William Paterson University
College of Education
Department of Elementary and Early Childhood Education

COURSE OF STUDY

Theme: Preparing Inquiring Educators: Knowledge, Understanding, Application

1. **Course Title and Credits:** ELCL 628  Mathematics Education Research Seminar
   3 graduate credits

2. **Course Description:**
   This course focuses on the examination and critique of existing published studies in the field of mathematics education and on the development of research paradigms in this field. Classroom research projects and methods for assessing the effects of curricular change on students, teachers, and school structures are emphasized. National and state standards for teaching mathematics are examined from the perspective of research methods and empirical outcomes.

3. **Pre-requisite:** None specified (required for the Teaching Children Mathematics concentration of M.Ed. in Education program)

4. **Course Objectives:**
   1. Identification and analysis of current issues and trends in research in mathematics education in light of national, international, and state content standards for mathematics education.
   2. Identification and evaluation of innovative mathematics education practices being implemented locally in the state, nationally and internationally across the mathematics curriculum.
   3. Development of a knowledge base for conducting empirical investigations in mathematics education.
   4. Analysis, interpretation, and application a variety of assessment techniques, including the use of statistical evidence, in the service of educational research.
   5. Formulation of a set of preliminary ideas for an individual research project to be followed up in CIEE 629, Research in Education I.

5. **Student Learning Outcomes:**
   Students will:
   1. be able to describe the major current research issues and paradigms in mathematics education
   2. conduct an examination of the scope of the field through critical analysis of research evidence using library resources
   3. produce an in-depth critique and synthesis of existing studies in a specific research area within the mathematics education field
   4. develop an annotated bibliography and research summary that will guide them in their formulation of a research problem to be addressed in a master’s thesis
6. **Course Content:**
   A. Overview of Research in Mathematics Education
      1. Examination of evolving trends and common threads in approaches to mathematics education from the vantage points of historical and current practices
   B. Critiquing the Literature/Comparing Levels of Research Publications
      1. Distinguishing between how-to articles, opinion pieces, and empirical research studies
   C. Broad Categories of Research Paradigms in Mathematics Education
      1. Examination of formats and data sources for conducting empirical research in mathematics education (e.g., experimental and quasi-experimental designs, ethnographic approaches, action research paradigms, case study methods)
   D. Identifying researchable problems in mathematics education:
      1. Using ERIC to generate a search
   E. In-depth exploration of research on particular issues and state curricular content standards and reforms in mathematics education including:
      1. the impact of "constructivist teaching" practices
      2. the impact of expanded instructional formats (e.g., problem solving, cooperative learning, talking and writing about mathematics, manipulative materials, technology)
      3. the impact of teaching new strands of mathematics content (e.g., number sense, estimation, mental calculation, number theory, patterns and functions, geometry, probability and statistics)
      4. the effects of changing assessment formats (e.g., portfolio assessment, scoring rubrics, informal assessments)
      5. equity issues in mathematics education research (e.g., gender, race, culture, language minority students, tracking and ability grouping)
      6. research on students' characteristics (e.g., learning styles, children's misconceptions, motivational issues, social and emotional factors)
      7. research on teachers' beliefs and practices
   F. Collection of published research within a specialization area
   G. Production of a summary of the literature
   H. Sharing of summaries of the literature within specific areas of the field.
   I. Development of an individual classroom research agenda leading to a researchable issue for a master's thesis (to be developed further in CIEE 629, Research in Education I).

7. **Teaching/Learning Methods:**
   1. Assigned readings related to syllabus topics
   2. Lecture and discussion
   3. Presentations by students
   4. Cooperative group learning experiences
   5. Active research in the library

8. **Evaluation Methods:**
   A. written critique and comparison of three assigned articles on the same research topic
   B. written annotated bibliography of a researchable topic in mathematics education
C. written report of the research findings on a particular topic in mathematics education leading to a researchable problem for a master’s thesis (to be followed up in CIEE 629, Research in Education I)
D. small group presentation of the research evaluated on a particular topic in mathematics education

9. **Recommended Texts/Readings:**
   Selected articles from a variety of research journals in the field (e.g., the following):

10. **Preparer’s Name and Date:** Professor Rochelle G. Kaplan, Fall 1996

11. **Department Approval Date:** Spring 1997

12. **Reviser’s Name and Date:** Rochelle G. Kaplan, updated Spring 2000; Fall 2002

13. **Department Revision Approval Date:** Spring 2000

14. **Bibliography:**


*Educational Studies in Mathematics*, issues from 1995-present

*Focus on Learning Problems in Mathematics*, issues from 1990-present

*For the Learning of Mathematics*, issues from 1990-present.


*The Journal of Mathematical Behavior*, issues from 1990 to present.

*The Journal for Research in Mathematics Education*, issues from 1990-present


*Mathematics in the Middle School*, issues from 1994 to present.

*The Mathematics Teacher*, issues from 1990 to the present.


New Jersey Core Curriculum Content Standards for Mathematics (revised 2002).


*Teaching Children Mathematics*, issues from 1994 to present.


