Statistics Requirement for MSIE Students

The statistics requirements below in general will meet the requirements for most focus areas in IE. However, students should consult with their MSIE advisor so as to take the course that best supports their degree program.

Students who have not had an undergraduate Experimental Statistics course (IE4362 or equivalent) must take one of:
- IE 4362 Advanced Statistics
- EXST 7013 Statistical Inference II

Students who have had an Experimental Statistics course undergraduate must take one of the following
- EXST 7011 Nonparametric Statistics
- EXST 7034 Regression Analysis
- EXST 7036 Categorical Data Analysis
- EXST 7037 Multivariate Statistics
- EXST 7039 Statistical Methods for Reliability and Survival Data
- EXST 7142 Statistical Data Mining

Course descriptions for these appear below.

EXST 7011 Nonparametric Statistics (3). *Prereq.: EXST 7003 or EXST 7004 or EXST 7005 or equivalent.* Nonparametric one- and two-sample location and distribution tests, including binomial, chi-square, Kolmogorov-Smirnov, Mann-Whitney U, Wilcoxon; analyses of variance, including Cochran's Q, Kruskal-Wallis, Friedman; correlation and regression, including Kendall's tau, Spearman's rho and point biserial.

EXST 7034 Regression Analysis (3). *Prereq.: EXST 7013 or EXST 7014 or EXST 7015 or equivalent and knowledge of matrix algebra.* Fundamentals of regression analysis, stressing an understanding of underlying principles; response surfaces, variable selection techniques and nonlinear regression.

EXST 7036 Categorical Data Analysis (3). *Prereq.: EXST 7013 or EXST 7014 or EXST 7015 or equivalent.* Statistical techniques used in analyzing data from discrete distributions; contingency tables, loglinear and logit models, logistic regression and repeated measures for nominal and ordinal data; emphasis on computer analysis and interpretation

EXST 7037 Multivariate Statistics (3). *Prereq.: EXST 7013 or EXST 7014 or EXST 7015 or equivalent and knowledge of matrix algebra.* Comparison of multivariate techniques and analyses; emphasis on discriminant analysis, factor analysis and principal component analysis, canonical correlation, cluster analysis and multivariate analysis of variance.

EXST 7039 Statistical Methods for Reliability and Survival Data (3). *Prereq.: EXST 7013 or EXST 7014 or EXST 7015 .* Characteristics of lifetime data; non-parametric methods including Kaplan Meier estimation; lifetime parametric models, parametric methods for single distribution data; planning life test; system reliability concepts; failure time regression; accelerated testing.

EXST 7142 Statistical Data Mining (3). *Prereq.: EXST 7013 , EXST 7014 , EXST 7015 , EXST 7019 or equivalent.* Data preparation; predictive modeling, including normal-based and logistic regression, decision trees, neural networks, ensemble methods; handling missing data; model assessment and model comparison; model implementation and scoring of new data; pattern discovery.