

Advanced Consumer Behavior Analytics

Stochastic Models, Predictive Engineering and Quantitative Choice Theory

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Level: Master of Science

Course Overview

This graduate-level curriculum bridges advanced multivariate statistics with consumer behavioral science. The framework trains students to engineer predictive models and deploy discrete choice theories to isolate drivers of human choice under complex market scenarios.

Core Methodological Modules

1. Multiple Regression & Path Analysis

Advanced estimation of simultaneous linear relationships. Resolution of multicollinearity via Variance Inflation Factors (VIF). Extensions to recursive Path Analysis and the estimation of direct, indirect, and total structural effects.

2. Logistic Regression & Binary Choice Models

Estimation of non-linear maximum likelihood functions. Log-odds transformations, Wald statistics, and interpretation of odds ratios. Evaluation of predictive accuracy through classification matrices and ROC curve analysis.

3. Multinomial Logit Discrete Choice Theory

Foundations of Random Utility Theory. Mathematical formulation of Multinomial and Conditional Logit models. Estimation of choice probabilities, marginal effects, and testing the Independence of Irrelevant Alternatives (IIA) assumption.

4. Conjoint Analysis & Perceptual Mapping

Decomposition of consumer preferences via trade-off matrices. Full-profile conjoint experimental designs, part-worth utility estimation, and simula-

tion of market share scenarios. Multidimensional Scaling (MDS) for geometric brand positioning.

5. Structural Equation Modeling (SEM) Baselines

Introduction to covariance-based structural equations. Integration of measurement models (CFA) and structural pathways. Evaluation of global goodness-of-fit indexes (*RMSEA*, *CFI*, *TLI*) and parameter identification constraints.