Course Master Catalog

STAT

STAT1031

Introduction to Statistics

A one-semester comprehensive introduction to statistics suitable for students in biology, nursing, allied health, and applied science. Discussion of data, frequency distributions, graphical and numerical summaries, design of statistical studies, and probability as a basis for statistical inference and prediction. The concepts and practice of statistical inference including confidence intervals, one and two sample t-tests, chi-square tests, regression and analysis of variance, with attention to selecting the procedure(s) appropriate for the question and data structure, and interpreting and using the result.Pre-requisite: At least 420 on the MPT strongly recommended. Credit Level:U Credit Hrs:3 BoK:QR. Baccalaureate Competency: Critical Thinking, Social Responsibility.

STAT1034

Elementary Statistics I

An introduction to statistics for students without a calculus background. The course covers data analysis (numerical summaries and graphics for describing and displaying the distributions of numerical and categorical data), the basic principles of data collection from samples and experiments, elementary probability, the application of the normal distribution to the study of random samples, statistical estimation (construction and interpretation of one sample confidence intervals), and an introduction to hypothesis testing (the structure of one sample hypothesis tests and the logic of using them to make decisions).Pre-requisite: At least 420 on the MPT strongly recommended. Credit Level:U Credit Hrs:3 BoK:QR. Baccalaureate Competency: Critical Thinking, Social Responsibility.

STAT1035

Elementary Statistics II

An introduction to inferential statistics for students without a calculus background. The course covers one and two-sample hypothesis tests for means and proportions, chi-squared tests, linear regression, analysis of variance, and non-parametric tests based on ranks, with attention to selecting the procedure(s) appropriate for the question and data structure, and interpreting the results. Prerequisite: Elementary Statistics I Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking, Social Responsibility.

STAT2037

Probability and Statistics I

An introduction to probability and statistics for students with a calculus background. The course covers sample spaces and probability laws; discrete and continuous random variables with special emphasis on the binomial, Poisson, hypergeometric, normal and gamma distributions; joint distributions; sampling distributions; one and two-sample parameter estimation problems; and one and two-sample tests of hypotheses. This course provides a foundation for the further study of statistics. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. BoK:QR. Baccalaureate Competency: Critical Thinking, Social Responsibility.

STAT3038

Probability and Statistics II

A second course in probability and statistics for students with a calculus background. This course covers chi-square tests used in goodness-of-fit problems as well as contingency tables, model building, simple and multiple linear regression, analysis of variance, experimental design, reliability, and quality control. The SAS software package may be used. This course provides a foundation for the further study of statistics. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. TouchPoint:MidCollegiate Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

STAT4021

Special Topics in Statistics

This occasionally offered course will allow the student to be exposed to topics in the study of statistics that are not offered as part of our regular sequence of statistics courses. It will allow students to gain appreciation for the breadth of fields that are part of modern statistical science. Credit Level:U Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Knowledge Integration, Social Responsibility.

STAT6021

Mathematical Statistics I

The purpose of these courses is to understand the theory of statistical inference using techniques, definitions, and concepts that are statistical and that are natural extensions and consequences of the statistical concepts. Specific topics include in Probability and Distributions, Multivariate Distributions, Some Special Statistical Distributions, Unbiasedness, Consistency, and Limiting Distributions and Central Limit Theorem. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration.

STAT6022

Mathematical Statistics II

The purpose of these courses is to understand the theory of statistical inference using techniques, definitions, and concepts that are statistical and that are natural extensions and consequences of the statistical concepts. Specific topics include in Basics of statistical Inferences including point and interval estimation, Method of Moments and Maximum Likelihood estimation, Hypothesis testing, Sufficiency, Exponential family, Rao-Blackwell Theorem and Rao-Cramer Lower Bounds, Likelihood Ratio Tests, Neymann-Pearson Lemma and its applications. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

STAT6031

Applied Statistics I

The purpose of these courses is to understand statistical inference and data analysis in simple linear regression model and multiple linear regression models including model selections. Specific topics include: correlation coefficient, statistical inference of parameters, checking model assumptions, variable selection, transformations of variables and diagnostics. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

STAT6032

Applied Statistics II

The course covers the theory and application of analysis of variance with one-, two-, and higher-way layouts, random effects and mixed models. Mathematical and interpretational aspects of the models will be covered along with statistical estimation, confidence intervals and multiple hypothesis testing. SAS statistical software will be used.Specific topics include: ANOVA for some standard experimental designs. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

STAT6041

Time Series

This course will cover the basics of time series analysis, including autocorrelation, moving averages, autoregressive models, seasonality, forecasting, spectral analysis, Box Jenkins ARIMA models, and transfer function models and multivariate ARIMA models. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

STAT6042

Survival Analysis and Logistic Regression

This course will begin with a detailed description of maximum likelihood. It will then discuss generalized linear models, including logistic and Poisson regression. Finally various topics in survival analysis will be covered: namely Kaplan-Meier curves and log-rank statistics, Weibull regression, and Cox proportional hazard regression. Examples from medicine and engineering will be given. SAS and S-plus statistical software will be used. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

STAT6043

Applied Bayesian Analysis

Foundation of Bayesian Statistics, basic theory and several applications including Monte Carlo and Markov Chain Monte Carlo Methods for computing Bayesian inference will be covered. Specific topics include: Foundation of Bayesian Approach, Prior and Posterior distributions; Choice of Priors: subjective and non-subjective or default approaches; Inference using posterior distribution for standard models; and Hierarchical models, and their applications. WinBUGS will be introduced. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

STAT6044

Nonparametric Statistics

Rank-based statistical inference will be covered. Topics include, but are not limited to, the one- and two-sample location problems including the Wilcoxon signed-rank and rank-sum test, Spearman correlation coefficient, one- and two-way Analysis-of-Variance tests, and Kolmogorov-Smirnov test for testing different distributions. In addition, the multiple comparisons issue will be discussed, specifically by comparing several treatments with and without a control treatment. Null distributions of test statistics will be discussed in the small sample and asymptotic cases, with and without ties. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration, Social Responsibility.

STAT6045

Statistical Computing with SAS and S-plus

This course will cover the basics of using the SAS and S-plus statistical software. Topics covered include: importing external files, subsetting and merging data files, performing statistical procedures, graphics, matrix calculations, and macros and functions. Credit Level:U,G Credit Hrs:3 Pre-req: See your college advisor for details. Baccalaureate Competency: Critical Thinking, Effective Communication, Information Literacy, Knowledge Integration.