

POLICY RESEARCH, EVALUATION, AND MEASUREMENT (PREM)

Graduate Degree Programs

Descriptions, Curricula, and Requirements¹

Graduate School of Education
University of Pennsylvania

Edited: September 10, 2006

The Graduate School of Education, in cooperation with other academic divisions of the University of Pennsylvania, sponsors a program of graduate studies for individuals with interests in statistics, measurement, evaluation, and policy research. The doctoral curriculum is oriented primarily to quantitative research, development, and applications in education and related social services fields. Two master's degree programs prepare graduates for mid-level research and evaluation positions in education and other social sectors. They also prepare master's students to pursue further graduate study at the Ph.D. level.

Opportunities for job placement following graduation include a remarkably wide range of possibilities. At the doctoral level, they include positions as directors in evaluation and analysis organizations, principal investigators of field studies, policy researchers and analysts, methodological consultants, measurement specialists, and college and university professors. Doctoral graduates are employed in federal, state, and local government agencies; private corporations; schools, colleges and universities; health, mental health, and family services agencies; and professional organizations. At the master's level, job opportunities in such organizations include technical and professional staff positions that involve statistical analyses, measurement, evaluation, and research. The program provides in-depth expertise in quantitative and experimental methods for research and program evaluation, with a range of opportunities for innovative and individualized graduate study.

THE UNIVERSITY OF PENNSYLVANIA

The University of Pennsylvania, founded by Benjamin Franklin in 1740, has long enjoyed a reputation for innovation and academic excellence. Its outstanding faculty and rich intellectual resources provide the student with a vital setting for learning and professional growth. The graduate

¹All requirements for the M.S., M.Phil.Ed., and Ph.D. degrees of the Graduate School of Education and the University of Pennsylvania apply to PREM degree curricula. This description of PREM is not a comprehensive summary of all such requirements, descriptions of most of which are found in the **STUDENT HANDBOOK** of the Graduate School of Education. Students and prospective students should be aware of the principles and degree requirements published in the current version of this **HANDBOOK**.

degree programs offered in Policy Research, Evaluation, and Measurement continue this spirit of excellence and seek highly qualified students from the U.S. and other countries.

PREM GRADUATE PROGRAMS

Master of Science (M.S.): Statistics, Measurement Assessment, and Research Technology

The Master of Science degree program in Statistics, Measurement, Assessment, and Research Technology (SMART) is designed for individuals who are preparing for success in information rich environments, especially research and assessment organizations that place high value on quality of evidence, statistical analysis, and the use of technology in producing evidence and informing policy. The program provides understanding and skills in data collection, management, and processing, measurement theory and test construction, survey design, assessment strategies, and statistical analysis and reporting.

The master's degree curriculum prepares graduates for mid-level research, testing, and evaluation positions in education, other professional fields, and the social sciences. It also prepares students to pursue advanced graduate studies, including the M.Phil. and Ph.D. levels.

Graduates are prepared to plan, generate, and manage sophisticated quantitative data bases, to import and merge data from diverse media, to transform data for subsequent statistical treatment, to conduct and interpret univariate and multivariate statistical analyses, to design and interpret surveys and measures of performance and ability, to evaluate programs and policies through quantitative studies, and to report results for dissemination and policy development. Relevant positions are found in testing and research units of public school districts and state departments of education, public and private research organizations, medical and pharmaceutical organizations, and state and federal criminal justice systems.

The 8-CU minimum requirement for the M.S. degree makes it convenient to complete all degree requirements for SMART in one academic year of full-time study. Studies leading to this M.S. degree include coursework, a research apprenticeship, and a written general examination in the content of SMART.

Coursework: The core content of master's level coursework includes statistical methods, measurement, evaluation, research technology, and policy research. A minimum of 8 courses is required for the M.S. degree, 7 of which constitute the SMART core. One elective course is selected in accordance with the student's career goals. The elective course is taken within the Graduate School of Education, but outside the Policy, Management, and Evaluation Division, to satisfy the School's distribution requirement. In addition, Ed. 667 (Introduction to Statistics), or its equivalent, is required prior to degree matriculation, or must be taken during the first term of study as a 9th CU for the M.S. degree. The M.S. degree then will require more than two full terms of

course registration since a maximum of 4 CUs per term is permitted. Courses required for the M.S. degree in SMART are:

| Fall Term | Spring Term |
|--|---|
| Ed 625 Data Processing and Analysis | Ed 767 Regression and Analysis of Variance |
| Ed 684 Measurement and Assessment | Ed 768 Measurement Theory and Test Construction |
| Ed 680 Evaluation of Policies, Programs and Projects | Ed 683 Survey Methods and Design |
| Ed 829 Policy Research Seminar | Ed ____ GSE Distribution Course |
| Research Apprenticeship | Research Apprenticeship |

Research Apprenticeship: Inasmuch as master’s degree students are preparing for careers in empirical research, primarily using quantitative methods, an integral part of the learning experience is completion of an individually-tailored research apprenticeship arranged in consultation with the student’s advisor. This arrangement will be by mutual agreement of the student, the student’s advisor, and perhaps an alternate faculty sponsor. Typically, the student will participate in significant aspects of faculty research in progress. The nature of the research apprenticeship will vary with the student’s preparation, the characteristics of the research, and the stage of the research. This experience involves a commitment of 6 hours per week for an academic year. The purpose is to provide the student with practical research experience on an ongoing basis during the course of master’s studies. The student may or may not be compensated for services rendered under the research apprenticeship, or might be compensated for part of the time. Performance in the research apprenticeship must be satisfactory, as certified by a student’s academic advisor, as a condition for admission to General Examination for the M.S. degree.

Research Requirement: Research experience is required of at least one term in duration that includes the preparation of at least one comprehensive scholarly or scientific paper. The research requirement is satisfied in multiple ways by the SMART program. First, the core content of the SMART curriculum is composed of courses of research character, each of which is one term in duration. Second, the apprenticeship experience represents supervised research and is of two terms duration. Third, the policy research review paper required by Education 829 (Policy Research Seminar) represents a comprehensive scholarly paper.

Masters General Examination: Toward the end of completion of course requirements, masters students are required to pass a general examination in the core content of SMART. Details of this examination requirement and procedures are stated in the current edition of the GSE Student Handbook.

Master of Philosophy in Educ. (M.Phil.Ed.): Policy Research, Evaluation, and Measurement²

The Master of Philosophy in Education (M. Phil.Ed.), with a specialization in Policy Research, Evaluation, and Measurement (PREM), is designed for professionals who have already earned a relevant conventional masters degree², and who wish to advance their mastery of scale development and validation, research design and controlled field trials, multivariate statistical analyses, and the production of high quality evidence for decision-making in public and organizational policy. Emphasis is placed on mentored research. This is a 6 CU (minimum) program with a required comprehensive examination and an empirical research project.

The M.Phil.Ed. degree curriculum prepares graduates for mid-level research and evaluation positions in education, other professional fields, and the social sciences,. Although it also prepares students to pursue further graduate study at the Ph.D. level, students who matriculate for the M.Phil.Ed. ordinarily will be most interested in earning the M.Phil.Ed. to enhance their career prospects at this level, and will not be inclined to seek more advanced study at the doctoral level.

Graduates are prepared to design, apply and interpret measures of attitude, behavior, and other social science, education and related phenomena; to validate, scale and equate such measures; to plan and conduct controlled field experiments; to apply and interpret advanced univariate and multivariate statistics; to evaluate programs and policies through quantitative studies; and to disseminate and interpret results for understanding and policy development. Relevant positions are found in city and state educational research institutions, public and private research organizations, medical and pharmaceutical organizations, and state and federal criminal justice systems.

The M.Phil.Ed. degree is ideal for students who wish to prepare for research careers in education and related fields. The 6-CU minimum requirement for this degree (after completion of a relevant conventional masters degree²) can be completed in one academic year of full-time study. Graduate study leading to the M.Phil.Ed. degree studies in PREM includes coursework, a research apprenticeship, independent empirical research, and a written comprehensive examination in the content of the degree.

² The M.Phil.Ed. degree is for students who wish to continue their graduate studies after having finished a relevant Master's degree at the University of Pennsylvania. The relevant master's degree for students who wish to pursue the M.Phil.Ed. with a specialization in PREM is the M.S. degree in Statistics, Measurement, Assessment, and Research Technology (SMART) offered by the Graduate Group in Education. Therefore, students admitted for study leading to the M.Phil.Ed. in PREM are expected to complete all course requirements for SMART. Students matriculating for the M.Phil.Ed. degree in PREM from outside the University of Pennsylvania must complete all course requirements for SMART and all program requirements for the M.Phil.Ed. However, students who have earned a Master's degree at another institutions will be allowed to transfer up to four applicable courses toward the minimum of 14 courses required for the M.Phil.Ed. (i.e., a minimum of 8 courses for the M.S., plus a minimum of 6 additional courses for the M.Phil.Ed.).

Coursework: The core content of coursework includes advanced statistical methods, measurement, research design, and completion of an independent research project. A minimum of 6 courses (after completion of a relevant conventional master's degree²) is required for the M.Phil.Ed. degree, 5 of which constitute the PREM core and 1 of which is an elective. Courses required for the two-year M.Phil.Ed. degree in PREM are:

Coursework Sequence Leading to M.Phil.Ed

| Fall Term | Spring Term |
|--|---|
| <u>First Year: Coursework for M.S. Degree in SMART or Equivalent</u> | |
| Ed 625 Data Processing and Analysis | Ed 767 Regression and Analysis of Variance |
| Ed 684 Measurement and Assessment | Ed 768 Measurement Theory and Test Construction |
| Ed 680 Evaluation of Policies, Programs and Projects | Ed 683 Survey Methods and Design |
| Ed 829 Policy Research Seminar | Ed ____ GSE Distribution Course |
| Research Apprenticeship | Research Apprenticeship |
| <u>Second Year: Additional Coursework for M.Phil.Ed.</u> | |
| Ed 771 Factor Analysis and Scale Development | Ed 871 Randomized Trials and Experiments |
| Ed 880 Complex, Multilevel, Longitud. Models Research Methods | Ed 881 Applied Multivariate Statistics |
| Ed 829(b) Policy Research Seminar | _____ Content Elective |
| _____ Optional Elective | _____ Optional Elective |
| Research Apprenticeship | Research Apprenticeship |

Research Apprenticeship: Inasmuch as M.Phil.Ed. degree students are preparing for careers in empirical research, primarily using quantitative methods, an integral part of the learning experience is the completion of an individually-tailored research apprenticeship arranged in consultation with the student's advisor. This arrangement will be by mutual agreement of the student, the student's

advisor, and perhaps an alternate faculty sponsor, as reviewed by the PREM faculty. Typically, the student will participate in significant aspects of faculty research in progress. The nature of the research apprenticeship will vary with the student's preparation and interests, the characteristics of the research, and the stage of the research. This experience involves a commitment of 6 hours per week for an academic year for full-time students (appropriate arrangements will be made for part-time students). The purpose is to provide the student with practical research experience on an ongoing basis during the course of

M.Phil.Ed. studies. The student may or may not be compensated for services rendered under the research apprenticeship, or might be compensated for part of the time. Performance in the research apprenticeship must be satisfactory, as certified by a student's academic advisor, as a condition for admission to Written Comprehensive Examination for the M.Phil.Ed. degree.

Independent Empirical Research Requirement: M.Phil. students satisfy the independent empirical research requirement by enrolling in Ed. 829(b), as described in detail in this PREM Program Description under Ed. 829(b) and the section entitled "Research Paper."

Written Comprehensive Examination: Toward the end of completion of course requirements, M.Phil.Ed. degree students are required to pass a written 3-hour comprehensive examination in the core content of the M.Phil.Ed. curriculum.

Doctor of Philosophy in Education (Ph.D.): Policy Research, Evaluation, and Measurement

The doctoral curriculum is oriented primarily to quantitative research, development, and applications in education and related social services fields. It is designed for researchers and scholars who aspire to develop and lead independent research projects and programs. At the doctoral level, opportunities for job placement following graduation include positions as directors in evaluation and analysis organizations, principal investigators of field studies, policy researchers and analysts, methodological consultants, measurement specialists and college and university professors. Doctoral graduates are employed in federal, state, and local government agencies; private corporations; schools, colleges and universities; health, mental health, and family services agencies; and professional organizations.

Doctoral degree studies in PREM includes advanced graduate coursework, a research apprenticeship, an independent empirical research paper, a Ph.D. Preliminary Examination, and completion of a doctoral dissertation that represents an independent and significant contribution to knowledge.

Coursework. Doctoral level studies emphasize research methodology and its application to policy. This entails advanced coursework in statistical methods, measurement, evaluation, and policy research, as well as concentrated coursework in at least one content area of education, the social sciences, or some related applied field. A minimum of 20 courses (post-baccalaureate) are required in the doctoral curriculum, 12 of which constitute the PREM core. Electives are selected

from both content areas and advanced methodological areas of education and social sciences to prepare students for sophisticated research on vital issues in public policy (see the sections that follow on Content Concentration and Cognate Electives for more detailed information). The PREM doctoral program of courses, apprenticeship, and dissertation is shown in Table 1. Doctoral students are required to complete the coursework and research apprenticeships for the M.S. and M.Phil. degrees, but may elect to complete, or not to complete, all other requirements for these master's degrees.

Research Apprenticeship: Doctoral students are provided an opportunity to serve as research apprentices with a faculty sponsor on an ongoing basis and to participate in field research leading to a dissertation. Sponsored research projects currently being conducted by program faculty members form the basis for much field work. The areas covered include mathematics and science achievement in international perspective, school restructuring, incentive systems, family violence, adjustment of children and adolescents, field experiments for evaluating social programs, information and observation systems on performance of institutions and individuals, behavioral measurement, peer tutoring, and teacher supply and demand (see the section that follows on the Research Apprenticeship for more detailed information).

Other Degree Components: See the sections that follow for detailed information about the Research Paper, the Preliminary Examination, Inquiry Skills, and Dissertation.

Table 1. PREM Curricula: M.S., M.Phil., and Ph.D.

| Fall Term | Spring Term |
|---|--|
| <u>M.S. (SMART)</u> | |
| Ed 625 Data Processing and Analysis | Ed 767 Regression and Analysis of Variance |
| Ed 684 Measurement and Assessment | Ed 768 Measurement Theory and Test Constr. |
| Ed 680 Evaluation of Policies & Programs | Ed 683 Survey Methods and Design |
| Ed 829 Policy Research Seminar | Ed ____ GSE Distribution Course (M.S./M.Phil.) Content Elective (Ph.D.) |
| Research Apprenticeship | Research Apprenticeship |
| <u>M.Phil. (PREM)</u> | |
| Ed 771 Factor Analysis and Scale Develop. | Ed 871 Randomized Trials and Experiments |
| Ed 880 Complex, Multilevel, Longitud Models | Ed 881 Applied Multivariate Statistics |
| Ed 829(b) Policy Research Seminar | _____ Content Elective |
| _____ Optional Elective | _____ Optional Elective |
| Research Apprenticeship | Research Apprenticeship |
| <u>Ph.D. (PREM)</u> | |
| _____ Cognate Elective (e.g., Soc. 612 Categorical. Data Analysis) | _____ Cognate Elective (e.g., Soc. 613 Event History Analysis) |
| _____ Cognate Elective (e.g., Stat. 915 Nonparametric Statistics) | _____ Content Elective |
| _____ Content Elective | _____ Content Elective |
| Research Apprenticeship | Research Apprenticeship |
| Dissertation | Dissertation |

M.S. Note: All 8 courses specified are required. In addition, Ed. 667 (Introduction to Statistics), or the equivalent, is required upon degree matriculation, or must be taken during the first term of study as a ninth CU for the M.S. degree.

PhD Note: All 20 courses specified for the M.S., M.Phil., and Ph.D. degrees, the research apprenticeships, and the dissertation are required for the PhD degree.

PREM METHODOLOGY COURSES

Ed 667. Introductory Statistics for Educational Research

Scales of measurement; indices of central tendency and variability; product-moment correlation; introduction to the chi-squared; Z, T, and F distributions. Prerequisite (or equivalent) to all other PREM courses.

Ed 625. Data Processing and Analysis

Construction, management, and transformation of computerized data files; basic treatments with major statistical software; outlier detection, data mining, and imputation; graphic representation for experiments, cartographic modeling, and research reports. Prerequisite or corequisite: Ed 667 or equivalent.

Ed 680. Evaluation of Policies, Programs, and Projects

Evaluation of contemporary practice and policy through the generation of statistical and literal evidence, and the design and implementation of evaluation using the case study method. Ed 667 may be taken concurrently with Ed 680.

Ed 683. Survey Methods and Design

Design of field surveys in education, the social sciences, criminal justice research, and other areas; methods of household mail and telephone surveys, methods of assuring privacy, enhancing cooperation rates, and related matters; fundamentals of statistical sampling and sample design. Much of the course is based on contemporary surveys sponsored by the National Center for Education Statistics and other federal, state, and local agencies.

Ed 684. Measurement and Assessment

Analysis of primary assessment concepts including psychometric theory, clinical and actuarial decision making, bias, and prediction; application of standards for educational and psychological tests and testing of aptitude, achievement, behavior, attitude, and personality. Prerequisite: Undergraduate statistics or tests and measurement.

Ed 767. Regression and Analysis of Variance

Analysis of survey data and controlled field experiments, including statistical models, hypothesis testing, experimental design, regression methods, and reporting. Prerequisite: Ed 667.

Ed 768. Measurement Theory and Test Construction

Design of ability, achievement, and performance measures such as those applied for high-stakes decision making in large-scale assessment and for diagnosis and classification of individuals; advanced true-score and item response theory; item formatting, analysis, selection, calibration, linking, and scaling; analysis of reliability for continuous, ordinal, nominal, and composite scales; analysis of differential item functioning; model contrasting, test equating, and scaling for longitudinal assessment; standards and cut-point setting. Prerequisite: Ed 684 or equivalent.

Ed 771. Factor Analysis and Scale Development

Advanced measurement theory; exploratory and confirmatory item factoring and clustering for self-report, observational, rating, performance, and personality instruments; scaling procedures, hierarchical structure, invariance, generality, reliability, validity, interpretation, and scientific reporting. Prerequisite: Ed 684 or equivalent.

Ed 871. Randomized Trials and Experiments.

Design and analysis of controlled experiments, including identifying and resolving scientific, managerial, ethical, political, institutional, legal, and statistical issues in the design, conduct and analysis of randomized trials for planning and evaluating programs, practices, and projects.

Ed 880. Complex, Multilevel, and Longitudinal Research Models

Design construction, sampling, internal and external validity principles; univariate and multivariate statistical treatment of experimental and quasi-experimental data; computer processing, interpretation, and reporting for simple and complex factorial, repeated measures, time series, growth trajectory, unbalanced, and multiple consistent and inconsistent covariates designs; error covariance structure modeling, hierarchical linear (and nonlinear) modeling, and multilevel individual growth-curve modeling. Prerequisite: Ed 767 or equivalent.

Ed 881. Applied Multivariate Statistics

Multivariate strategies for hypothesis testing, prediction, and classification, including multiple regression, multivariate multiple regression, canonical regression, multiple logistic regression, multiple discriminant functions, factor analysis of scaled variables, hierarchical cluster analysis, and multivariate classification analysis; computer processing, interpretation, and reporting. Prerequisite: Ed 880 or equivalent.

POLICY RESEARCH SEMINAR

Education 829

Introduction

Purposes

The Policy Research Seminar is designed to provide:

1. An introduction to the reciprocal relationships between scientific research and the development and assessment of contemporary educational and social policy,
2. Reading, discussion, and analysis of research reports on a variety of policy topics that illustrate various research methods, issues, and problems, and the relevance of research to policy development and assessment.
3. An occasional colloquium by a guest speaker on research on contemporary education policy or on social policy issues.

Organization

1. The seminar will meet every Wednesday during the fall term from 4:30 to 6:30 pm.
2. All PREM M.S. degree students are required to complete Part (a) of the seminar for credit during their masters studies at GSE. All PREM M.Phil. and Ph.D. degree students are required to complete both Parts (a) and (b) of the seminar for credit during their graduate studies at GSE.
3. The completion of (or concurrent enrollment in) Ed 667 (Introductory Statistics for Educational Research), or the equivalent, is prerequisite for enrollment and participation in Ed 829.
4. Presentations of reviews and analyses of published research, and of research projects (completed or in progress), relevant to policy issues will be made by PREM faculty members, PREM students, and guests from GSE and other institutions.

Seminar Content

1. Basic concepts and issues concerning the reciprocal relationships between scientific research and the policy development, implementation, and assessment process in education and other social service fields: Students will be introduced to this topic through lectures and discussion. In addition, a textbook might be required, and students are responsible for mastering a reasonably extensive reading list assembled by PREM faculty members.

2. Illustrations and analyses of policy research: Students and faculty will learn about the content of a wide variety of policy research topics through seminar presentations by faculty members, expert guest lectures, and students. A reading list of pertinent literature is often distributed in advance of each topic presented, and seminar participants should read, in advance of a presentation, at least one key paper designated by the lecturer. Ordinarily, a copy of the key paper will be provided to seminar participants by the course instructor.

Prerequisite or corequisite: Ed 667 or equivalent

Part (a)

(Revised Effective for Students Enrolling During the Fall Term 2002 and Thereafter)

In addition to regular attendance and participation in the Policy Research Seminar, each student enrolled for course credit in Part (a) is required to:

1. Submit one term paper of substance and quality. This paper shall be an original review and analysis of research on a significant contemporary topic in education policy or in social policy.
2. Make a presentation to the Seminar of approximately one hour that ordinarily will be based on the term paper, although it could be on some other topic selected in consultation with the instructor.

The required term paper, and the oral presentation based thereon, shall constitute the basis for the final mark in Part (a) of the Policy Research Seminar for students enrolled for credit. The instructor of record for Part (a) of the Seminar is responsible for reading the required term paper, and for assigning the final marks for the course. The 829 instructor may collaborate with a student's advisor in reading and marking the term paper.

As with other courses, questions related to the content of the policy seminar (including the reading list) might appear on the masters' major examination and the doctoral preliminary examination.

Part (b)

(Effective for Doctoral Students Enrolling During the Fall Term 1999 and Thereafter)

Enrollment in Part (a) of Education 829 is prerequisite for enrollment in Part (b).

PREM M.Phil. and Ph.D. enroll in Part (b) of Education 829 for credit. Part (b) is a continuation of Part (a) with respect to Purposes, Organization, and Seminar Content (as specified above in the Introduction).

Each student enrolled for course credit in Part (b) will complete the PREM "Research Paper" requirement under the supervision of an appropriate faculty member or other scholar selected in consultation among the student, the instructor of record for Education 829, and the prospective sponsor. The sponsor selected to supervise work leading to an acceptable Research Paper will sometimes be the student's faculty advisor, but is often some other Penn faculty member and occasionally a qualified research scholar off-campus. For more detailed information about the Research Paper requirement for PREM M.Phil. and Ph.D. students, see the relevant section below in Pages 15-16.

The final mark for Part (b) of Education 829 will be based on the student's Research Paper that must be acceptable to the research sponsor and to the instructor of record for Education 829.

CONTENT CONCENTRATION (4 CUs): FOR PREM Ph.D. STUDENTS

Each doctoral student is expected to select an area in education, or possibly in a related field or academic discipline, in which to develop a content concentration underlying the student's own policy research. The following examples illustrate various policy research foci with associated content concentrations:

1. Study of state policies on science instruction at the elementary education level: A minimum of 4 courses in science education and elementary education would constitute the content concentration relevant to this topic.
2. Study of higher education policies on scholarships vs. loans for supporting undergraduate students: A minimum of 4 courses in higher education, especially in student financial assistance and higher education finance.
3. Study of New York state policies on bilingual education: A minimum of 4 courses in educational linguistics (especially in bilingual education, second language acquisition, and TESOL).
4. Study of federal welfare reform policy: A minimum of 4 courses in sociology and social work would constitute the content concentration relevant to this topic.

COGNATE ELECTIVES (3 CUs): FOR PREM Ph.D. STUDENTS

Each doctoral student is expected to develop, in collaboration with her advisor, a group of elective courses selected in such a way as to strengthen substantially the student's preparation for the type of research in which she is developing special expertise. The following examples illustrate various policy research foci with associated cognate elective courses that may be found within GSE or in other departments of the University:

1. Study of policy issues with large existing data bases using advanced quantitative methods. The student developing expertise in this type of research should enroll in advanced courses on such topics as survey research sampling theory, statistical analyses of data from structured surveys, hierarchical linear modeling, mass data processing, or computer programming.
2. Study of implementation and operation of policy-driven programs at the practitioner level. The student should enroll in courses on such topics as program implementation; educational technology; data gathering in field settings such as survey questionnaire, interview, and ethnographic methods; or analysis of observational data.
3. Analysis of public policy in relation to relevant knowledge. The student enroll in courses on such topics as public policy analysis, decision sciences, the use of information in institutional and political settings, communications, planning, and in courses whose contents have a direct bearing on the student's substantive policy interests, such as surveys of education policy and economic policy.
4. Study of policy effectiveness. The student should enroll in courses on such topics as policy and program analysis, controlled field experiments and quasi-experiments, linear statistical modeling, logistic modeling, survey sampling and survey methods, and time-series analysis.

RESEARCH PAPER: FOR PREM M.Phil. and Ph.D. STUDENTS

Revised: January 3, 2006

In addition to course and apprenticeship requirements, each PREM M.Phil. and Ph.D. student must submit a high-quality original research paper. This paper should be of sufficiently high quality to be published in a scholarly journal or to be the substantial basis for such a published paper. Registration for the Ph.D. preliminary examination by a PREM doctoral student is contingent upon satisfactory completion of the research paper.

To meet this requirement, M.Phil. and Ph.D. students first register for Part (b) of Ed 829, as described above. Students may elect (a) to build on papers that they have developed as part of their coursework, (b) to develop and report on work undertaken in their research apprenticeships, or (c) to develop new independent research conducted in collaboration with, or under the supervision of, their faculty adviser or other faculty sponsor.

The research paper should be based on empirical field work or other original empirical research. Ordinarily, it will focus on a topic drawn from the student's area of content concentration. It may use or develop new methods of generating evidence needed in policy analysis and decisions, and may consider new approaches to enhancing the use of high quality evidence. Regardless of its general focus, the paper is expected to meet high scholarly and professional standards. Such standards are explicit or implicit in coursework.

Procedures and timetable for completing the Research Paper requirement are as follows:

1. Students register for Part (b) of Ed 829.
2. In consultation with the instructor of record for Ed 829, students identify a research topic or problem, and secure the commitment of a faculty member to sponsor and supervise the work leading to a satisfactory research paper.
3. Students prepare a written proposal for the research project which will include a review of the research, theoretical, and applied background for the research, a statement of the research problem and its significance, and the methods to be used in conducting the research. Upon approval by the faculty sponsor, the proposal should be transmitted to the instructor of record for Ed 829 for inclusion in the instructor's file for this course.
4. After the faculty sponsor has approved the student's research proposal and it has been transmitted to the instructor of record for Ed 829, the student should proceed to conduct the research project in accordance with the approved proposal and under the supervision of the sponsor.
5. Upon completion of the research project, students are expected to write a report of the research in a format that meets the specifications of the APA Publication Manual.

6. Upon completion of a research report that is satisfactory to the student's faculty sponsor, the faculty sponsor should transmit a copy of the paper to the instructor of record for Ed 829 along with a recommended letter grade for the paper.

7. Students and their faculty sponsors may work at a pace on the research paper that is mutually agreeable and appropriate to the project. However, students must submit a final draft of the research paper to their faculty sponsor at least one month prior to the deadline date for registering for the administration of the preliminary examination for which the student wishes to sit. In turn, the faculty sponsor is obligated to inform the instructor of record for Ed 829 by the deadline date for registration for the preliminary examination of whether the research report is satisfactory to meet this degree requirement. If it is satisfactory in the judgements of the both the faculty sponsor and the instructor of record for Ed 829, the student has fulfilled the research paper requirement and is eligible to register for the preliminary examination insofar as this requirement is concerned.

RESEARCH APPRENTICESHIP: FOR PREM Ph.D. STUDENTS

All PREM doctoral students are required to serve as research apprentices for a minimum of 6 hours per week for 4 terms with their faculty advisors, or some other University faculty member by mutual agreement of the student, the student's advisor, and the alternate faculty sponsor. Ordinarily, the student will participate in significant aspects of the faculty sponsor's research in progress. The nature of the participation will vary with the student's preparation, the characteristics of the research, and the stage of the research. The purpose is to provide the student with practical research experience on an ongoing basis during the course of doctoral studies and at least one opportunity to develop and undertake the lead responsibility for some aspect of the research culminating in the student's research paper.

The research apprenticeship requirement does not entail enrollment in any course or tuition cost. Students may or may not be compensated for services rendered under the apprenticeship requirement, or might be compensated for part of the time. The unavailability of compensation does not render the requirement void. Compensation might come in forms such as scholarship and fellowship awards, or as part-time salary at standard GSE hourly rates. It is expected that many students will function in the research apprentice role from one to two days per week, with compensation for much of or all of this time.

PRELIMINARY EXAMINATION: FOR Ph.D. STUDENTS

The preliminary examination is ordinarily taken close to the end of a student's program of doctoral study, but before the student's dissertation committee is formally appointed. This examination is a test of knowledge in (a) the basic content of PREM as represented by the advanced courses offered by PREM faculty members, and (b) the specialized knowledge a student has mastered in her area of content concentration and cognate electives. The examination is given in two 3-hour sessions

on one day, with the first 3-hour session devoted to a general examination in PREM, and the second 3-hour session devoted to examination in the student's particular content and cognate areas.

INQUIRY SKILLS

Each master's and doctoral student is expected to develop whatever inquiry skills may be needed to execute their research. Such skills may include computer-based literature search, use of common statistical software packages such as SAS, fluency in a foreign language, computer programming, etc.

Short courses (two days or less) that introduce several important topics are offered regularly in various parts of the University. For instance, a 2-day workshop on SAS is offered annually by Social Sciences Computing, and the Van Pelt Library offers instruction in learning computer-based literature searches.

TRANSFER OF CREDIT: FOR M.Phil. and Ph.D. STUDENTS

Transfer of credit from graduate study completed elsewhere to the PREM M.Phil. and Ph.D. curricula is possible, but not automatic. Student applications for transfer of credit of specific courses will be considered for approval under the following conditions:

1. The course is a close approximation in content, quality, and level to one of the relevant required PREM courses,
2. The course was recently completed, and
3. The total number of external courses that can be approved for transfer of credit is limited to 4 CUs of the 14 CUs required for the M.Phil. at Penn (i.e., the minimum 8 CU for the M.S. plus the additional minimum 6 CU for the M.Phil.), and is limited 8 CUs for the Ph.D.

DISSERTATION: FOR PREM Ph.D. STUDENTS

As the culminating step in doctoral study, PREM students are expected to complete a dissertation that represents a significant contribution to general knowledge. The dissertation is to be based on the student's independent empirical research including the identification of a significant research problem, review and analysis of relevant scholarly literature, design of research and data analysis methods, interpretation of results, and the framing of conclusions about implications for policy, practice, and/or theory.

All phases of the dissertation research must represent the student's independent work, including the literature review, the conduct of all statistical analyses, and the writing of the dissertation manuscript. The dissertation research should follow the research plan approved by the student's Dissertation Committee (including approved changes thereto). The student is solely responsible (a) for the quality and integrity of the research, (b) for the oral defense of the research before the Dissertation Committee, and (c) for complying with all GSE and Penn dissertation requirements, including timelines for completion of doctoral study and the submission of paperwork required for graduation.

ADMISSIONS

The applicant must meet the general requirements of the University of Pennsylvania and the Graduate School of Education. Applications for admission must include GRE scores, 3 letters of recommendation, and an essay on the applicant's academic and career interests and plans.