STATISTICS (STAT)

STAT 2601   Introductory Statistics   3 s.h.
Designed for students from different disciplines who desire an introduction to statistical reasoning. Topics include collecting and summarizing data, concepts of randomness and sampling, statistical inference and reasoning, correlation and regression. Credit will not be given for both STAT 2601 and STAT 2625.
Prereq.: "C" or better in MATH 1552 or Level 35 or higher on YSU Mathematics Placement Test.
Gen Ed: Mathematics.

STAT 2625   Statistical Literacy and Critical Reasoning   4 s.h.
An introduction to statistics and its applications. Topics include descriptive statistics, experimental design, probability sampling distribution, statistical inference, correlation and regression. Emphasis on applications, critical reasoning, and data analysis using statistical software. Credit will not be given for both STAT 2601 and STAT 2625.
Prereq.: At least Mathematics Placement Level 15.
Gen Ed: Mathematics.

STAT 2625C   Statistical Literacy and Critical Reasoning with Co-Requisite Support   6 s.h.
An introduction to statistics and its applications. Topics include descriptive statistics, experimental design, probability, sampling distribution, statistical inference, correlation and regression. Emphases are on applications, critical reasoning, and data analysis using statistical software. Includes co-requisite support for basic algebra skills required to be successful in the course.
Gen Ed: Mathematics.

STAT 3717   Statistical Methods   4 s.h.
Probability and statistics designed for students majoring in the natural sciences. Topics include descriptive statistics, probability, estimation, testing hypotheses, analysis of variance, regression and nonparametric statistics. Use of personal computers with computer software will be required. Credit will not be given for both STAT 3717 and STAT 3743.
Prereq.: "C" or better in one of MATH 1552, MATH 1570, MATH 1571, MATH 1571H, MATH 1581H, MATH 1585H or equivalent.

STAT 3717H   Honors Statistical Methods   4 s.h.
Probability and statistics designed for students majoring in the natural sciences. Topics include descriptive statistics, probability, estimation, testing hypotheses, analysis of variance, regression and nonparametric statistics. Use of personal computers with computer software will be required. Credit will not be given for both STAT 3717 and STAT 3743.
Prereq.: "C" or better in one of MATH 1552, MATH 1570, MATH 1571, MATH 1571H, MATH 1581H, MATH 1585H or equivalent.

STAT 3743   Probability and Statistics   4 s.h.
A calculus-based probability and statistics course. Topics include descriptive statistics, probability models and related concepts and applications, statistical estimation, and hypothesis testing. Credit will not be given for both STAT 3717 and STAT 3743.
Prereq.: "C" or better in MATH 1572, MATH 1572H, MATH 1581, MATH 1581H or MATH 1585H.

STAT 3743H   Honors Probability and Statistics   4 s.h.
A calculus-based probability and statistics course. Topics include descriptive statistics, probability models and related concepts and applications, statistical estimation, and hypothesis testing. Credit will not be given for both STAT 3717 and STAT 3743/H.
Prereq.: "C" or better in MATH 1572, MATH 1572H, or MATH 1585H.

STAT 4817   Applied Statistics   3 s.h.
Application of regression, survey sampling, analysis of variance, design and analysis of experiments, and related topics.
Prereq.: STAT 3717 or STAT 3743 or equivalent.

STAT 4843   Theory of Probability   3 s.h.
The mathematical foundation of probability theory including the study of discrete and continuous distributions. Other topics selected from limit theorems, generating functions, stochastic processes, and applications.
Prereq.: STAT 3743 and one of MATH 2673 or MATH 2686H or consent of department chairperson.

STAT 4844   Theory of Statistics   3 s.h.
The mathematical theory of statistical inferences including likelihood principle, sufficient statistics, theory of statistical estimation, hypothesis testing and related topics.
Prereq.: STAT 4843.

STAT 4848   Applied Regression Time Series   3 s.h.
Statistical methods for regression and time series analysis. Topics include applied linear regression with model fitting and diagnostics, data analysis, and forecasting with time series models.
Prereq.: STAT 3717 or STAT 3743.

STAT 4849   Design of Experiments   3 s.h.
The objective of this course is to learn how to plan, design and conduct experiments efficiently, and apply statistical techniques on resulting data to obtain conclusions. Topics include introduction of experiments, complete randomized designs, blocking designs, factorial designs, nested designs, and random effects models.
Prereq.: STAT 4817 or STAT 6940 or equivalent.

STAT 4896   Statistical Project   2 s.h.
Individualized study of a topic in statistics culminating in a written report and an oral presentation. May be repeated once.
Prereq.: STAT 4817 and permission of chairperson.
Gen Ed: Capstone.

STAT 5802   Theory of Interest   3 s.h.
Mathematical theory and techniques in analysis of interest. Topics include measurement of interest, force of interest, annuities, amortization, pricing of investment products, and applications to actuarial sciences.
Prereq.: MATH 1572 and any 3700 level MATH, STAT, ECON, or FIN course.

STAT 5811   SAS Programming for Data Analytics   3 s.h.
An introduction to SAS programming for data analytics. Topics include using SAS for data processing, manipulation, visualization, reporting and statistical analysis. The objective is for students to develop statistical computing skills for problem solving and decision making. Also listed as ECON 5861.
Prereq.: STAT 3717 or STAT 3743 or STAT 2601 or ECON 3790 or equivalent.

STAT 5814   Statistical Data Mining   3 s.h.
A systematic introduction to data mining with emphasis on various data mining problems and their solutions. Topics include data mining processes and issues, exploratory data analysis, supervised and unsupervised learning, classification, and prediction methods.
Prereq.: STAT 3717 or STAT 3743, or consent of department chairperson.

STAT 5819   Bayesian Statistics   3 s.h.
An introduction to the Bayesian approach to statistical inference for data analysis in a variety of applications. Data analysis using statistical software will be emphasized. Topics include: comparison of Bayesian and frequentist methods, Bayesian model specification, prior specification, basics of decision theory, Markov chain Monte Carlo, Bayes factor, empirical Bayes, Bayesian linear regression and generalized linear models, hierarchical models.
Prereq.: STAT 3717 or STAT 3743 or STAT 4817 or STAT 6940 or equivalent.

STAT 5840   Statistical Computing   3 s.h.
Computational methods used in statistics. Topics include generation and testing of random numbers, computer intensive methods, and simulation studies.
Prereq.: STAT 3717 or STAT 3743.

STAT 5846   Categorical Data Analysis   3 s.h.
Discrete distributions, contingency table analysis, odds ratios, relative risk, logistic regression, hierarchical models.
Prereq.: STAT 3743 or equivalent.

STAT 5849   Multivariate Statistical Analysis   3 s.h.
The statistical analysis of multivariate observations. Topics include multivariate probability distribution theory, regression, analysis of variance, and techniques in data analysis.
Prereq.: MATH 3720 and STAT 3743 or equivalent.

STAT 5857   Statistical Consulting   3 s.h.
The objective of this course is to cultivate the skills necessary to competently engage in statistical consulting. Topics include problem solving, study design, power and sample size, data management, selection and application of statistical methods, ethical practice, and effective visual and literal communication of results.
Prereq.: STAT 4817 or equivalent.

STAT 5895   Special Topics in Statistics   2-3 s.h.
The study of a standard statistical topic in depth or the development of a special area of statistics. May be repeated twice.
Prereq.: STAT 3717 or STAT 3743.

STAT 6904   Long-Term Actuarial Mathematics 1   3 s.h.
An introduction to long-term actuarial mathematics through an analysis of survival models and their applications as well as the determination and interpretation of probabilities and statistics related to the present value random variable.
Prereq.: STAT 4843, STAT 6943, or consent of the instructor.

STAT 6905   Long-Term Actuarial Mathematics 2   3 s.h.
A continuation of the study of long-term actuarial mathematics through the application of premium-calculation methodologies and reserving.
Prereq.: STAT 6904.

STAT 6910   Short-Term Actuarial Mathematics 1   3 s.h.
An introduction to the development of loss and severity models used in actuarial science and the statistical methods used to estimate the parameters of such models.
Prereq.: STAT 4844, STAT 6944 or equivalent.

STAT 6911   Short-Term Actuarial Mathematics 2   3 s.h.
A continuation of parametric statistical methods used in short-term actuarial mathematics through an introduction to credibility theory and ratemaking and reserving in casualty insurance.
Prereq.: STAT 6910.

STAT 6912   Advanced SAS Programming for Data Analytics   3 s.h.
This course is designed to provide students with training in advanced SAS programming for data analytics. Main topics include SQL, Macro language, selected SAS statistical analysis procedures, and working with large data sets. Also listed as ECON 6992.
Prereq.: STAT 5811 or ECON 5861.

STAT 6940   Advanced Data Analysis   3 s.h.
An overview of techniques in data analysis. Includes a strong emphasis on visual interpretation of data. Topics include one or more samples, proportions, odds, regression, and multiple comparisons.
Prereq.: STAT 3743 or permission of graduate coordinator.

STAT 6943   Mathematical Statistics 1   3 s.h.
Random variables, their distributions and densities. Families and exponential families of distribution. Independence, joint distributions, conditional probability and expectation. Convergence and limit theorems. Credit will not be given for both STAT 4843 and STAT 6943.
Prereq.: MATH 3751 or MATH 5851 or permission of graduate coordinator.

STAT 6944   Mathematical Statistics 2   3 s.h.
A study of theories and properties of statistical hypothesis testing and estimation, including maximum likelihood method, likelihood ratio tests, sufficiency, and related topics. Credit will not be given for both STAT 4844 and STAT 6944.
Prereq.: STAT 4843 or STAT 6943 or permission of graduate coordinator.

STAT 6948   Linear Models   3 s.h.
A study of linear statistical models of the relationship between analysis of variance and regression and the assumptions underlying the analysis of variance.
Prereq.: STAT 4817 or STAT 6940.

STAT 6949   Design and Analysis of Experiments   3 s.h.
Fundamental principles of design and analysis of experiments. Topics include blocking; multifactor testing; multiple comparisons; repeated measures; crossing and nesting designs.
Prereq.: STAT 4817 or STAT 6940.