

# ANL321 Statistical Methods

**Level:** 3

**Credit Units:** 5 Credit Units

**Language:** ENGLISH

**Presentation Pattern:** EVERY JULY

## Synopsis:

ANL321 Statistical Methods explores the mathematical foundation of statistical inference and approaches. It begins with an introduction to basic mathematics for statistics, and then, to random variables and probability, the formulation of estimators and their properties, and regression models and their different variations. Students will learn statistical design thinking towards the estimation and identification of causality. They will learn the various pitfalls in regressions and the formulation of appropriate regression solutions to address various business and policy challenges. Students are expected to have mathematical foundations in calculus and should have attained a good grade in an undergraduate Statistics module (e.g., BUS105) as this course assumes fundamental knowledge in Statistics.

## Topics:

- Probability
- Random Variables
- Measures of Central Tendency, Dispersion and Association
- The Conditional Expectation
- Elements of Finite Sample Properties and Asymptotic Theory
- Confidence Intervals and Hypothesis Testing
- The Linear Regression and the Method of Least Squares
- The Assumptions and Properties of Least Squares Estimators
- Regression through the Origin, Omitted Variable Bias, Multicollinearity
- Inference in Linear Regression
- Further Issues in Regression Analysis
- Introduction to Maximum Likelihood Estimation

## Textbooks:

ANL321 Study Guide (UDC - SUSS) SUSS  
ISBN-13: SG-1642

JMP Pro for Academic Multi-Use (JMP18) 18th JMP Statistical Discovery LLC  
ISBN-13: SW-0254

**Learning Outcome:**

- Explain relevant concepts used in the various statistical methods
- Describe the relevant data and assumptions to be used for the various statistical models
- Determine the relevant statistical methods to use for a given business problem and data structure
- Appraise the advantages and disadvantages of using various statistical methods
- Implement the various statistical methods using appropriate statistical software
- Interpret the results of using the various statistical methods
- Evaluate the results of using the various statistical methods

**Assessment Strategies - Regular Semester (Evening Class):**

<b>Components</b>	<b>Description</b>	<b>Weightage Allocation (%)</b>
Overall Continuous Assessment	PARTICIPATION 1	10
	TUTOR-MARKED ASSIGNMENT 1	20
	GROUP BASED ASSIGNMENT 1	20
Overall Examinable Components	Written Exam	50
<b>Total</b>		<b>100</b>

\*The information listed is subject to review and change.