

# Quantitative Research Methods Student Handbook

Doctor of Philosophy

2007-2008



UNIVERSITY OF  
DENVER

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Morgridge College  
of Education

# TABLE OF CONTENTS

Contents	Pg
Introduction	3
Faculty and Staff	3
Honor Code	4
Quantitative Research Methods Program	5
Unique Program Features	5
Structure of the Morgridge College of Education	6
Degree Requirements	7
Course Requirements	11
Suggested Course Sequencing	13
Testing Out or Waiving Courses	13
Course Descriptions	14
Doctoral Comprehensive Examination	18
Doctoral Dissertation Policies	19
QRM Annual Review Form	21
QRM Doctoral Course Work Plan	23

The *University of Denver's Quantitative Research Methods Doctoral Student Handbook* provides the prospective and admitted student with the policies and procedures to progress through the requirements of the degree program. In addition to our program publication, the student should become familiar with the *Morgridge College of Education Bulletin*. Although every effort has been made to ensure their agreement, it is the student's responsibility to read the norms regarding degree programs in both documents and to complete various program steps in a timely fashion.

The University of Denver reserves the right to make changes in the regulations, courses, rules, fees or other changes in this handbook without advance notice.

Inquiries concerning the Quantitative Research Methods Program should be directed to the Office of Admissions and Enrollment Services, 2450 S. Vine St., Denver, CO 80208; Phone 303-871-2509 and [edinfo@du.edu](mailto:edinfo@du.edu).

The University of Denver (Colorado Seminary) is an Equal Opportunity Institution. It is the policy of the University not to discriminate in the admission of students, in the provision of services, or in employment, on the basis of race, color, religion, sex, national origin, age, marital or veteran status, sexual orientation, or physical or mental disability.

Inquiries concerning allegations of discrimination based on any of the above matters may be referred to the University of Denver Affirmative Action Office, 2020 E. Evans Ave., Room 104, Denver, CO 80208, 303-871-2307, or the U.S. Department of Education, Office of Civil Rights, 1244 Speer Blvd., Denver, CO 80204.

# INTRODUCTION

Welcome to graduate studies in Quantitative Research Methods (QRM). The goal of the QRM program is to enhance the development and use of research in the social and health sciences. Our goals as faculty are to equip you with cutting-edge research skills, creative educational vision, social responsibility, and sufficient experience in application of your skills and knowledge to achieve a feeling of comfort. We are committed to shaping a safe, sustainable, democratic, and just world and believe that high quality research is one approach to doing this. We are pleased to have you join us in this venture.

*Kathy E. Green*

## QUANTITATIVE RESEARCH METHODS FACULTY

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# UNIVERSITY OF DENVER HONOR CODE



Adopted by  
The Morgridge College of Education

**HONOR CODE STATEMENT** All members of the University community are entrusted with the responsibility of observing certain ethical goals and values as they relate to academic integrity. Essential to the fundamental purpose of the University is the commitment to the principles of truth and honesty. The Honor Code is designed so that responsibility for upholding these principles lies with the individual as well as the entire community.

The Honor Code fosters and advances an environment of ethical conduct in the academic community of the University, the foundation of which includes the pursuit of academic honesty and integrity. Through an atmosphere of mutual respect we enhance the value of our education and bring forth the highest standard of academic excellence. Members of the University community, including students, faculty, staff, administrators and trustees, must not commit any intentional misrepresentation or deception in academic or professional matters.

Refer to [http://www.du.edu/facsen/honor\\_code.html](http://www.du.edu/facsen/honor_code.html) for the entire honor code.

# QUANTITATIVE RESEARCH METHODS PROGRAM

This handbook provides information about the doctoral degree in Quantitative Research Methods. The doctoral program in QRM is individually planned around the students' backgrounds and career goals. Most students prepare for positions that require consulting, research, measure development, policy-making, and teaching. Small seminars, independent projects, and a practicum offer opportunities for an individualized and well-rounded program.

The program in QRM at the Ph.D. level focuses on measurement, research design, statistics, and evaluation. All Ph.D. students will take courses in Assessment and Development as well as major area studies. Doctoral students will also take dissertation credits.

## Unique Program Features

In addition to the facilities of the entire campus, there are three features of the QRM Program at DU that distinguish it as a strong graduate program. We are particularly fortunate to have an outstanding faculty. Professors are not only leaders in their fields but also demonstrate a deep commitment to students' academic as well as personal growth. While our professors set high standards for students, they also individualize requirements to meet each student's needs and goals.

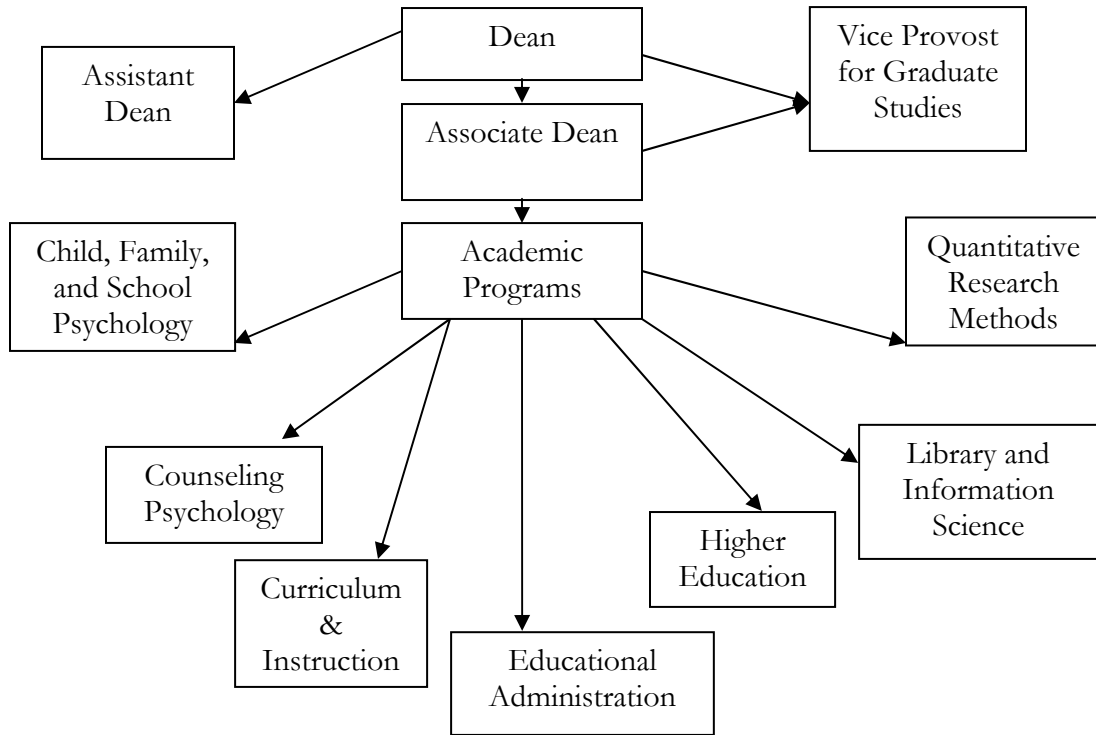
Another excellent feature of this program is the students themselves. A wide range of experiences, creative ideas, sincere dedication to research, and a sense of humor are some of the characteristics of people in our program. We enjoy each other's genuine cooperation, encouragement, and inspiration.

Small class sizes are the third distinguishing feature of our program. It is one that enables us to get to know one another and engage in ongoing dialogue about topics of interest, form study groups, and give advice about the direction of a project or dissertation. Personal and professional friendships form and continue long after graduate school.

These features contribute to an outstanding educational experience. We feel fortunate to be part of a program in which professors make themselves readily available for consultation, students support and assist one another, and small class sizes result in rich interaction among students and faculty.

The QRM program is one of seven programs offered within the Morgridge College of Education. Students may opt to take cognate courses from programs within or outside of the Morgridge College of Education. QRM students take classes with students in program from across the College. The College structure is pictured on the following page.

# STRUCTURE OF THE MORGRIDGE COLLEGE OF EDUCATION



# DEGREE REQUIREMENTS

## Doctor of Philosophy in Education

### *Transfer of Credit*

Make a formal request on the Course Work Plan for transfer of graduate credit. Confirm with the Office of Admissions and Enrollment Services that Official Transcripts are on file for institutions from which credit is to be transferred. These credits must be post M.A., cannot be over five years old when transferred, and must have a grade of "B" or better from an accredited institution. Maximum allowable transfer of credit is 15-quarter hours post-master's. The approval must be completed *in the first quarter* of enrollment. Consult your advisor; not all credit is transferable as the coursework may not reflect program goals.

### *Course Work Plan*

Draft a Course Work Plan with your advisor during your *first quarter* of enrollment and complete it by the end of your *third quarter* or before you have completed 30 credit hours of coursework. After it has the proper signatures, file it in the Office of Admissions and Enrollment Services, Ammi Hyde Building Room 124. If any changes occur in your course work plan during your program, request a Change of Course Work Plan form from the Office of Admissions and Enrollment Services, have your advisor approve all changes, then file it with the Office of Admissions and Enrollment Services. Changes to the plan may be made at any time based on discussion with your advisor.

### *Cognate Requirement*

All doctoral students must complete a cognate or minor study in a field outside their major area of study, determined in conjunction with the student's major course work advisor. The credits required to fill this obligation vary depending upon the student's prior graduate level course work (if any) in the minor field. The cognate should add to one's breadth or depth of knowledge in evaluation, research methods, and statistics. Graduate-level classes, chosen in consultation with an advisor, can be taken from (1) the QRM Program, (2) other programs within the Morgridge College of Education, or (3) any other department at University of Denver.

### *Practicum*

Students in the doctoral program complete a research practicum. Students work with their advisor in deciding the focus of this practicum. The goal of the practicum is to provide field experiences in designing, conducting, and presenting research. It is intended that every doctoral student will submit the paper written from the practicum for presentation at a national conference and/or publication.

### *Continuous Enrollment Policy*

Graduate students needing to establish loan eligibility while working on the dissertation once course work is completed can apply for Graduate Enrollment Certification (GEC). There is a fee per quarter, and the student must register for at least one credit per Fall, Winter, and Spring until graduation. **Please note there are two (2) Continuous Enrollment Policies; one for DU Graduate Studies and one for the Morgridge College of Education. Students *MUST* adhere to both. The DU policy is found at [www.du.edu/grad/grad\\_cs.html](http://www.du.edu/grad/grad_cs.html).**

### ***Morgridge College of Education Continuous Enrollment Policy***

Once the student has completed successfully all required courses and the required comprehensive exam, a student must register for dissertation credits. The faculty support students in the dissertation process by providing advising during this phase of the PhD. It is the expectation of the faculty that each student will successfully complete the required dissertation with quality work. In order to encourage the completion of the dissertation, the policy requiring continuous enrollment is as follows:

**A student is required to remain continuously registered for dissertation credit at the minimum rate of one credit per quarter (Academic Year of Fall, Winter, and Spring quarters), until the student has completed the minimum necessary number of dissertation hours required by the student's program AND a successful dissertation defense has occurred. Therefore, depending on the time a student takes to successfully complete the dissertation, additional dissertation credits may be necessary beyond the required minimum. Students must follow the Morgridge College of Education Continuous Enrollment Policy.**

### ***Doctoral Dissertation***

Students should refer to the Morgridge College of Education's dissertation handbook, known as *Completing the Doctoral Dissertation: Guidelines for Students*, which can be found on the MCE website, <http://www.du.edu/education/currentStudents/dissertations.html>. Students should refer to this document as the definitive word on MCE dissertation policies and procedures.

### ***Dissertation Proposal Approved***

The doctoral candidate will develop a dissertation proposal and present it to his/her dissertation committee. After approval of the dissertation proposal, each committee member will sign the approval page, which should then be filed in the Graduate Office.

### ***Institutional Review Board (IRB)***

All studies and experiments involving human subjects conducted by the Morgridge College of Education faculty, staff, or students, under the auspices of the College and not under a sponsored agreement through the University, must gain prior approval from the Institutional Review Board (IRB). Anyone who conducts studies or experiments involving human subjects without such approval may be personally responsible for legal or other liabilities that may consequently arise. A Procedures for Research Proposal Review packet outlines the specific procedures for human subjects approval and also contains the application that is to be submitted to the Review Board. Anyone submitting an application to the IRB must first complete an examination on human subjects history, rules, and regulations. For more information view the website at: [ww.du.edu/osp/irb.html](http://ww.du.edu/osp/irb.html). Further, it is the student's responsibility to be sure IRB approval, once obtained, remains current through submission of an approved dissertation. Changes in the student's email, phone, or mailing address, change in the committee chairperson should be reported to the IRB.

### ***Final Candidacy***

Students must achieve final candidacy at least one quarter prior to the quarter in which they intend to graduate. Final candidacy includes completion of all of the above requirements.

### ***Dissertation Completion***

Complete the doctoral dissertation and schedule the oral examination following the guidelines available in the Office of Admissions and Enrollment Services.

### ***Residence Requirement***

A student must meet residence requirements by enrollment for at least six quarters.

### ***Registration for Graduation***

All students must apply for graduation one quarter prior to the quarter in which they intend to graduate. Applications are available in the Education Graduate Office, Ammi Hyde Room 124, or in the Graduate Studies Office in University Hall Room 216. During the quarter of intended graduation, students should be sure that all library fines, traffic tickets, or other encumbered charges have been paid.

### ***Extension of a Degree Program***

Candidates for all degree programs are expected to complete their degree within the stated expected time period specified by the University of Denver. This time period is calculated from the date of initial enrollment in the student's program of study. Students may, under special circumstances, request one period of extension, not to exceed one year. Extension requests are not automatically granted and must be considered extraordinary circumstances. All requests for extension must be submitted to the Office of Admissions and Enrollment prior to the expiration of the allotted time period. Students who do not complete their program during an approved extension period will not be permitted to re-apply for additional extensions and their program of study will be terminated. Specific procedures for an extension of a degree program can be found in the MCE Bulletin.

### ***Ethical Behavior and Conduct***

Most students understand that copying another student's answers on a test, copying another student's paper, stealing copies of a test, using forbidden material on a closed book test, etc., are included in the typical definition of academic cheating. Again, as students you should know such behavior is unacceptable and, according to the DU Honor Code, are grounds for placing a student on probation or dismissing them from the University. Please refer to the DU Honor Code: <http://www.du.edu/ccs/honorcode.html>.

Students are expected to demonstrate the highest level of ethical behavior as set forth by the American Psychological Association (APA).

In the QRM Program at the University of Denver, we have tried to maintain an atmosphere of student cooperation. As a result, students are often encouraged to work together on a project or to prepare for tests. Students prepare together for exams and often share notes, references, etc. On the other hand, it is and has been unacceptable in almost any academic setting to use other people's ideas or data without giving them credit. This is called plagiarism and is considered unethical according to the APA (2000) Code of Ethics. As a result, the Program faculty wants to clarify that it is similarly unacceptable in our Program to "borrow" another student's work without giving him or her credit. It is often the case that professors use similar or identical assignments from year to year. Usually, this is because they believe the assignments are useful in teaching students a particular concept or skill. Using papers written by others, or parts of papers, materials, and handing it in as your own work is

clearly unethical. It is tempting in the guise of friendship to pass on to new students copies of old assignments knowing that a professor will use the same one in future years. It is also tempting for new students to borrow copies of old assignments. Such behavior is, however, unfair to other students who do not have "friends" from whom to borrow assignments, to the student whose work is being "borrowed" without credit, and to the student who is "borrowing" the assignment since they do not have to do the learning involved in working through the assignment on their own. As a result, the faculty will consider such behavior to be cheating and it will be treated like other forms of cheating specified in the first paragraph.

Unethical behavior will be considered cause for dismissal at any time during a student's program. These policies are described more fully in the MCE Bulletin. Violations of code of student conduct or the honor code are overseen by the Office of Citizenship & Community Standards ([www.du.edu/ccs](http://www.du.edu/ccs)) in conjunction with an appointed DU Conduct Review Board. This office can be contacted with questions about these policies and procedures at 303-871-4851.

### ***Probation or Dismissal from the Program***

Students who do not follow program or university policies may be placed on probation and ultimately dismissed from the program. While these instances are rare, should they occur, students first will be contacted by their advisor and then will be informed in writing of all concerns that have been raised. In other words, students will be told specifically and in writing of any issues in regards to academic progress or attendance, interpersonal or practice effectiveness, or ethical violations. Students also will be asked to respond to these concerns personally and in writing. Decisions regarding probation or dismissal will be considered by the Program Director and QRM faculty in consultation with the MCE Associate Dean. Students will be informed of all pertinent information regarding the basis for the decision.

### ***Grievance Process***

If a student has a grievance involving a faculty member, it is preferable for the student to work it out with the faculty member. Students' advisors may act in a consultative role in this process. If students cannot work out the grievance directly with the faculty member, the student may direct his/her concern to the QRM program faculty by contacting the Program Director or other QRM faculty personally or in writing. If the grievance is not solved to the student's satisfaction, the student may appeal through the regular University grievance procedure by contacting the Associate Dean of the Morgridge College of Education. Students placed on probation or dismissed from the program have the right to appeal by following the DU appeal procedure outlined in the MCE Bulletin. Grievance and due process procedures for all grading, retention, and dismissal procedures are available in the MCE Admissions and Dean's Office.

## COURSE REQUIREMENTS

### QRM Doctor of Philosophy Degree

All students are required to complete a course plan with their advisors. Doctoral students will take courses in Assessment, QRM, and dissertation research. Students are also required to take courses in related studies or a cognate field. The minimum credit requirement for the program is 90-quarter hours. Students may transfer a maximum of 15-quarter hours above the M.A. degree if the courses have been taken within five years and are approved for transfer. Approval of advisor is required. Courses marked with an asterisk (\*) are required unless previously taken, and all waived courses must be approved by an advisor within the first quarter of enrollment.

### QRM Doctor of Philosophy Course Requirements

<b>I. Research Requirements</b>	<b>Course #</b>	<b>Credit Hours</b>
*Educational Measurement (or QRM 4905 Psychometric Theory)	QRM 4900	3
*Empirical Research Methods	QRM 4903	3
* Structural Foundations of Research in Social Sciences	QRM 4920	3
*Statistical Methods in Education and Psychology	QRM 4930	5
*Qualitative Research	CUI 4951	3
*Dissertation Research (must register for at least 1 hr per Fall, Winter & Spring after most coursework is completed until Graduation)	QRM 5995	10 minimum
Total Research:		27 minimum
<b>II. Program Requirements</b>		
<b>A. Assessment (choose one)</b>		
Psychoeducational Assessment I	CFSP 4322	5
Psychoeducational Assessment II	CFSP 4323	5
Psychological Assessment	CNP 4704	5
Neuropsychological Assessment	CNP 4796	3
Social-Emotional Assessment	CFSP 4323	5
Play-Based Assessment and Intervention	CFSP 4334	5
Advanced Play Assessment and Intervention	CFSP 4341	2
Total Assessment:		2 - 5
<b>B. Measurement (*required)</b>		
* Psychometric Theory	QRM 4905	3
*Item Response Theory	QRM 4909	3
*Meta Analysis in Social Sciences Research	QRM 4907	2
Topics in Psychometrics (optional)	QRM 4906	3
Total Measurement:		8

<b><i>C. Research Methods (* required)</i></b>	<b>Course #</b>	<b>Credit Hours</b>
* Program Evaluation Theory	QRM 4980	3
Choose at least two of the following:		
Educational Criticism and Connoisseurship	CUI 4057	3
Ethnographic Research	CUI 4059	3
Survey Research Methods	QRM 4921	3
Single Case Research Designs	CFSP 4364	3
Topics in Research Design	QRM 4908	3
Community Based Research in Urban Settings	CUI 4036	3
Total Research Methods:		9
<b><i>D. Statistics (* required)</i></b>		
*Correlation & Regression (or PSYC 4300)	QRM 4952	4
*Analysis of Variance (or PSYC 4330)	QRM 4960	5
*Multivariate Analysis	QRM 4950	5
*Hierarchical Linear Modeling	QRM 4956	3
* Structural Equation Modeling (or PSYC 4290)	QRM 4925	5
*Latent Growth Curve Modeling	QRM 4957	3
Recommended:		
Topics in Statistics	QRM 4955	3
Sampling Theory and Applications	STAT 4680	4
Nonparametric Statistics	STAT 4810	4
Total Statistics:		25
<b>III. Practicum</b>		
Research Practicum	QRM 4901	3
<b>IV. Cognate Requirements</b>		
Total of 20 credit hours:		20

<b>PhD Requirements</b>	<b>Credits Required</b>	<b>Credits Completed</b>
<b>I. Research</b>	<b>27</b>	
<b>II. Program Requirements</b>		
<b>A. Assessment</b>	<b>2-5</b>	
<b>B. Measurement</b>	<b>8</b>	
<b>C. Research Methods</b>	<b>9</b>	
<b>D. Statistics</b>	<b>25</b>	
<b>III. Practicum</b>	<b>3</b>	
<b>IV. Cognate Requirement</b>	<b>20</b>	
<b>Total</b>	<b>Minimum 90 hours</b>	

## SUGGESTED COURSE SEQUENCING

The recommended sequence for the statistics courses are listed below. Please note that courses are typically offered in the quarter noted. However, course offerings are subject to change based faculty availability and student enrollments.

1. QRM 4930 or equivalent (Fall quarter)
2. QRM 4952, (Fall & Winter) and QRM 4960 (Winter)
3. QRM 4950 (Spring quarter)
4. QRM 4925, QRM 4956 (offered alternate years)
5. QRM 4955 (offered periodically)

For measurement courses, the recommended sequence is:

1. QRM 4905 (Winter quarter)
2. QRM 4906 (Fall every second year) and QRM 4907 (Spring every second year)

For research courses, the recommended sequence is:

1. QRM 4920 (offered Fall)
2. QRM 4903, QRM 4921, QRM 4951
3. CFSP 4364 (offered periodically)

## TESTING OUT OR WAIVING COURSES

Students may waive QRM 4900, QRM 4903, QRM 4930, or CUI 4951 if they have taken comparable coursework within 5 years with a grade of “B” or better. Students may also attempt to test out of these courses. There is a fee to register for each course test-out exam; consult the MCE Office of Admissions and Enrollment Services. Students may *not* waive or test out of QRM 4920.

## COURSE DESCRIPTIONS

The following are descriptions of Morgridge College of Education courses you might take as a part of your degree program. *For complete and current course schedules and descriptions, please refer to the Morgridge College of Education web site at [www.du.edu/education](http://www.du.edu/education).*

***CUI 4059 Ethnographic Research*** 3 qtr. hrs

Explores ways in which ethnographers describe and explain experience of people in educational settings.

***CUI 4951 Qualitative Research Methods*** 3qtr. hrs

This course emphasizes conceptual and theoretical issues in qualitative research.

***CFSP 4312 Learning Application and Analysis*** 3qtr. hrs

Examines a range of learning theories from the 19<sup>th</sup> to the 21<sup>st</sup> centuries. Theories are applied to case studies.

***CFSP 4314 The Nature of Intelligence*** 3qtr. hrs

Explores the nature of human intelligence especially as it relates to the concept of giftedness. Specific topics include the history of interest in intelligence and giftedness; historical and current conceptualizations of intelligence; theories and models of intelligence currently influencing gifted education, such as information processing models, multiple intelligences, the general intelligence factor, and others; the measurement of intelligence; and educational implications of exceptional intelligence.

***CFSP 4363 Program Development and Evaluation*** 3qtr. hrs

Focuses on program development and evaluation in school and agency settings. Both qualitative and quantitative methods of program evaluation are discussed.

***CFSP 4364 Single-Subject Designs*** 3 qtr hours.

This course reviews alternatives to the group-comparison approach to experimental educational and psychological research. Students learn principal 'within-subject' or 'single-case' designs: the reversal design, the multiple-baseline design, the alternating treatment design, and the changing criterion design. Students also learn how to develop a measurement system to analyze data using these designs and how to assess the reliability and validity of their measurements.

***QRM 4900 Educational Measurement*** 3 qtr. hrs

This course examines the meaning, characteristics, and processes of educational measurement and evaluation. Development and interpretation of both standardized and informal tests are considered.

***QRM 4901 Practicum in Research*** 1-3 qtr. hrs

This course provides a supervised experience in design and implementation of an empirical research study. Organization of research proposal, completion of human

subjects applications, collection and analysis of data are emphasized. Students are also expected to prepare a written report of their project, which is suitable for professional presentation or publication. Prerequisite: permission of instructor.

***QRM 4903 Empirical Research Methods*** 3 qtr. hrs

This course provides in depth study of empirical research requirements involved in experimental, quasi-experimental, correlational, and single-subject designs.

***QRM 4905 Psychometric Theory*** 3 qtr. hrs

This course examines the major psychometric theories (e.g., classical, item response) as they relate to issues of reliability, generalizability, validity, item analysis methods, and criterion referenced assessment. Prerequisite: QRM 4930

***QRM 4906 Topics in Psychometrics*** 3 qtr. hrs

Topics vary, but include dichotomous Rasch model, computer applications of item response theory, affective measure construction, generalizability theory, additive conjoint measurement and standard setting. Prerequisites: QRM 4905 and instructor's permission

***QRM 4907 Meta Analysis in Social Sciences Research*** 2 qtr. hrs

This course examines meta-analytic techniques in the social sciences. Included are discussions of review of critical databases, coverage of all major methods of data collection and analysis, and coverage of how best to present meta-analytic findings for publication.

***QRM 4908 Topics in Research Design*** 3-5 qtr. hrs

Topics vary by quarter, but may include new innovations in quantitative research design, best practices in single-subject design and analysis, or best practices in the analysis of change.

***QRM 4909 Item Response Theory*** 3 qtr. hrs

This course presents item response theory, with most attention to the Rasch model, and computer applications of item response theory. Prerequisites: QRM 4905.

***QRM 4910 Education Research and Measurement*** 4 qtr. hrs

This course is intended for Master's students in the Morgridge College of Education. Quantitative research designs, empirical methods of data collection and interpretation, and measurement issues in research are examined.

***QRM 4920 Structural Foundations of Research in Social Sciences*** 3 qtr. hrs

This is the introductory course on research methods for all PhD students in the Morgridge College of Education. Included are discussions of identification and development of problems for research; introduction to basic quantitative and qualitative methods of conducting research in educational and human service settings; and critical review of experimental, survey, case study, educational, historical, ethnographic, and criticism methods.

**QRM 4921 Survey Design and Analysis** 3 qtr. hrs

Survey techniques, item construction, sampling, maximizing response rates and data analysis; survey construction and data analysis required. Prerequisites: QRM 4920, 4930

**QRM 4925 Structural Equation Modeling** 5 qtr. Hrs

Major applications of and issues related to covariance structure modeling, specifically confirmatory factor analysis and latent variable path modeling; types of research applications for which covariance structure modeling analyses using computer program. Prerequisite: QRM 4952. Recommended Prerequisite: background in multivariate analysis, factor analysis, and psychometric theory.

**QRM 4930 Introductory Statistics** 5 qtr. hrs

This is the beginning statistics course and examines the use and interpretation of statistics in educational and human services research, including descriptive and inferential techniques.

**QRM 4950 Multivariate Analysis** 5 qtr. hrs

This course emphasizes a conceptual understanding of common multivariate statistical techniques as applied to research in education and the social sciences. Assumptions, limitation of techniques, and interpretation of findings are also stressed. Prerequisites: QRM 4920, 4930.

**QRM 4952 Correlation and Regression** 4 qtr. hrs

This course focuses on the study of correlation and multiple regression research designs and their application to educational and social science problems. Prerequisites: QRM 4920, 4930

**QRM 4955 Topics in Statistics I** 3 qtr. hrs

Topics vary by quarter, but may include analysis of longitudinal data, or techniques for dealing with missing data. Prerequisites: QRM 4952

**QRM 4956 Hierarchical Linear Modeling** 3 qtr. hrs

This course introduces models that extend multiple regression to analysis of nested data structures common in education and other social sciences. Application of these methods to various forms of multilevel data, including repeated measure (growth trajectory) data is emphasized. Prerequisites: QRM 4952.

**QRM 4957 Latent Growth Curve Modeling** 3 qtr. hrs

This course addresses advanced issues in longitudinal data analysis using structural equation modeling and hierarchical linear modeling with latent variables. Prerequisites: QRM 4925 (structural equation modeling) and QRM 4956 (hierarchical linear modeling).

**QRM 4960 Analysis of Variance** 5 qtr. hrs

This course examines one-way analysis of variance through factorial nested designs. Prerequisites: QRM 4920, 4930

**QRM 4970 *Statistical Applications on the Computer for the Social Sciences*** 3 qtr. hrs  
This course focuses on use of SPSS software and other appropriate software programs in the analysis of quantitative data. Prerequisites: QRM 4920, QRM 4930

**QRM 4975 *Computer Applications in Qualitative Research*** 3 qtr. hrs  
This course is a review of the assumptions of qualitative designs, types of qualitative approaches, and current data analysis techniques available through use of computer software.

**QRM 4980 *Program Evaluation Theory*** 3 qtr. hrs  
This course reviews theories of program evaluation designs and analysis, and current trends in evaluation.

**QRM 4981 *Practicum in Program Evaluation*** 3 qtr. hrs  
This course provides a supervised experience in designing, conducting, analyzing, and disseminating results of a program evaluation.

**QRM 5991 *PhD Independent Study*** 1-17 qtr. hrs  
This course allows PhD students in QRM to study a topic area independently in conjunction with cooperating faculty member.

**QRM 5992 *Directed Study*** 1-10 qtr. hrs.  
A permanent catalog course delivered on an individual basis when the course is not offered that term. Directed studies are approved under extenuating circumstances to provide an opportunity to complete a required course. Prerequisite: approval of instructor and faculty advisor, credit hours vary according to the catalog course taken.

**QRM 5995 *Dissertation Research*** 10 qtr. hrs. minimum  
This course is for PhD students in QRM who are engaged in completing their doctoral dissertation. Prerequisites: Advanced standing in the program.

# DOCTORAL COMPREHENSIVE EXAMINATION

## ***Purpose***

The purpose of the Ph.D. comprehensive examination is to allow students to demonstrate ability to integrate the information and knowledge of research, measurement, and statistical theory and practice acquired during the degree program. Registration deadlines are on the MCE website.

## ***Format***

The test will be taken over a two-day time period with a different set of questions for each day. You are expected to organize your writing to give equal time to each question and to include time to proofread your answers. Some questions will be required and there will be some choice among others.

## ***Evaluation Criteria***

### ***Accuracy in addressing the questions***

In writing your responses to the question it is important to address the questions that are asked, without omitting parts of a question and without answering questions that were not asked.

### ***Skill in defining issues***

Each of the questions presented will relate to a particular problem area in quantitative research methods. In order to give focus to your response you must be able to identify the particular issue or issues you are addressing.

### ***Clarity in stating your position***

While few questions can be answered by a simple yes or no as an expert in quantitative research methods you are often required to take what seems to be the best and or most responsible position in terms of the evidence you have available at that time. In writing your responses in this examination ask yourself if a reader is able to identify clearly and directly the point of view you are developing.

### ***Competence in applying information***

To take a position on an issue is more than to repeat your own biases. You need to provide evidence in the form of bibliographic references specific data and quotations (direct or indirect) from authorities to substantiate the points you make. As a scholar in the field you are expected to be able to demonstrate that your opinions are well informed.

### ***Clarity in writing***

At this level of study you should be able to express yourself in clear and direct prose. Are you developing your responses logically and coherently? Poorly stated and illogically presented responses obscure rather than illuminate. Can a reader follow the structure of your argument? Do you use correct grammar construction and form?

### ***Overall adequacy***

Do you address the issues, reveal insight into problems, and document your position adequately?

## **Examples of Comprehensive Exam Questions for Doctoral Students**

1. Differentiate among experimental, quasi-experimental, and correlational research

- designs in terms of control of extraneous variables and the validity of drawing causal inferences. Illustrate each design with an example.
2. Show how the internal consistency reliability MCEfficient (e.g., Cronbach's alpha) is derived from the assumptions of true-score theory.
  3. Compare and contrast multiple regression, canonical correlation, ANCOVA, and factor analysis in relation to the following:
    - a. Type of research question(s) appropriately addressed by each technique
    - b. Numbers and types of variables appropriate for the technique
    - c. Important assumptions (if any)
    - d. Important mathematical similarities and differences

## DOCTORAL DISSERTATION POLICIES

Dissertation credits are reserved for work on the dissertation, which generally occurs after a student has completed all required courses and after successful completion of the required comprehensive exam. In some programs, however, a student may be under the direct supervision of a faculty member and begin preliminary work on the dissertation. A student may register for dissertation credits before completing and passing the comprehensive exam under the following conditions: 1) if the student's Dissertation Advisor agrees to work directly with the student on a regular basis throughout the quarter in which the student is registering for dissertation credit; and 2) if the student is prepared and able to dedicate substantial work to dissertation planning and preparation. It is recommended that students become familiar with the University of Denver's continuous enrollment policy, which may be found at: <http://www.du.edu/grad/downloads/continuousEnrollmentPolicy.pdf> To conduct preliminary dissertation work, the student must have the support of the dissertation advisor. The dissertation credit form can be obtained from the Morgridge College of Education's Office of Admissions and Enrollment Services, where the eligibility for credit will be verified prior to obtaining the faculty advisor's required signature. The dissertation advisor or co-advisor must be a faculty member in the Quantitative Research Methods Program. **The student must register for dissertation credits during the first week of class of the quarter in which the work will be conducted.**

The policy regarding preliminary dissertation work is as follows:

**A student may register for no more than 50% of the minimum number of dissertation credits required by his/her program prior to the completion of all course work and comprehensive exams.** Dissertation credit, as with any credits, will not be refunded if the student does not successfully complete his/her dissertation, other required courses, or qualifying or comprehensive exams.

Once the student has completed successfully all required courses and the required comprehensive exam, a student must register for dissertation credits. The faculty support students in the dissertation process by providing advising during this phase of the Ph.D. It is the expectation of the faculty that each student will successfully complete the required dissertation with quality work. In order to encourage the completion of the dissertation, the policy requiring continuous enrollment is as follows:

**A student is required to remain continuously registered for dissertation credit at the minimum rate of one credit per quarter (Academic Year of Fall, Winter, and Spring quarters), until the student has completed the necessary number of dissertation hours required by the student's program AND a successful dissertation defense has occurred.**

Students should refer to the Morgridge College of Education's doctoral handbook, *Completing the Doctoral Dissertation: Guidelines for Students*, which can be found on the MCE website, <http://www.du.edu/education/currentStudents/dissertations.html>, for the definitive word on MCE dissertation policies and procedures.

## QRM Student Annual Review Form

The Annual Review must be completed each year. We will email it to you as an attachment so you can complete it in spring of your first year, then just update it yearly.

Student Name \_\_\_\_\_

Date \_\_\_\_\_

Your Course Work Advisor's Name \_\_\_\_\_

**Instructions:** We are asking students to take an active role in assessment by providing us with your self-assessment of (a) your progress in meeting educational goals and (b) your strengths and weaknesses as a developing research methodologist. Please complete and return this form along with the necessary additional typed pages to your advisor at the end of spring quarter following your first full year in the QRM doctoral program.

Program faculty will meet during the summer to review students' self-evaluations. Based on your self-evaluations as well as faculty members' observations of your progress in coursework and general professional development, you will receive a letter assessing your progress and providing any corrective feedback, recommendations, or requirements that may be necessary. A copy will be placed in your permanent file, along with your self-assessment.

**Note:** You will have to complete a similar form each year. We recommend you keep a hard copy as well as the original on disk so that you can revise as needed.

1. a) Current GPA \_\_\_\_\_

b) Number of credits completed at DU in the academic year just ended \_\_\_\_\_

2. The program requires that students conduct a pre-dissertation research project (the research practicum). Have you met your pre-dissertation research practicum requirement?

Yes \_\_\_\_\_ No \_\_\_\_\_ Partial \_\_\_\_\_

a) If "yes" or "partial," indicate research activity in which you participated.

b) Indicate where you presented or published the research, date of presentation, title of presentation and attach a copy of the program page listing your presentation from the meeting where you presented.

c) If "no," indicate a plan for completing this requirement.

3. Have you filed your **Course Work Plan**? Yes \_\_\_\_\_ No \_\_\_\_\_

4. Have you taken your comprehensive examination? Yes \_\_\_\_\_ No \_\_\_\_\_  
If "yes," year and quarter \_\_\_\_\_

If "no," when do you plan to take it? \_\_\_\_\_

5. If there were conditions, have they been met? Yes \_\_\_\_\_ No \_\_\_\_\_

If you have not met the conditions, when do you plan to do so?

\_\_\_\_\_

6. Are you registered for Continuous Enrollment and Dissertation credits?

Yes \_\_\_\_\_ No \_\_\_\_\_

If no, please go to the MCE Office of Admissions and Enrollment Services to register.

7. Has your dissertation proposal been approved? Yes \_\_\_\_\_ No \_\_\_\_\_

If "yes," list the Chairperson and the proposed title

\_\_\_\_\_ (chair)

\_\_\_\_\_ (title)

If "no," do you have a proposal chairperson? Yes \_\_\_\_\_ No \_\_\_\_\_

If "yes," list name of chairperson and topic

\_\_\_\_\_ (chair)

\_\_\_\_\_ (topic)

8. If you have completed your course work, have you submitted a timeline for completing your dissertation? Yes \_\_\_\_\_ No \_\_\_\_\_

9. List professional organizations of which you are a member.

10. List all presentations you have made at meetings or conventions of professional associations since entering the program - or that have been accepted for presentation or publication (note the date, co-authors, title of presentation, name of the association, and the city in which it occurred.)

**QRM Doctoral Course Work Plan  
2007-2008**

**Student Name:** \_\_\_\_\_ **ID#:** \_\_\_\_\_

<b>I. Research Requirements</b>	<b>Course #</b>	<b>Credit Hours</b>	<b>Quarter Completed</b>
*Educational Measurement (or QRM 4905 Psychometric Theory)	QRM 4900	3	
*Empirical Research Methods	QRM 4903	3	
* Structural Foundations of Research in Social Sciences	QRM 4920	3	
*Statistical Methods in Education and Psychology	QRM 4930	5	
*Qualitative Research	CUI 4951	3	
*Dissertation Research (must register for at least 1 hr per Fall, Winter & Spring after most coursework is completed until Graduation)	QRM 5995	10-30	
Total Research:		27 - 47	
<b>II. Program Requirements</b>			
<b>A. Assessment (choose one)</b>			
Psychoeducational Assessment I	CFSP 4322	5	
Psychoeducational Assessment II	CFSP 4323	5	
Psychological Assessment	CNP 4704	5	
Neuropsychological Assessment	CNP 4796	3	
Social-Emotional Assessment	CFSP 4323	5	
Play-Based Assessment and Intervention	CFSP 4334	5	
Advanced Play Assessment and Intervention	CFSP 4341	2	
Total Assessment:		2 - 5	
<b>B. Measurement (*a required)</b>			
* Psychometric Theory	QRM 4905	3	
*Item Response Theory	QRM 4909	3	
*Meta Analysis in Social Sciences Research	QRM 4907	2	
Topics in Psychometrics (optional)	QRM 4906	3	
Total Measurement:		8	
<b>C. Research Methods (* required)</b>			
* Program Evaluation Theory	QRM 4980	3	
Choose at least two of the following:			
Educational Criticism and Connoisseurship	CUI 4057	3	
Ethnographic Research	CUI 4059	3	
Survey Research Methods	QRM 4921	3	
Single Case Research Designs	CFSP 4364	3	
Topics in Research Design	QRM 4908	3	
Community Based Research in Urban Settings	CUI 4036	3	
Total Research Methods:		9	

D. Statistics (* required)	Course #	Credit Hours	Quarter Completed
*Correlation & Regression (or PSYC 4300)	QRM 4952	4	
*Analysis of Variance (or PSYC 4330)	QRM 4960	5	
*Multivariate Analysis	QRM 4950	5	
*Hierarchical Linear Modeling	QRM 4956	3	
* Structural Equation Modeling (or PSYC 4290)	QRM 4925	5	
*Latent Growth Curve Modeling	QRM 4957	3	
Recommended:			
Topics in Statistics	QRM 4955	3	
Sampling Theory and Applications	STAT 4680	4	
Nonparametric Statistics	STAT 4810	4	
Total Statistics:		25	
III. Practicum			
Research Practicum	QRM 4901	3	
IV. Cognate Requirements			
Total of 20 credit hours:		20	

PhD Requirements	Credits Required	Credits Completed
<b>I. Research</b>	<b>27-47</b>	
<b>II. Program Requirements</b>		
<b>A. Assessment</b>	<b>2-5</b>	
<b>B. Measurement</b>	<b>8</b>	
<b>C. Research Methods</b>	<b>9</b>	
<b>D. Statistics</b>	<b>25</b>	
<b>III. Practicum</b>	<b>3</b>	
<b>IV. Cognate Requirement</b>	<b>20</b>	
<b>Total</b>	<b>Minimum 90 hours</b>	

Student Signature: \_\_\_\_\_

Advisor's Signature: \_\_\_\_\_

Date: \_\_\_\_\_