Economic, Political and Policy Sciences

**EPPS 6302** Methods of Data Collection and Production (3 semester credit hours) Course examines interview-based and self-administered data collection methods, including mobile web and SMS interviews, and newer data sources such as social media. Concentrates on the effects of different techniques on data quality, including error from measurement, nonresponse and coverage, and assesses trade-offs between these error sources when selecting a particular mode or survey design. (3-0) Y

**EPPS 6311** Research Practice in the Social Sciences (3 semester credit hours) Overview course that introduces students to methods used in the different applied social science disciplines. Reviews how data are commonly produced and analyzed within each, identifies recent methodological trends and areas of application, explores career pathways for social data analytics and research graduates, and indicates directions for more advanced study. (3-0) Y

**EPPS 6313** Introduction to Quantitative Methods (3 semester credit hours) This introductory graduate-level statistics course is geared to the consumption of statistical methods commonly used in social science research. Topics include creating and interpreting graphical and tabular summaries of data, descriptive statistics, basic probability theory, sampling distributions, basic hypothesis testing (t-tests, chi-square tests, and analysis of variance), estimation of population parameters, confidence intervals and correlation. An introduction to regression analysis will also be provided. Topics are supported by computer-supported data analyses. (3-0) Y

**EPPS 6316** Applied Regression (3 semester credit hours) This course provides a survey of the bivariate and multiple regression models estimated using Ordinary Least Squares (OLS), with an emphasis on using regression models to test social and economic hypotheses. This application-focused course presents examples drawn from economics, political science, public policy and sociology, introduces the basic concepts and interpretation of regression models, and basic methods of inference. Topics are supported by computer-supported data analyses. Prerequisite: **EPPS 6313** or **EPPS 7313**. (3-0) Y

**EPPS 6323** Knowledge Mining (3 semester credit hours) Introduces techniques to discover patterns and relationships in large and complex data sets, including web mining. Examines ways to explore, analyze and leverage data and transform them into useful and usable information, including decision trees, association rules, clustering, case-based methods, and data visualization. (3-0) Y

**EPPS 6324** Data Management for Social Science Research (3 semester credit hours) Covers the principles and practical techniques of data cleaning, data organization, quality control, and automation of research tasks. Topics covered will include data types, useful text and math functions, labeling, recoding, data documentation, merging datasets, reshaping, and programming structures such as macros, loops, and branching using Stata and R. The course will also discuss using LaTeX to automate outputting of results and graphics in publishable formats. Prerequisite: **EPPS 6313** or **EPPS 7313** or instructor consent required. (3-0) R

**EPPS 6342** Research Design II (3 semester credit hours) This course is the second in a two-course sequence devoted to the study of data development strategies and techniques to facilitate effective statistical analysis. Topics generally covered include: the logic of causal inquiry and inference in the Economic, Political and Policy Sciences, the elaboration paradigm and model specification, anticipating and handling threats to internal validity, hierarchies of design structure (experimental, quasi-experimental and non-
experimental): linking design structure to effect estimation strategies and analyzing design elements in published literature. Students will be required to select a research topic in consultation with the instructor and prepare a written comparative design analysis. Recommended: **EPPS 6310** or **EPPS 6316** or equivalent. (3-0) Y

**EPPS 6346** Qualitative Research Orientation (3 semester credit hours) This course provides a comprehensive understanding of Qualitative Research - its underlying, alternative views of the nature of society and social institutions; placement of the researcher in the research; research methods, including the various main approaches by which to frame, focus, and carry out research - Case Study, Grounded Theory, Phenomenology, Ethnography, and Narrative, along with Content Analysis; benefits and drawbacks of the various approaches; and the scientific contribution of Qualitative Research to social science research, mixed methods research, and public policy. Students are encouraged to relate the research design they create in the course to their qualitative or Mixed Methods dissertation or Masters thesis. (3-0) Y

**EPPS 6347** Qualitative Research Supervision (3 semester credit hours) This course builds upon **EPPS 6346** Qualitative Research Orientation as students use the research design they create in that course, or one created in another course or a newly created design, to conduct interviews, focus groups, observations in the field, or to analyze content of field documents. Prior to this, students use their research design to prepare their IRB application to gain approval to conduct their field research. The instructor will provide individual, hands-on guidance as students prepare their applications and, after gaining approval, as they gather data in the field, analyze, and interpret them. Students are encouraged to conduct research related to their qualitative or Mixed Methods dissertation or Master thesis. Instructor consent required. (3-0) Y

**EPPS 6352** Evaluation Research Methods in the Economic, Political and Policy Sciences (3 semester credit hours) A review of research methods used in program evaluation, with an emphasis on public and nonprofit social programs. Issues to be addressed include research design, appropriate performance standards, measurement and selection of individuals, sampling, data collection, and data analysis. (3-0) Y

**EPPS 6354** Information Management (3 semester credit hours) Focus on design of database applications for commercial, public, and nonprofit organizations. Covers user requirement's analysis, logical database design, physical database design, database query languages, and distributed and client-server databases. Course emphasizes data definition and data manipulation languages for relational data modelling. (3-0) Y

**EPPS 6355** Content Analysis (3 semester credit hours) Content analysis is the art and science of closely studying texts, photographs, videos, and audio soundtracks to extract meanings and other message properties from them. Emphasis is on understanding and applying basic manual and computer-assisted methods, including text mining and semantic analysis, that underpin qualitative and quantitative content analysis research in political science, sociology, economics, public policy, management, and other social sciences. (3-0) Y

**EPPS 6356** Data Visualization (3 semester credit hours) Presents technologies, techniques, and algorithms for creation of effective visualizations of social science data. Examines data wrangling, insight modeling, cognitive science, and graphical communication using SAP Lumira, Tableau, Excel Powerview and D3. (3-0) Y

**EPPS 6359** Social Concepts and Measurement (3 semester credit hours) In this course students will learn the fundamentals of social concepts, measurement theory, and sensitivity analysis. We will study and implement methods and technologies for measuring social concepts, including the construction of scales and typologies, latent traits, content analysis, and survey design. For the course project, students will collect and present a new measure of a social concept. This requires students to justify the need to measure the concept on theoretical grounds, to survey the literature for existing measures of the concept,
to specify how their measure differs and the logic behind their operationalization, and to collect data according to their operational criteria using an appropriate data collection method. Prerequisites: (EPPS 6313 and EPPS 6316) or (EPPS 7313 and EPPS 7316). (3-0) T

**EPPS 7304** Cost-Benefit Analysis (3 semester credit hours) Examines methods for measuring costs and benefits of public projects and policies, and the application of cost-benefit analysis to areas such as economic development, water resources, recreation, transportation, regulation, and the environment. (3-0) R

**EPPS 7313** Descriptive and Inferential Statistics (3 semester credit hours) The course provides a thorough introduction to probability and statistics. Probability topics covered include random variables, expectations, and probability distributions. The heart of the course is a rigorous introduction to statistical inference: sampling theory, confidence intervals, and hypothesis tests. The final section of the course is an introduction to regression analysis, with an emphasis on interpretation of regression results, using examples from recent research. Recommended: one semester of calculus. (3-0) Y

**EPPS 7316** Regression and Multivariate Analysis (3 semester credit hours) This course provides a detailed examination of the multiple regression models estimated using Ordinary Least Squares (OLS), with an emphasis on using regression models to test social and economic hypotheses. Also covered are several special topics in regression analysis, including violations of OLS assumptions, the use of dummy variables, and fixed effects models. The course ends with an introduction to advanced topics in regression analysis, qualitative response models, and non-OLS approaches to estimation. Topics are supported by computer-supported data analyses using application-specific software. Prerequisite: **EPPS 7313**. (3-0) Y

**EPPS 7318** Structural Equation and Multilevel (Hierarchical) Modeling (3 semester credit hours) An introduction to structural equation modeling (SEM) and multilevel modeling (MLM), sometimes called hierarchical linear or mixed modeling. SEM represents a general approach to the statistical examination of the fit of a theoretical model to empirical data. Topics include observed variable (path) analysis, latent variable models (e.g., confirmatory factor analysis), and latent variable SEM analyses. MLM represents a general approach to handling data that are nested within each other or have random components. Topics include dealing with two-level data that may be cross-sectional, such as students within classes, or longitudinal, such as repeated observations on individuals, firms or countries. Recommended prerequisite: **EPPS 7316** or equivalent. Prerequisite: **ECON 6306** or **ECON 6309** or **EPPS 6316** or instructor consent required. (3-0) R

**EPPS 7344** Categorical and Limited Dependent Variables (3 semester credit hours) This course examines several types of advanced regression models that are frequently used in policy analysis and social science research. The key similarity of these models is that they involve dependent variables that violate one or more of the assumptions of the Ordinary Least Squares (OLS) regression model. The main models examined in the course are binary logit and probit, multinomial logit, ordinal probit, tobit, and the family of Poisson regression models. All these models are estimated using maximum likelihood estimation (MLE). The Heckman correction for selection is also addressed. Recommended: **EPPS 6316** or the equivalent. (3-0) Y

**EPPS 7368** Spatial Epidemiology (3 semester credit hours) Examines the conceptual and analytic tools used to understand how spatial distributions of exposure impact processes and patterns of disease. Emphasizes the special design, measurement, and analysis issues associated with spatial patterns of diseases. Contemporary diseases of public health importance are addressed, and the statistical and inferential skills are provided that can be used in understanding how spatial patterns arise and their implications for intervention. Prerequisite: **EPPS 6313** or equivalent. (3-0) R
**EPPS 7370** Time Series Analysis I (3 semester credit hours) This course considers several important topics for applied time series analyses of social science and public policy data including the specification and testing of Box-Jenkins ARIMA models and dynamic regressions. Other topics include stationarity and unit root tests, cointegration and error correction models, autoregressive conditional heterogeneity (GARCH) models and introductions to vector autoregression (VAR) and state space models. Students learn how to use modern software such as Eviews, R, RATS and Stata to do time series analyses. Recommended: **EPPS 7316** or equivalent. (3-0) R

**EPPS 7371** Time Series Analysis II (3 semester credit hours) This course introduces intermediate and advanced methods for the analysis of social science time series data. After reviewing core time series concepts such as stationarity and cointegration, the course considers topics such as vector autoregression and vector error correction models, simultaneous equation and structural time series models, regime switching models, non-Gaussian and nonlinear models, and state space representations. Both frequentist and Bayesian approaches to modeling time series processes are employed. Data analyses are implemented using widely available software packages such as R, RATS and Stata. Prerequisite: **EPPS 7370** or instructor consent required. (3-0) R

**EPPS 7386** Survey Research (3 semester credit hours) This course exposes students to the use of survey methods in social science research. Emphasis is placed on interview and questionnaire techniques and the construction and sequencing of survey questions. Attention is also devoted to sampling theory, sampling and non-sampling errors, and the use of recent advances in fieldwork to reduce measurement error in surveys. Recommended: **EPPS 6313** or equivalent. (3-0) R

**EPPS 7390** Bayesian Analysis for Social and Behavioral Sciences (3 semester credit hours) This course covers the theory and application of Bayesian statistics for economic, political, and other social science data. Students will learn how maximum likelihood and Bayesian estimation are related and how the latter is used to develop decision based inference. Topics include subjective probability, general linear models, posterior simulation methods, model specification and averaging, and sensitivity analysis. Prerequisite: **EPPS 7316** or equivalent. (3-0) R

**EPPS 7V81** Special Topics in Social Science Research Methodology (1-9 semester credit hours) May be repeated for credit as topics vary (9 semester credit hours maximum). (3-0) R