IVAN ALLEN COLLEGE

Statistics/ Econometrics/ Methods Course Offerings at Georgia Tech

	Intro Methods	
	Intro Statistics	
	Intermediate Stats	
Course Number	**Course**	**Description**
Economics		
ECON 6121 -	Research Methods	Introduces students to issues related to conducting research in economics. Topics include the derivation of empirical models from theoretical constructs, causality, experimental and non-experimental data, hypothesis testing, and policy analysis. Students also become familiar with electronic data sources and retrieval and are introduced to several professional software packages.
ECON 6130 -	Quantitative Meth-Econ	This course covers fundamental quantitative tools used in economic and econometric analysis, which includes topics in differential calculus, optimization, and linear algebra.
ECON 6140 -	Probability & Statistics	This course gives students the necessary background for taking courses in the econometrics sequence. Topics include descriptive statistics, continuous and discrete probability distributions, parameter estimation, one- and two-sample hypothesis testing, and bivariate regression models.
ECON 6150 -	Cost Benefit Analysis	The application of economic, financial, and quantitative reasoning and tools to issues of resource allocation and policy, primarily in the public sector.
ECON 6160 -	Econometric Analysis	This course introduces advanced econometric methods on estimation and testing, including instrumental variable estimation, panel data analysis, limited dependent variable models, and simultaneous equation system. The course emphasizes applications of these techniques to real-world problems using professional software packages.
ECON 6161 -	Econometric Modeling	This course introduces techniques on economic and business forecasting, focusing on regression analysis and ARIMA models. Testing for unit roots and cointegration are also discussed. Professional software packages for forecasting are used in applications.
ECON 6162 -	Discrete Choice Econ	Focuses on econometric methods for which the dependent variable represents an "either-or" choice. Included in the set of topics are binary and multinomial logic, ordered choice, heteroskedastic extreme value, bivariate and multivariate probit, nested logit structures, discrete/continuous, and Poisson models. The course includes numerous applications using professional software programs.
ECON 7022 -	Econometrics I	This course is a comprehensive introduction to mathematical statistics principles underlying statistical analyses in economics. It covers probability theory, expectation, sampling, asymptotic results, the main families of probability distributions studied in economics, estimation and hypothesis testing.
ECON 7023 -	Econometrics II	Linear and nonlinear regression analyses, hypothesis testing, ordinary and generalized least squares, instrumental variables estimation, the generalized method of moments, the method of maximum likelihood, methods for stationary time series, unit roots and cointegration, and specification testing
ECON 7025 -	Empirical Res Methods	Topics include up-to-date theory for data analysis, including time series, cross section and panel, and empirical applications using panel data, time series data and cross-sectional data.
History, Technology and Society		
HTS 7001 -	Sociohistorical Analysis	Introduces key concepts and methods used in the historical analysis of social phenomena.
International Affairs		
INTA 6003 -	Empirical Research Meth	This course introduces research methods in international affairs. It emphasizes writing research proposals, empirical techniques, gathering and assembling data, and methods for analyzing and reporting results.
INTA 6004 -	Model,Forecast&Decision	This course introduces modeling and forecasting in strategic decision making, analysis of long-term developments, path gaming, formal analysis of games, and simulation.
Public Policy		
PUBP 6112 -	Research Dsgn-Polcy Sci	The objectives for this course include: (1) providing a broad overview of research methods and research criteria; (2) giving students the opportunity to conduct data-based research and analysis; (3) providing more specialized knowledge of one set of research techniques (e.g. survey research, case studies, experimentation - varies by term); (4) providing experience in presenting and defending research.
PUBP 6114 -	Applied Policy Methods	This course will focus on how to design, carry out, present, and interpret quantitative analyses, of policy problems. Topics include probability, inferential statistics, regression analysis, general linear models, nonparametric analyses and graphical analysis, as time permits. Classes will focus on (1) the course project, (2) discussions of assigned readings and problems, and (3) data analysis using spreadsheets and a standard statistical package. Note: Students without preparation in basic statistical concepts and computer methods will be required to take appropriate courses at the 4000 level prior to admission.
PUBP 6218 -	Quantitative Models-Pubp	This course lays a foundation for model building, and through the introduction of a variety of software packages will provide some hands-on experience with elementary model- building. Decision models will be emphasized. Some familiarity with data analysis, probability, and statistical models is assumed. The goal of the course is to equip students with basic model building tools, familiarize them with common problems in modeling, and improve their ability to create and evaluate simple models of policy problems.
PUBP 6221 -	Pol & Program Evaluation	Approaches to evaluation policies and programs are presented using examples and case studies to contrast evaluation methods as well as the organizational and political context for evaluation.
PUBP 8200 -	Adv Research Methods I	The course will cover advanced policy analysis and modeling methods, including regression models, and other topics as time permits.
PUBP 8205 -	Adv Research Methods II	Building on Advanced Research Methods I, the course will cover advanced policy analysis and modeling methods, for example, panel data and nonparametric regression. Other policy research methods may be explored as time permits.

Psychology		
PSYC 6018 -	Research Design	Introduction to basic principles and practices of empirical research in psychology. Covers both experimental and correlational methods and designs.
PSYC 6019 -	Statistical Analysis I	Introductory treatment of descriptive and inferential statistics as applied to psychological research.
PSYC 6020 -	Statistical Analaysis II	Introductory treatment of inferential statistics, especially the general linear model, as applied to psychological research.
PSYC 7301 -	Multivariate Statistics	Foundations for multivariate analysis including properties of linear composite variables, multiple regression, multiple and partial correlation, MANOVA, factor analysis, multiple discriminant analysis, canonical correlation, etc.
PSYC 7302 -	Equation Modeling	Methods of causal modeling to study causal relations including issues of causality, establishing causality, fundamentals of linear structural equation modeling with latent variables, fitting models.
PSYC 8803 -	Spec Top-Applied Stat	Covers current issues and recent advances in the application of statistical methods to research in psychology. Instructors select the specific focus for a given term.
Management		
MGT 6122 -	Analytical Tools for Mgt	An introductory course dealing with statistical and management science concepts for the fundamental concepts of statistical thinking, involving common statistical and modeling tools for the scientific analysis of data pertaining to different decision situations.
MGT 6600 -	Analytical Tools	Exposes students to the most commonly used statistical and optimization-based analytical tools for decision support. The knowledge of these tools enables the decision maker to make informed decisions based on the data available.
MGT 7102 -	Org Behav Research Meth	This Ph.D. course is an overview and analysis of research methodologies used in conducting scientific research of organizational behavior.
MGT 7354 -	Research Meth-Oper Mgt	This doctoral seminar will discuss papers dealing with research methods in operations management.
Industrial and Systems Engineering		
ISYE 6401 -	Stat Models & Dsgn Expts	Fundamental coverage of topics in multiple regression and factorial experiments.
ISYE 6402 -	Time Series Analysis	Basic forecasting methods, ARIMA models, transfer functions.
ISYE 6404 -	Nonparametric Data Analy	Nonparametric statistics and basic categorical data analysis.
ISYE 6405 -	Statistical Meth-Mfg Dgn	Fractional factorial designs, response surface methods.
ISYE 6411 -	Statistics	Relationships of statistical estimation and linear models with regression, planning and analysis of experiments, and the analysis of correlated data. More mathematical than ISYE 6401.
ISYE 6412 -	Theoretical Statistics	Rigorous introduction to theory of statistical inference. Estimation and testing. Construction and assessment of estimators and tests. Fundamentals of decision theory, minimax, and Bayes Paradigms.
ISYE 6413 -	Dsgn & Analy-Experiments	Analysis of variance, full and fractional factoral designs at two and three levels, orthogonal arrays, response surface methodology, robust parameter design for production/process improvement.
ISYE 6414 -	Regression Analysis	Simple and multiple linear regression, inferences and diagnostics, stepwise regression and model selection, advanced regression methods, basic design and analysis of experiments, factorial analysis.
ISYE 6416 -	Computational Statistics	This class describes the available knowledge regarding statistical computing. Topics include random deviates generation, importance sampling, Monte Carlo Markov chain (MCMC), EM algorithms, bootstrapping, model selection criteria, (e.g. C-p, AIC, etc.) splines, wavelets, and Fourier transform.
ISYE 6420 -	Bayesian Statistics	Rigorous introduction to the theory of Beysian Statistical Inference. Bayesian estimation and testing. Conjugate priors. Noninformative priors. Bayesian computation. Bayesian networks and Bayesian signal processing. Various engineering applications.
ISYE 6644 -	Simulation	Covers modeling of discrete-event dynamic systems and introduces methods for using these models to solve engineering design and analysis problems.
ISYE 6645 -	Monte Carlo Methods	Covers state-of-the-art Monte Carlo simulation techniques. These techniques will be used to model and solve a variety of real-world problems from several diverse areas in science and engineering, including supply chain analysis and design, pattern recognition, VLSI design, network reliability, financial engineering, and molecular biology.
ISYE 6650 -	Probabilistic Models	An introduction to basic stochastic processes such as Poisson and Markov processes and their applications in areas such as inventory, reliability, and queueing.
ISYE 6656 -	Queueing Theory	Processing networks with queuing. Performance analysis using Markov process description of system behavior. Applications and numerical studies in manufacturing, system maintainability, computer systems, telecommunication networks.
ISYE 6661 -	Linear Optimization	Theory, algorithms, and applications of linear programming. Topics include the simplex method and resolution of degeneracy, duality and sensitivity analysis, basis factorization, the dual and revised simplex methods, and geometry of polyhedra. Intended for Ph.D. students.
ISYE 6739 -	Statistical Methods	Overview of basic tools used in statistical analysis and modeling. Credit not allowed to students seeking a degree in ISYE.
SYE 7400 -	Adv Design-Experiments	Random and mixed models, nested and blocked designs. Intended for Ph.D. students and those seeking the M.S. in Statistics.
ISYE 7401 -	Adv Statistical	Modeling Nonlinear models, logistic regression, loglinear models. Intended for Ph.D. students and those seeking the M.S. in Statistics.
ISYE 7405 -	Multivariate Data Analy	Multivariate ANOVA, principal components, factor analysis etc. Intended for Ph.D. students and those seeking the M.S. in Statistics.
ISYE 7406 -	Data Mining&Stat Learn	Topics include neural networks, support vector machines, classification trees, boosting and discriminant analyses. Intended for Ph.D. students and those seeking the M.S. in Statistics.