TSCS data is more complicated than either cross-sectional or time-series analysis, as it must address both unit heterogeneity and temporal dynamics. This course provides an introduction to the techniques of TSCS data analysis. It begins with a consideration of the limits of cross-sectional analysis, the benefits of TSCS, and selected time-series issues, before turning to estimation of linear models with fixed and random effects. It then addresses issues in modelling the time series in TSCS and special regression models, including logistic, event count, and event history. It concludes with a brief comparison of TSCS and multilevel data analysis.

Prerequisites: None

Workshop Information: <https://www.icpsr.umich.edu/icpsrweb/sumprog/courses/0267>

Maximum Likelihood Estimation

Instructors: Ling Zhu, University of Houston (Department of Political Science)

Dates: May 20-24, 9:00 a.m. - 5:00 p.m.

Room: McElhinney Hall 108

Course Description: This workshop introduces participants to a number of generalized linear models, with an emphasis on likelihood-based methods. From survey responses to event occurrences and event counts, political and social science data are nearly always categorized by the limited distribution of the variables we are interested in modeling. In this class we will explore limited-dependent variable models, and how social scientists can make use of these models to test arguments. We will tackle both the theoretical under-pinnings of these models, and the application of these models to real-world political and social data. Students in this class will learn to tackle research questions with regression-style analyses regardless of the distribution of the variables-of-interest. With careful introductions to logistic regression, count models, ordinal and categorical models, simulation, and out-of-sample prediction, participants will emerge with a well-rounded methodological tool kit and well-prepared for observational research of many types.

Prerequisites: A basic statistics course and familiarity with linear regression

Software: R and RStudio

Workshop Information: <https://www.icpsr.umich.edu/icpsrweb/sumprog/courses/0254>

Structural Equation Modeling

Instructors: Jennifer Clark, University of Houston (Department of Political Science)

Dates: May 22-24, 9:00 a.m. - 5:00 p.m.

Room: McElhinney Hall 106

Course Description: Structural Equation Modeling represents one of the most popular and flexible modeling approaches in the social sciences, encompassing a variety of models like linear regression, growth curve modeling, confirmatory factor analysis, and mediation models. This course will introduce participants to latent variable structural equation models (SEMs). It will provide an overview of the statistical theory underlying SEMs and will introduce participants to practical examples. Topics include confirmatory factor analysis, multiple indicator models, model identification, model fit, multiple group models and models for means and intercepts.

Prerequisites: Participants should have a strong background in regression analysis and at least a basic

familiarity with matrix algebra. No prior experience with SEM software is required.

Workshop Information: <https://www.icpsr.umich.edu/icpsrweb/sumprog/courses/0268>

Link to ICPSR Summer Workshop Schedule: <https://www.icpsr.umich.edu/icpsrweb/content/sumprog/schedule.html#!workshops>