QMMS - QUANTITATIVE METHODOLOGY: MEASUREMENT AND STATISTICS

QMMS410 Classroom Assessment (3 Credits)
Developing and using classroom assessments, including tests, performance assessments, rating scales, portfolios, observations and oral interactions; basic psychometric statistics; standard setting; grading; communicating assessment information; testing ethics; locating and evaluating measures; program evaluation and classroom research; assessments used for educational policy decisions.
Restriction: Junior standing or higher.
Formerly: EDMS410.

QMMS489 Field Experiences in Measurement and Statistics (1-4 Credits)
Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.
Restriction: Permission of EDUC-Human Development and Quantitative Methodology department.
Repeatable to: 4 credits.

QMMS498 Special Problems in Measurement and Statistics (1-3 Credits)
Available only to education majors who have formal plans for individual study of approved problems.
Restriction: Permission of EDUC-Human Development and Quantitative Methodology department.
Repeatable to: 6 credits.

QMMS610 Classroom Assessment and Evaluation (3 Credits)
Develop the understandings and skills needed to validly, reliably, and accurately assess student learning and to provide focused leadership in the area of classroom assessment.
Credit Only Granted for: EDMS610 or QMMS610.
Formerly: EDMS610.

QMMS622 Theory and Practice of Standardized Testing (3 Credits)
Principles of interpretation and evaluation of aptitude, achievement, and personal-social instruments; theory of reliability and validity; prediction and classification; norm- and criterion-referenced testing concepts.
Prerequisite: QMMS451, QMMS645, EDMS451, or EDMS645 .

QMMS623 Applied Measurement: Issues and Practices (3 Credits)
Test theory and its application at an intermediate level. Item analysis, reliability and validity evidence, elements of generalizability theory, factor analysis, and item response theory, measurement invariance, and test equating.
Prerequisite: QMMS410 and QMMS645.
Credit Only Granted for: EDMS623 or QMMS623.
Formerly: EDMS623.

QMMS626 Instrumentation (3 Credits)
Theory, development, and applications of various affective, cognitive, or behavioral measurement instruments and procedures, including questionnaire and test items, observational protocols, and cutting-edge innovative game and scenario-based assessments.
Prerequisite: QMMS623.
Credit Only Granted for: EDMS626 or QMMS626.
Formerly: EDMS626.

QMMS645 Foundations of Quantitative Research Methods (3 Credits)
Research design and statistical applications in educational research: data representation; descriptive statistics; estimation and hypothesis testing. Application of statistical computer packages is emphasized.
Credit Only Granted for: EDMS645 or QMMS645.
Formerly: EDMS645.

QMMS646 Regression Analysis for the Education Sciences (3 Credits)
Theory and application of multiple linear regression. Estimation and interpretation of regression coefficients, models with discrete predictors (e.g., analysis of covariance), interaction and polynomial terms, model evaluation and comparison, and detection of outliers and influential cases.
Prerequisite: QMMS645 or EDMS645; or an equivalent introductory statistics course.
Credit Only Granted for: QMMS646 or EDMS646.
Formerly: EDMS646.

QMMS647 Causal Inference and Evaluation Methods (3 Credits)
Research designs and statistical methods for impact evaluation. Theory and application of randomized experiments, propensity score matching, difference-in-differences, interrupted time-series analysis, instrumental variables, and regression discontinuity designs
Prerequisite: Must have completed or be concurrently enrolled in QMMS651.
Credit Only Granted for: EDMS647 or QMMS647.
Formerly: EDMS647.

QMMS651 Regression Analysis for the Education Sciences II (3 Credits)
A follow-up course of Regression Analysis for the Education Sciences I, focusing on various theoretical extensions of multiple linear regression and their applications. Topics include the weighted least square and maximum likelihood estimation, nonlinear regression, nonparametric regression, generalized linear models for discrete data (e.g., logistic and Poisson regression), and bootstrapping.
Prerequisite: QMMS646 or EDMS646; or students who have taken courses with comparable content may contact the department.
Credit Only Granted for: EDMS651 or QMMS651.
Formerly: EDMS651.

QMMS655 Introduction to Multilevel Modeling (3 Credits)
Introduction to multilevel/mixed effects/random effects models and methodology as strategies for modeling nested data in educational contexts.
Prerequisite: QMMS651; or students who have taken courses with comparable content may contact the department.
Credit Only Granted for: EDMS655 or QMMS655.
Formerly: EDMS655.

QMMS657 Exploratory Latent and Composite Variable Methods (3 Credits)
Development of models for exploratory factor analysis and their practical applications. Additional topics will draw from latent class analysis, cluster analysis, mixture models, classification and regression trees, and social network models.
Prerequisite: QMMS651.
Credit Only Granted for: EDMS657 or QMMS657.
Formerly: EDMS657.

QMMS665 Data Analysis and Statistical Consulting (3 Credits)
Advanced data analysis procedures applied to real-world clients' problems arising in a wide variety of substantive research settings within and beyond education.
Prerequisite: QMMS651; or students who have taken courses with comparable content may contact the department.
Credit Only Granted for: EDMS665 or QMMS665.
Formerly: EDMS665.

QMMS722 Structural Modeling (3 Credits)
Statistical theory and methods of estimation used in structural equation modeling; computer program applications; measured variable path models; confirmatory factor analysis; latent variable path models; multisample models; mean structure models; latent growth models; power in SEM.
Prerequisite: QMMS657.
Credit Only Granted for: EDMS722 or QMMS722.
Formerly: EDMS722.

QMMS724 Item Response Theory (3 Credits)
Theoretical formulations of measurement from a latent trait theory perspective.
Prerequisite: QMMS623 and QMMS651.
Credit Only Granted for: EDMS724 or QMMS724.
Formerly: EDMS724.

QMMS738 Seminar in Special Problems in Measurement (1-3 Credits)
An opportunity for students with special interests to focus in depth on contemporary topics in measurement. Topics to be announced, but will typically be related to applied and theoretical measurement.
Restriction: Permission of EDUC-Human Development and Quantitative Methodology department.
Repeatable to: 12 credits if content differs.
Formerly: EDMS738.

QMMS747 Design of Program Evaluations (3 Credits)
Analysis of measurement and design problems in program evaluations.
Prerequisite: QMMS626, QMMS651, and QMMS647.

QMMS769 Special Topics in Applied Statistics in Education (1-4 Credits)
Designed primarily for students majoring or minoring in Quantitative Methodology: Measurement and Statistics
Restriction: Permission of EDUC-Human Development and Quantitative Methodology department.
Repeatable to: 24 credits if content differs.
Formerly: EDMS769.

QMMS771 Multivariate Data Analysis (3 Credits)
Principal components, canonical correlation, discriminant functions, multivariate analysis of variance/covariance and other multivariate techniques.
Prerequisite: QMMS651.

QMMS779 Seminar in Applied Statistics (1-3 Credits)
Enrollment restricted to students with a major or minor in Quantitative Methodology: Measurement and Statistics. Seminar topics will be chosen by individual student interest.
Restriction: Permission of EDUC-Human Development and Quantitative Methodology department. And must be in Measurement, Statistics and Evaluation (Master's) program; or must be in Measurement, Statistics and Evaluation (Doctoral) program.
Repeatable to: 24 credits if content differs.
Formerly: EDMS779.

QMMS787 Bayesian Inference and Analysis (3 Credits)
Models and model fitting methods commonly used in Bayesian Inference, such as Markov Chain Monte Carlo methods (e.g., Gibbs, Metropolis Sampling), with applications within and beyond the social and behavioral sciences. Analytical and philosophical differences between Frequentist and Bayesian statistics will also be highlighted.
Prerequisite: QMMS779 or permission of the instructor.
Credit Only Granted for: EDMS787 or QMMS787.
Formerly: EDMS787.

QMMS798 Special Problems in Education (1-6 Credits)
Master's, QMMS majors, or doctoral candidates who desire to pursue special research problems under the direction of their advisors may register for credit under this number.
Restriction: Must be in Measurement, Statistics and Evaluation (Master's) program; or must be in Measurement, Statistics and Evaluation (Doctoral) program.
Repeatable to: 24 credits if content differs.
Formerly: EDMS798.

QMMS799 Master's Thesis Research (1-6 Credits)
Registration required to the extent of 6 credits.
Restriction: Must be in a major within the EDUC-Human Development and Quantitative Methodology department.
Repeatable to: 24 credits.
Formerly: EDMS799.

QMMS879 Doctoral Seminar (1-3 Credits)
Seminar that supports analysis of doctoral projects and theses, and of other on-going research projects.
Restriction: Permission of EDUC-Human Development and Quantitative Methodology department.
Repeatable to: 24 credits.

QMMS889 Internship in Measurement and Statistics (3-12 Credits)
Provides internship experiences at a professional level of competence in a particular role with appropriate supervision. Credit not to be granted for experience accrued prior to registration. Open only to students advanced to candidacy for doctoral degree.
Prerequisite: Open only to students advanced to candidacy for doctoral degree.
Restriction: Permission of EDUC-Human Development and Quantitative Methodology department.
Repeatable to: 24 credits.
Formerly: EDMS889.

QMMS898 Pre-Candidacy Research (1-8 Credits)
Pre-Candidacy Research for Doctoral Students
Repeatable to: 24 credits.
Formerly: EDMS898.

QMMS899 Doctoral Dissertation Research (1-8 Credits)
Registration required to the extent of 12 credits.
Repeatable to: 24 credits.
Formerly: EDMS899.