

# Statistics (STAT)

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## Courses

### STAT A200 Elementary Statistics 3 Credits

Introduction to concepts and applications of elementary statistical methods. Topics include sampling, data analysis, descriptive statistics, elementary probability, probability and sampling distributions, confidence intervals, hypothesis testing, correlation, and simple linear regression.

**Special Note:** A student may apply no more than 3 credits from STAT A200 or ECON A227 toward the graduation requirements for a baccalaureate degree.

**Prerequisites:** MATH A104 with a minimum grade of C or MATH A105 with a minimum grade of C or ALEKS Overall Test 1 with a score of 055 or ALEKS Overall Test 2 with a score of 055 or ALEKS Overall Test 3 with a score of 055 or ALEKS Overall Test 4 with a score of 055 or ALEKS Overall Test 5 with a score of 055.

**Attributes:** UAA Quantitative Skills GER.

### STAT A253 Applied Statistics for the Sciences 4 Credits

Intensive survey course with applications for the sciences. Topics include descriptive statistics, probability, random variables, binomial, Poisson and normal distributions, estimation and hypothesis testing of common parameters, analysis of variance for single factor and two factors, correlation, and simple linear regression. A major statistical software package will be utilized.

**Registration Restrictions:** If prerequisite is not satisfied, an approved UAA placement test is required.

**Prerequisites:** MATH A121 with a minimum grade of C or MATH A151 with a minimum grade of C or MATH A155 with a minimum grade of C or ALEKS Overall Test 1 with a score of 065 or ALEKS Overall Test 2 with a score of 065 or ALEKS Overall Test 3 with a score of 065 or ALEKS Overall Test 4 with a score of 065 or ALEKS Overall Test 5 with a score of 065.

**Attributes:** UAA Quantitative Skills GER.

### STAT A307 Probability and Statistics 4 Credits

A calculus-based introduction to probability and statistics with emphasis on scientific applications. Topics include probability, probability distributions for discrete and continuous random variables, joint distributions, mathematical expectation, moment generators, functions of random variables, estimation, and the study of power and significance of hypothesis tests.

**Prerequisites:** MATH A221 with a minimum grade of C or MATH A252 with a minimum grade of C.

### STAT A308 Intermediate Statistics for the Sciences 3 Credits

Establishes familiarity with statistical tools used to analyze data in a variety of disciplines, and provides experience reading and understanding studies based on data analysis. Topics include experimental design, selecting and assessing a model, multiple regression, multifactor analysis of variance, and categorical data analysis. These topics are explored using a major statistical software.

**Registration Restrictions:** Junior or senior standing and completion of Tier 1 GER courses

**Prerequisites:** STAT A200 with a minimum grade of C or STAT A253 with a minimum grade of C or STAT A307 with a minimum grade of C.

**Attributes:** UAA Integrative Capstone GER.

### STAT A402 Scientific Sampling 3 Credits

Sampling methods including simple random, stratified, systematic and cluster sampling. Special emphasis on estimation procedures including ratio and regression methods, and topics selected from allocations, direct sampling, inverse sampling, randomized response sampling, computer simulation of random variates, bootstrap, jackknife, and cross-validation.

**Special Note:** Not available for credit to students who have completed STAT A602.

**Registration Restrictions:** Instructor approval

**May Be Stacked With:** STAT A602

**Prerequisites:** STAT A200 with a minimum grade of C or STAT A253 with a minimum grade of C or STAT A307 with a minimum grade of C or STAT A308 with a minimum grade of C.

### STAT A403 Regression Analysis 3 Credits

Simple and multiple regression, statistical inferences in regression, matrix formulation of regression, polynomial regression, ridge regression, nonlinear regression and normal correlation models. A major statistical package is used as a tool to aid calculations required for many of the techniques.

**Special Note:** Not available for credit to students who have completed STAT A603.

**Registration Restrictions:** Instructor approval

**May Be Stacked With:** STAT A603

**Prerequisites:** STAT A308 with a minimum grade of C.

### STAT A404 Analysis of Variance 3 Credits

Single-factor models, factor effects, nonparametric tests, two-factor models, random and mixed effects models, multifactor studies, analysis of covariance and selected experimental designs. A major statistical package is used as a tool to aid calculations required for many of the techniques.

**Special Note:** Not available for credit to students who have completed STAT A604.

**Registration Restrictions:** Instructor approval

**May Be Stacked With:** STAT A604

**Prerequisites:** STAT A308 with a minimum grade of C.

**STAT A407 Time Series Analysis 3 Credits**

Decomposition of time series, seasonal adjustment methods and index numbers. Forecasting models, including causal models, trend models and smoothing models. Autoregressive (AR) forecasting models, moving average (MA) forecasting models and integrated (ARIMA) forecasting models. A major statistical package is used as a tool to aid calculations required for many of the techniques.

**Special Note:** Not available for credit to students who have completed STAT A607.

**Registration Restrictions:** Instructor approval

**May Be Stacked With:** STAT A607

**Prerequisites:** STAT A307 with a minimum grade of C or STAT A308 with a minimum grade of C.

**STAT A408 Multivariate Statistics 3 Credits**

Multivariate statistical methods including exploratory data analysis, geometrical interpretation of multivariate data, multivariate tests of hypotheses, multivariate analysis of variance, multivariate multiple regression, principal components, factor analysis, discriminant analysis, cluster analysis and multidimensional scaling.

**Special Note:** Not available for credit to students who have completed STAT A608.

**Registration Restrictions:** Instructor approval

**May Be Stacked With:** STAT A608

**Prerequisites:** STAT A308 with a minimum grade of C.

**STAT A410 Statistical Methods 3 Credits**

Parametric and nonparametric statistical methods. Topics will include, but not be restricted to, contingency table analysis, goodness-of-fit tests, simple linear and multiple regression, curvilinear regression, logistic regression, design and analysis of single and multifactor experiments, and introduction to multivariate statistics.

**Special Note:** Not available for credit to students who have completed STAT A610.

**Registration Restrictions:** Instructor approval

**May Be Stacked With:** STAT A610

**Prerequisites:** STAT A253 with a minimum grade of C or STAT A308 with a minimum grade of C.

**STAT A602 Advanced Scientific Sampling 3 Credits**

Sampling methods including simple random, stratified, systematic and cluster sampling. Special emphasis on estimation procedures including ratio and regression methods and topics selected from: allocations, direct sampling, inverse sampling, randomized response sampling, Monte Carlo simulated variates, bootstrap, jackknife and cross validation.

**Special Note:** Not available for credit to students who have completed STAT A402. Students will be required to design a research project, analyze its data and write a professional-quality term paper.

**Registration Restrictions:** Graduate standing or instructor approval

**May Be Stacked With:** STAT A402

**STAT A603 Advanced Regression Analysis 3 Credits**

Simple and multiple regression, statistical inferences in regression, matrix formulation of regression, polynomial regression, ridge regression, nonlinear regression and normal correlation models. A major statistical package is used as a tool to aid calculations required for the many techniques.

**Special Note:** Not available for credit to students who have completed STAT A403. Students will be required to design a research project, analyze its data and write a professional-quality term paper.

**Registration Restrictions:** Graduate standing or instructor approval

**May Be Stacked With:** STAT A403

**STAT A604 Advanced Analysis of Variance 3 Credits**

Single-factor models, factor effects, nonparametric tests, two-factor models, random and mixed effects models, multifactor studies, analysis of covariance, and selected experimental designs. A major statistical package is used as a tool to aid calculations required for many of the techniques.

**Special Note:** Not available for credit to students who have completed STAT A404. Students will be required to design a research project, analyze its data and write a professional-quality term paper.

**Registration Restrictions:** Graduate standing or instructor approval

**May Be Stacked With:** STAT A404

**STAT A607 Advanced Time Series Analysis 3 Credits**

Decomposition of time series, seasonal adjustment methods and index numbers. Forecasting models including causal models, trend models and smoothing models. Autoregressive (AR) forecasting models, moving average (MA) forecasting models and integrated (ARIMA) forecasting models. A major statistical package is used as a tool to aid calculations required for many of the techniques.

**Special Note:** Not available for credit to students who have completed STAT A407. Students will be required to design a research project, analyze its data and write a professional-quality term paper.

**Registration Restrictions:** Graduate standing or instructor approval

**May Be Stacked With:** STAT A407

**STAT A608 Advanced Multivariate Statistics 3 Credits**

Multivariate statistical methods including exploratory data analysis, geometrical interpretation of multivariate data, multivariate tests of hypotheses, multivariate analysis of variance, multivariate multiple regression, principal components, factor analysis, discriminant analysis, cluster analysis and multidimensional scaling.

**Special Note:** Not available for credit to students who have completed STAT A408. Students will be required to design a research project, analyze its data and write a professional-quality term paper.

**Registration Restrictions:** Graduate standing or instructor approval

**May Be Stacked With:** STAT A408

**STAT A610** Advanced Statistical Methods **3 Credits**

Parametric and nonparametric statistical methods. Topics will include, but are not restricted to, contingency table analysis, goodness-of-fit tests, simple linear and multiple regression, curvilinear regression, logistic regression, design and analysis of single and multifactor experiments, and introduction to multivariate statistics.

**Special Note:** Not available for credit to students who have taken STAT A410. Students will be required to design a research project, analyze its data and write a professional-quality term paper.

**Registration Restrictions:** Graduate standing or instructor approval

**May Be Stacked With:** STAT A410