Applied Statistical Methods

The Applied Statistical Methods Graduate Certificate provides professionals with advanced skills and tools to collect data, analyze it, and interpret results across a wide variety of high tech companies.

What will I learn?

How to collect data, how to analyze and summarize data and how to interpret the results. The techniques learned in this certificate can be applied to quality control, production design and analysis, telecommunications, financial analysis, and risk analysis. This certificate will help the data analysts in conducting appropriate statistical analyses of their data and helping the technical supervisors in understanding the results of statistical analyses conducted by other people.

- Role and purpose of applied statistics. Data visualization and use of statistical software used in course. Descriptive statistics, summary measures for quantitative and qualitative data, data displays. Modeling random behavior: elementary probability and some simple probability distribution models. Normal distribution. Computational statistical inference: confidence intervals and tests for means, variances, and proportions. Linear regression analysis and inference. Control charts for statistical quality control. Introduction to design of experiments and ANOVA, simple factorial design and their analysis.
- Regression models and the least squares criterion. Simple and multiple linear regression. Regression diagnostics. Confidence intervals and tests of parameters, regression and analysis of variance. Variable selection and model building. Dummy variables and transformations, growth models. Other regression models such as logistic regression. Using statistical software for regression analysis.
- Role of sample surveys. Sampling from finite populations. Sampling designs, the Horowitz-Thompson estimator of the population mean. Different sampling methods, simple random sampling, stratified sampling, ratio and regression estimates, cluster sampling, systematic sampling.
- Statistically designed experiments and their importance in data analysis, industrial experiments. Role of randomization. Fixed and random effect models and ANOVA, block design, latin square design, factorial and fractional factorial designs and their analysis.
- Communicating with scientists in other disciplines. Statistical tools for consulting. Using statistical software such as JMP, SAS, and S-plus. Case studies which illustrate using statistical methodology and tools are presented by the instructor and guest speakers from academia and industry.
- Time series models, smoothing, trend and removal of seasonality. Naive forecasting models, stationarity and ARMA models. Estimation and forecasting for ARMA models. Estimation, model selection, and forecasting of nonseasonal and seasonal ARIMA models.

Why study Applied Statistical Methods at NJIT?

The graduate certificate's narrow focus allows you to dig deep into this specific topic, and start applying your knowledge sooner. Earn this certificate on our NJIT Newark campus. And you'll learn from NJIT's distinguished professors and instructors.

Prerequisites

Applicants must have an undergraduate degree from an accredited institution with at least 12 credits in mathematics, including calculus. Students who do not meet these requirements may be admitted if they satisfy the university's requirements for admission. An undergraduate GPA of at least 3.0 on a 4.0 scale or equivalent is normally required.

Related Degree Programs

All credits for the Applied Statistical Methods Certificate relate in their entirety to the NJIT MS in Applied Statistics (http://catalog.njit.edu/graduate/science-liberal-arts/mathematical-sciences/applied-statistics-ms/).

Gainful Employment Disclosure

Click here (http://www.njit.edu/graduatestudies/sites/graduatestudies/files/gainfulemployment/applied-statistical-methods-cert-gainful-employment.html) for the Gainful Employment Disclosure for this program.

What are the Required Courses?

Code	Title	Credits
Core Courses		
MATH 661	Applied Statistics	3
MATH 644	Regression Analysis Methods [*]	3
Electives		
Select two of the following:		6
MATH 698	Sampling Theory	
MATH 699	Design and Analysis of Experiments	

MATH 664	Methods for Statistical Consulting
MATH 646	Time Series Analysis

*   indicates as available online