**Management Science (MSD)**

**MSD 104 Intro to Quantitative Methods** 3 Credits  
The aim of this course is to give students the preparation in algebra needed for successful completion of other required courses in management sciences and the functional areas of business administration. Topics covered include linear and quadratic equations and functions, systems of linear equations, exponential functions, logarithms, linear inequalities, radicals, percent change, scientific notation and scientific digits.  

**Prerequisite:** MSD 104 or a passing grade on the Math Placement Exam.

**MSD 105 Math for Actuarial Science I** 3 Credits  
The first of two courses designed to give the actuarial science student the necessary background in calculus. Topics include a brief review of a function, and introduces limits and continuity, the derivative and its applications, implicit differentiation, differentiating an inverse function, differentials, related rates, curve sketching, optimization problems, L'Hopital's rule, and an introduction to the indefinite integral. Fall.

**MSD 110 Math for Actuarial Science II** 3 Credits  
A continuation of MSD 110. Topics include the definite integral and the fundamental theorem of calculus, change-of-variable theorems, the area between two graphs, integration by parts, improper integrals, infinite series, partial differentiation of a function of two variables and its optimization applications, and the double integral of a function of two variables.

**MSD 200 Statistical Methods I** 3 Credits  
This course is designed to give the student an understanding of continuous random variables, the elements of statistical inference, and an introduction to how these tools may be useful in one’s attempt to reach intelligent conclusions in real-world settings. The focus is on the normal random variable, descriptive statistics, sampling distributions, and the frameworks of estimation and hypothesis testing, particularly as they apply to inference for unknown population means and proportions in the one- and two-sample settings.  

**Prerequisite:** MSD 105 or equivalent.

**MSD 201 Statistical Methods II** 3 Credits  
The sequel to Statistical Methods I is designed to prepare the student to be able to recognize a variety of additional common inferential scenarios, select and apply appropriate techniques in their analyses, and be aware of the usefulness of computer packages in performing certain relatively complicated statistical calculations. The course covers the one-way analysis of variance, Chi-square tests for non parametric inferences, and regression analysis. Students are expected to submit, for evaluation, the analysis of a real-world data set.  

**Prerequisite:** MSD 200.

**MSD 202 Quantitative Methods for Business Forecasting** 3 Credits  
A study of the various quantitative techniques applicable to the problems of forecasting that occur in business and industry. Topics may include the regression techniques of causal modeling, as well as the moving average, exponential smoothing, and Box-Jenkins approaches of time series analysis. All methods are illustrated with the use of realistic forecasts.  

**Prerequisite:** (s): MSD 201 or MTH 341.

**MSD 325 Regression/Analysis Variance** 3 Credits  
This course examines the use of applied linear statistical models to adequately describe practical relationships in business and economics. The implementation of a popular statistical computing package to analyze realistic data sets is an important component of the course. Topics include simple and multiple linear regression, model diagnostics and remedial measures, and the analysis of variance.  

**Prerequisite:** (s): MSD 201 or MTH 341.

**MSD 340 Production and Operations** 3 Credits  
This course introduces the concepts and techniques of designing and managing manufacturing and service systems and their operations effectively and efficiently. Major topics include product and process design, facility location, forecasting, aggregate planning, inventory management, supply chain management, project management, just-in-time systems, quality assurance, linear programming, and the transportation problem. Current issues such as productivity, global competitiveness, and quality are also discussed.  

**Prerequisite:** (s): MSD 105 or MSD 110, MSD 200 or MTH 340, MSD 201 or MTH 341.

**MSD 490 Independent Research and Study** 3 Credits  
Topic to be approved by professor and chairperson. Available for juniors and seniors. No more than 12 credits allowed toward graduation.

**MSD 491 Summer Mgt Sciences Internship** 3 Credits  
An honors course that provides the student with approximately two months of supervised employment with participating companies. Students are given a variety of work experiences. They are required to complete a term paper and to make an oral presentation to the faculty. Grading is on a pass/fail basis.  

**Prerequisite:** (s): Permission of instructor.