

STATISTICS (STAT)

STAT 1001 Special Topics (IND 0.0-6.0)

This course is designed to give the department an opportunity to test a new course. Variable title.

STAT 1115 Statistics For The Social Sciences I (LEC 3.0)

A survey course in statistics for the social and behavioral sciences. Main emphasis is on inductive rather than traditional descriptive statistics.

Attention given to the design of experiments, sampling procedures, basic probability distributions, tests of significance, linear regression and correlation, and analysis of variance. Not advised for engineering or science curricula.

STAT 1115 - MOTR MATH 110: Statistical Reasoning

STAT 2001 Special Topics (IND 0.0 and LAB 0.0 and LEC 0.0)

This course is designed to give the department an opportunity to test a new course. Variable title.

STAT 3111 Statistical Tools For Decision Making (LAB 1.0 and LEC 2.0)

An introduction to statistical techniques commonly used in management decision making. Topics include statistical inference of population parameters, linear regression, basics of experimental design and analysis, analysis of categorical data, and the use of statistical software. Credit will be given for only one of Stat 3111, 3113, 3115 or 3117. Prerequisite: Math 1208 or 1212 or 1214 with a grade of "C" or better.

STAT 3113 Applied Engineering Statistics (LEC 3.0)

An introduction to applied statistical methods in engineering dealing with basic probability, estimation, tests of hypotheses, regression, design of experiments and control charts. Statistical computer packages will be used in connection with some of the material studies. Credit will be given for only one of Stat 3111, 3113, 3115 or 3117. Prerequisite: Math 1215 or 1221 with a grade of "C" or better.

STAT 3115 Engineering Statistics (LEC 3.0)

An introduction to statistical methods in engineering and the physical sciences dealing with basic probability, distribution theory, confidence intervals, significance tests, and sampling. Credit will be given for only one of Stat 3111, 3113, 3115 or 3117. Prerequisite: Math 1215 or 1221 with a grade of "C" or better.

STAT 3117 Introduction To Probability And Statistics (LEC 3.0)

Introduction to probability, distribution theory, statistical inference, with applications to physical and engineering sciences. Probability, probability and joint distributions, functions of random variables, system reliability, point and interval estimation, testing hypotheses, regression analysis. Credit will be given for only one of Stat 3111, 3113, 3115, or 3117. Prerequisite: Math 2222 with a grade of "C" or better.

STAT 3425 Introduction to Biostatistics (LAB 1.0 and LEC 3.0)

Introduction to common biostatistical methods for designing research studies, collecting and analyzing data, with application to problems originating from the biological, environmental, and health sciences.

Topics include randomization, means comparisons, ANOVA, regression, and analysis of count data. Prerequisites: A grade of "C" or better in Math 1120, Math 1140, Math 1208, Math 1212, or Math 1214.

STAT 4000 Special Problems (IND 0.0-6.0)

Problems or readings on specific subjects or projects in the department. Consent of instructor required.

STAT 4001 Special Topics (LAB 1.0 and LEC 3.0)

This course is designed to give the department an opportunity to test a new course. Variable title.

STAT 4099 Undergraduate Research (IND 0.0-6.0)

This course is designed for the undergraduate student who wishes to engage in research. It is not to be used for graduate credit nor for more than six credit hours of undergraduate credit. The subject and credit are to be arranged with the instructor. Prerequisite: Consent of instructor.

STAT 4210 Introduction to Statistical Data Science (LEC 3.0)

A course introducing students to key data science methodologies and inferential thinking. A set of tools for modeling and understanding complex datasets will be developed. Methods such as regression, cross-validation, classification, tree-based methods, support vector machines, and unsupervised learning will be covered. Prerequisites: Stat 3113 or Stat 3115 or Stat 3117; Math 2222 or Math 3108; Comp Sci 1500 or Comp Sci 1570.

STAT 5000 Special Problems (IND 0.0-6.0)

Problems or readings on specific subjects or projects in the department. Consent of instructor required.

STAT 5001 Special Topics (IND 0.0 and LEC 0.0)

This course is designed to give the department an opportunity to test a new course. Variable title.

STAT 5099 Graduate Research (IND 0.0-6.0)

Investigation of an advanced nature leading to the preparation of a MS thesis or dissertation.

STAT 5260 Statistical Data Analysis Using SAS (LAB 1.0 and LEC 2.0)

This course will introduce the student to selected data analytic tools implemented in the Statistical Analysis System (SAS) and appropriate and effective use of these tools. Focus would be on both the use of SAS data analytic tools and the theoretical and methodological rationale that form the basis of such analyses. Prerequisite: One of Stat 3113 or 3115 or 3117 or 5643; and one of Stat 5346 or 5353 or 6841 or 6343 or 6344 or 6545.

STAT 5290 Computational Bayesian Methods using Python (LEC 3.0)

An introduction to Bayesian data analytic tools implemented in the Python programming language and their appropriate and effective use. The focus of the course is on the computational strategies and algorithms for Bayesian models and a discussion of theoretical underpinnings of the methods implemented. Prerequisites: One of Stat 3113 or Stat 3115 or Stat 3117 or Stat 5643; and one of Stat 5346 or Stat 5353 or Stat 6841 or Stat 6343 or Stat 6344 or Stat 6545.

STAT 5346 Regression Analysis (LEC 3.0)

Simple linear regression, multiple regression, regression diagnostics, multicollinearity, measures of influence and leverage, model selection techniques, polynomial models, regression with autocorrelated errors, introduction to non-linear regression. Prerequisites: Math 2222 and one of Stat 3111, 3113, 3115, 3117, or 5643. (Co-listed with Comp Sci 5204).

STAT 5353 Statistical Data Analysis (LEC 3.0)

Introduction to methods for analyzing statistical data from experiments and Introduction to methods for analyzing statistical data from experiments and surveys. Analysis of variance, correlation, introduction to regression techniques, contingency tables, non-parametric techniques and introduction to modern statistical software. Prerequisites: Math 2222 and one of Stat 1115, 3113, 3115 and 3117.

STAT 5643 Probability And Statistics (LEC 3.0)

Introduction to the theory of probability and its applications, sample spaces, random variables, binomial, Poisson, normal distributions, derived distributions, and moment generating functions. Prerequisite: Math 2222.

STAT 5644 Mathematical Statistics (LEC 3.0)

A continuation of Stat 5643 with introduction to the theories of point estimation, hypothesis testing, and interval estimation. Includes sufficiency, completeness, likelihood and how they apply to the exponential family. Prerequisite: Stat 5643.

STAT 5755 Statistical Models in Actuarial Science (LEC 3.0)

This course covers the statistical foundation of actuarial models and their applications. Topics include survival and severity models, Kaplan-Meier and Nelson-Aalen estimators, aggregate and credibility models for insurance losses, discrete time Markov chains, ruin theory, and simulation. Prerequisite: Stat 5643 and either Stat 5644 or a 3000-level Stat course. (Co-listed with Econ 4350).

STAT 5756 Statistical Models for Life Contingencies (LEC 3.0)

The basic statistical theory of actuarial models for life uncertainties such as time of death. Multiple life and multiple decrement models, statistical models for life and contingent insurance; last survivor, disability, withdrawal, retirement and reserving models for life insurance. Prerequisite: Stat 5643.

STAT 5814 Applied Time Series Analysis (LEC 3.0)

Introduction to time series modeling of empirical data observed over time. Topics include stationary processes, autocovariance functions, moving average, autoregressive, ARIMA, and GARCH models, spectral analysis, confidence intervals, forecasting, and forecast error. Prerequisites: One of Stat 3113, 3115, 3117, 5643 and one of Math 3103, 3108, or 5108.

STAT 5904 Science Education and Quantitative Literacy for Middle School Teachers (LEC 3.0)

An integrated science-mathematics course for middle school teachers. Course covers selected science/mathematics topics/skills specified in Missouri standards for grades 5-7. Inquiry based methods of teaching these topics in an integrated manner will be emphasized. Prerequisite: Current enrollment in a Teacher Education Program or a full or part-time teacher in a K-12 school. (Co-listed with Physics 4625).

STAT 5905 Making Sense Of Data For Elementary School Teachers (LEC 3.0)

An activity based course that is intended to provide elementary school teachers with the skills necessary to implement the Probability & Statistics strand of the American Statistical Association of the National Council of Teachers of Mathematics (NCTM) joint. Prerequisite: Graduate Standing.

STAT 6000 Special Problems (IND 0.0-6.0)

Problems or readings on specific subjects in the department. Consent of instructor required.

STAT 6001 Special Topics (LEC 0.0-6.0)

This course is designed to give the department an opportunity to test a new course. Variable title.

STAT 6040 Oral Examination (IND 0.0)

After completion of all other program requirements, oral examinations for on-campus M.S./Ph.D. students may be processed during intersession. Off-campus M.S. students must be enrolled in oral examination and must have paid an oral examination fee at the time of the defense/comprehensive examination (oral/ written). All other students must enroll for credit commensurate with uses made of facilities and/or faculties. In no case shall this be for less than three (3) semester hours for resident students.

STAT 6050 Continuous Registration (LEC 1.0)

Doctoral candidates who have completed all requirements for the degree except the dissertation and are away from the campus must continue to enroll for at least one hour of credit each registration period until the degree is completed. Failure to do so may invalidate the candidacy. Billing will be automatic as will registration upon payment.

STAT 6099 Research (IND 0.0-15)

Investigations of an advanced nature leading to the preparation of a thesis or dissertation. Consent of instructor required.

STAT 6239 Clustering Algorithms (LEC 3.0)

An introduction to cluster analysis and clustering algorithms rooted in computational intelligence, computer science and statistics. Clustering in sequential data, massive data and high dimensional data. Students will be evaluated by individual or group research projects and research presentations. Prerequisite: At least one graduate course in statistics, data mining, algorithms, computational intelligence, or neural networks, consistent with student's degree program. (Co-listed with Comp Eng 6330, Elec Eng 6830, Sys Eng 6214 and Comp Sci 6405).

STAT 6342 Categorical Data Analysis (LEC 3.0)

A graduate-level introduction to statistical methods for analyzing categorical data. The topics include: contingency tables, generalized linear models including logistic regression models, log-linear models, ordinal and nominal regression models, Poisson regression, etc. The course will involve practical applications of the ideas and their implementations. Prerequisites: Stat 5644 and one of Stat 5346, Stat 5353, Stat 6344, or Stat 6553.

STAT 6343 Nonparametric Statistical Methods (LEC 3.0)

A course covering distribution free statistical methods. Topics include: order statistics, tests of hypotheses for one-sample and two-sample problems, analyses of variance, goodness-of-fit tests, runs test, independence and regression problems, point and interval estimation, ARE. Prerequisite: Stat 5644.

STAT 6344 Design And Analysis Of Experiments (LEC 3.0)

Experimental designs and their statistical analysis. Includes completely randomized designs, complete and incomplete blocking designs, factorial and fractional factorial experiments, multiple comparisons, response surface analysis. Prerequisites: One of Stat 5353, Eng Mgt 5715 and one of Stat 3111, 3113, 3115, 3117, 5643; or Stat 5643 and one of Stat 3111, 3113, 3115, 3117.

STAT 6545 Multivariate Statistical Methods (LEC 3.0)

Analysis of data consisting of simultaneous measurements on many variables. Multivariate normal distribution, multivariate analysis of variance, canonical correlation, principal components, classification and clustering techniques. Prerequisites: Stat 5644 and Math 3108.

STAT 6553 Linear Statistical Models I (LEC 3.0)

Includes a development of the theory of the distribution of quadratic forms, and the estimation of parameters and testing hypotheses in linear statistical models. Prerequisites: Math 3108 and Stat 5643 and either Stat 5353 or 5644.

STAT 6554 Linear Statistical Models II (LEC 3.0)

Includes the theory of polynomial models, regression models, experimental design models, incomplete block models, nonlinear models, with emphasis on optimum properties of point and interval estimation and the power of tests. Prerequisite: Stat 6553.

STAT 6657 Advanced Mathematical Statistics I (LEC 3.0)

The theory of estimation and hypothesis testing. Completeness and sufficiency. Maximum likelihood, minimax, Bayesian and invariant procedures for testing. Sequential decision rules. Emphasis on estimation. Prerequisites: Stat 5644 and Math 5215.

STAT 6658 Advanced Mathematical Statistics II (LEC 3.0)

A continuation of Stat 6657 with the emphasis on hypothesis testing. Prerequisite: Stat 6657.

STAT 6814 Statistical Time Series Analysis (LEC 3.0)

A formal introduction to the fundamentals of statistical modeling and analysis of discrete time series. Topics include autoregressive and moving average processes, ARMA models, second order stationarity, vector processes, autocorrelation function, Fourier representation, estimation and prediction of time series. Prerequisites: Stat 5643 and Math 3103 or 3108.

STAT 6841 Stochastic Processes (LEC 3.0)

Development and application of Poisson and nonhomogeneous Poisson processes; renewal processes; Markov chains and processes including birth and death processes; and normal processes, including Brownian motion. Prerequisites: A grade of "C" or better in Math 2222, Math 3304, and Stat 5643.

STAT 6846 Advanced Probability Theory (LEC 3.0)

Probability spaces, random variables, distribution functions, expectations, independence, convergence theorems, characteristic functions, moment generating functions, and central limit theorem. Prerequisites: Stat 5644 and Math 5215.
