Theme- Preparing Inquiring Educators: Knowledge, Understanding, Application

1. **Course Title and Credits**: ELCL 613 Mathematics for Young Children  
   3 graduate credits

2. **Course Description**:  
The purpose of this course is to increase teachers’ competence in planning, conducting, and assessing mathematics learning experiences with children from preschool through the early grades of elementary education. The course makes extensive use of direct observation and video lab experiences in addition to relevant readings to enable teachers to interpret young children’s mathematical behavior in meaningful ways. It considers mathematical thinking as part of a developmental process and explores the origins of young students’ mathematical ideas in natural as well as formal school settings. The content of the course follows the recommendations for mathematics standards developed by NCTM and those in the position paper jointly authored by NAEYC and NCTM. It is expected that teachers who complete this course will be able to function as advanced practitioners and staff developers of colleagues who teach mathematics to younger students.

3. **Prerequisites**: This course is open to matriculated master’s degree students and post-masters degree students.

4. **Course Objectives**:  
   A. Identification of the mathematics in young children’s spontaneous behavior  
   B. Accurate observation and interpretation of young children’s spontaneous knowledge and thinking about mathematics  
   C. Analysis of the conceptual and procedural underpinnings of the mathematics that young students know and can learn  
   D. Assessment of the mathematics knowledge of young students using informal techniques  
   E. Examination of young students’ mathematics abilities and potential in the context of current curriculum standards  
   F. Exploration of methods of teaching mathematics to younger students by connecting spontaneous knowledge to the big ideas of conventional mathematics  
   G. Exploration of methods of teaching mathematics to younger students in the context of learning experiences in other subject areas  
   H. Techniques for becoming curriculum leaders and staff developers for promoting developmentally appropriate mathematics learning experiences for young students

5. **Student Learning Outcomes**:  
Students will be able to:
A. identify the mathematics in young children’s spontaneous behavior both through direct observation and through analysis of videotape examples
B. report on their observations and interpretations of young children’s spontaneous knowledge and thinking about mathematics
C. analyze the conceptual and procedural underpinnings of the mathematics that young students know and can learn through online and in-class discussions
D. report on their own assessments of the mathematics knowledge of young students using informal techniques such as clinical interviewing
E. articulate in formal lesson plans how young students’ mathematics abilities and potential fit in the context of current curriculum standards
F. teach and assess the effects of teaching mathematics to young students by connecting spontaneous knowledge to the big ideas of conventional mathematics
G. teach and assess the effects of teaching mathematics to young students in the context of learning experiences in other subject areas
H. plan a staff development project to evidence their competence as curriculum leaders and staff developers for promoting developmentally appropriate mathematics learning experiences for younger students.

6. **Course Content**
A. Overview of origins of children’s mathematical thinking
B. Mathematics in everyday life- at school and at home
   1) Counting
   2) Number magnitude and equivalence relations
   3) Shapes, spatial relations, and measurement
   4) Patterns and logical reasoning
   5) Problem solving
C. Assessing mathematical competence in the context of naturally occurring learning contexts in the classroom
D. Looking for connections between informal and formal mathematics
E. Content standards for teaching, learning, and assessing mathematics in younger students
   1) Number and operations
   2) Patterns and relations
   3) Geometry and spatial reasoning
   4) Measurement
   5) Making sense of data
F. Methods of teaching mathematics as a subject area
   1) Problem solving as a method of instruction
   2) Reasoning and proof or reasoning
   3) Communicating with words and pictures
   4) Making connections within mathematics and between mathematics and other areas
G. Integrating mathematics into the general curriculum
   1) Links with language arts
   2) Links with visual arts
   3) Links with music and rhythm
   4) Links with science
   5) Links with social studies
H. Assessing learning in the classroom
I. Working with parents to encourage mathematical ideas
J. Working with other teachers as staff developers in younger students’ mathematics learning

7. **Teaching/Learning Methods**
   A. Assigned readings related to syllabus topics
   B. Independent analysis of videotaped case studies using distance learning format
   C. In-class analysis of videotaped case studies
   D. Behavioral observations and interpretations
   E. Lesson planning, implementation, and reflection
   F. Staff development and parent education role playing activities

8. **Evaluation Methods**
   A. Participation in class discussions and videotape case analyses
   B. Participation in distance learning experiences and videotape case exercises
   C. Reports on direct observations and videotape observations of children’s mathematical behavior
   D. Subject specific and integrated lesson plan constructions
   E. Action research project involving implementation of lessons plans followed by reflective analysis of the plans impact on children’s learning
   F. Staff development and parent education plan

9. **Recommended Texts**
   Excerpts from psychological research and critical position papers on young children’s mathematical thinking as well as selected chapters from books related to mathematics curricular activities for young children. The readings should include, but not be limited to the following:


10. **Preparer’s Name and Date:** Professor Rochelle Goldberg Kaplan, Fall 2003
11. **Department’s Approval Date:** Fall 2003

12. **Reviser’s Name and Date:**

13. **Department’s Approval Date for Revisions:**

14. **Bibliography**


