_____ _____ Form C--Subject Area Audit
Student's Name Student's ID# Graduate Program Revised Fall 2000

MATHEMATICS ENDORSEMENT

The goals of mathematics education are to enable the student to demonstrate an understanding of mathematics processes, perspectives, and ideas in the content areas including number systems, geometry and measurement, statistics and probability, functions and algebra, and discrete mathematics. Becoming a teacher is a lifelong undertaking that is initiated in college course work, refined in field experiences, and enhanced during professional practice. The course work and related field and laboratory experiences will provide the prospective teacher the knowledge and skills to accomplish the following:

I. Mathematical Processes and Perspectives

_____ A. Use problem solving approaches to help students investigate and understand mathematics_____

_____ B. Use a variety of manipulatives and visual materials to facilitate students' exploration and development of mathematical concepts._____

_____ C. Use graphing calculators, computers and other technologies as tools for teaching mathematics._____

_____ D. Communicate mathematics ideas orally and in writing, using everyday and mathematical language, including symbols._____

_____ E. Use teacher-to-teacher, teacher-to-student, and student-to-student discourse to extend mathematical understanding._____

_____ F. Create an effective learning environment employing multiple teaching strategies in which students feel free to take risks._____

_____ G. Make and evaluate mathematical conjectures and arguments to validate mathematical thinking _____

_____ H. Use a variety of methods aligned with instructional techniques to assess mathematical thinking._____ _____

_____ I. Show an understanding of interrelationships within mathematics; connect mathematics to other disciplines and real-world situations so that students will appreciate the significant role that mathematics plays in their lives. _____

_____ J. Know the historical development, notations, and terminology of algebras, geometries, and the calculus._____

_____ K. Understand the diverse cultural heritage and dynamic nature of mathematics including recent developments._____

II. Number Sense, Systems and Theory

_____ A. Demonstrate number sense, including a sense of magnitude, mental mathematics, estimation place value, and a sense of the reasonableness of results. _____

_____ B. Represent and use numbers in a variety of equivalent forms, including integers, fractions, decimals, percent, and exponential and scientific notation.__ _____

_____ C. Know computational procedures, including common and uncommon algorithms, mental strategies, use of manipulatives and other representations, technology, and paper and pencil._____

_____ D. Know algebraic properties of number systems._____

_____ E. Understand number theory at appropriate levels from abstract and concrete perspectives. _____

_____ F. Apply the above to real world models and applications_____

III. Geometry and Measurement

_____ A. Understand shapes and use spatial reasoning._____ _____

_____ B. Use geometric models to represent, visualize and solve problems._____

_____ C. Estimate and use direct and indirect measurements and formulas to describe and compare geometric phenomena._____

_____ D. Understand systems of geometry, including Euclidean, non-Euclidean, coordinate, transformational, and projective geometry, from both the synthetic and analytical points of view. _____

_____ E. Reason on an abstract level, make and test conjectures, and explore theorems. _____

IV. Statistics and Probability

_____ A. Collect, represent, analyze and interpret data. _____

_____ B. Use data to formulate and test hypotheses, draw conclusions, and make convincing arguments_____

_____ C. Use descriptive and inferential statistics to model real world situations and to understand the role played by statistics and probability in social, political and economic processes._____

_____ D. Determine experimental probabilities by devising and carrying out experiments or simulations._____

_____ E. Determine theoretical probability by constructing a sample space._____

_____ F. Use probability as a way to describe chance or risk in simple and compound events._____

V. Functions, Algebra and Concepts of Calculus

_____ A. Describe, extend, analyze and create a wide variety of patterns to develop the concept of a function and its role in algebra._____

_____ B. Model and solve problems using algebraic methods employing manipulatives and technology as appropriate. _____

_____ C. Understand the concepts of limit, continuity, differentiation and integration and how they relate to the calculus._____

_____ D. Apply the concepts and techniques of calculus to the analysis of functions and graphs of functions._____

_____ E. Apply the basic theory of linear algebra, calculus of vectors, and linear transformations._____

VI. Discrete Mathematics

_____ A. Apply counting techniques to collect and organize information and solve problems._____

_____ B. Understand symbolic ._____

_____ C. Model real world problems using graph theory, linear programming and matrices._____

_____ D. Develop and analyze algorithms including iterative and recursive techniques._____

COMMENTS:_____

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DEFICIENCIES:_____

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ADVISER APPROVAL:

_____

Date

This audit should accompany FORM A (blue undergraduate liberal arts audit) and FORM B (yellow graduate-level audit). After the adviser has approved all three audit forms, they should be sent to the Director of Teacher Licensure, 305 Wyatt Center, for final processing. Approved audits will be copied and sent to the adviser and the student.

GUIDELINES FOR MATHEMATICS ENDORSEMENT

I. Each Peabody teacher education student is required to file a program of studies (undergraduate) or audit form (graduate) to itemize the required courses and field work to acquire knowledge and skills specified for the mathematics 7-12 endorsement. Prior to licensure recommendation, each program of studies and audit form is analyzed to verify completion.

II. Both undergraduate and graduate programs require study in human development and instructional knowledge and skills applicable to both middle and high school levels.

III. Teacher candidates for the mathematics 7-12 endorsement experience teaching in both middle and high school classrooms.

IV. Candidates for the mathematics 7-12 endorsement are experienced with graphing calculators, computers and other technologies, manipulatives, and visual materials as tools for teaching mathematics.