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 1581, 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 1581, 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, MATH 1581, MATH 1581H 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 Mathematical Interest Theory 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.: C or better in one of MATH 1552, MATH 1570, MATH 1571, MATH 1571H, h.

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 Actuarial Mathematics 1 3 s.h.
This course introduces students to the basics of insurance, ratemaking and reserving for short-term coverage as well as an introduction to actuarial modeling in short-term settings.
Prereq.: STAT 4843, STAT 6943, or consent of the instructor.

STAT 6905 Actuarial Mathematics 2 3 s.h.
This course introduces students to the basics of contingent payment models.
Prereq.: STAT 4843, STAT 6943, or consent of the instructor.

STAT 6910 Advanced Short-Term Actuarial Mathematics 3 s.h.
This course covers more advanced topics in short-term actuarial mathematics, including severity distributions, coverage modifications, Bayesian credibility, and calculation of premiums and reserves.
Prereq.: STAT 6904 or equivalent.

STAT 6911 Advanced Long-Term Actuarial Mathematics 3 s.h.
This course covers more advanced topics in long-term actuarial mathematics, including multiple state mortality and joint life mortality models, premium and policy valuation for long-term coverages, profit analysis, and pension plans and retirement benefits.
Prereq.: STAT 6905 or equivalent.

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.